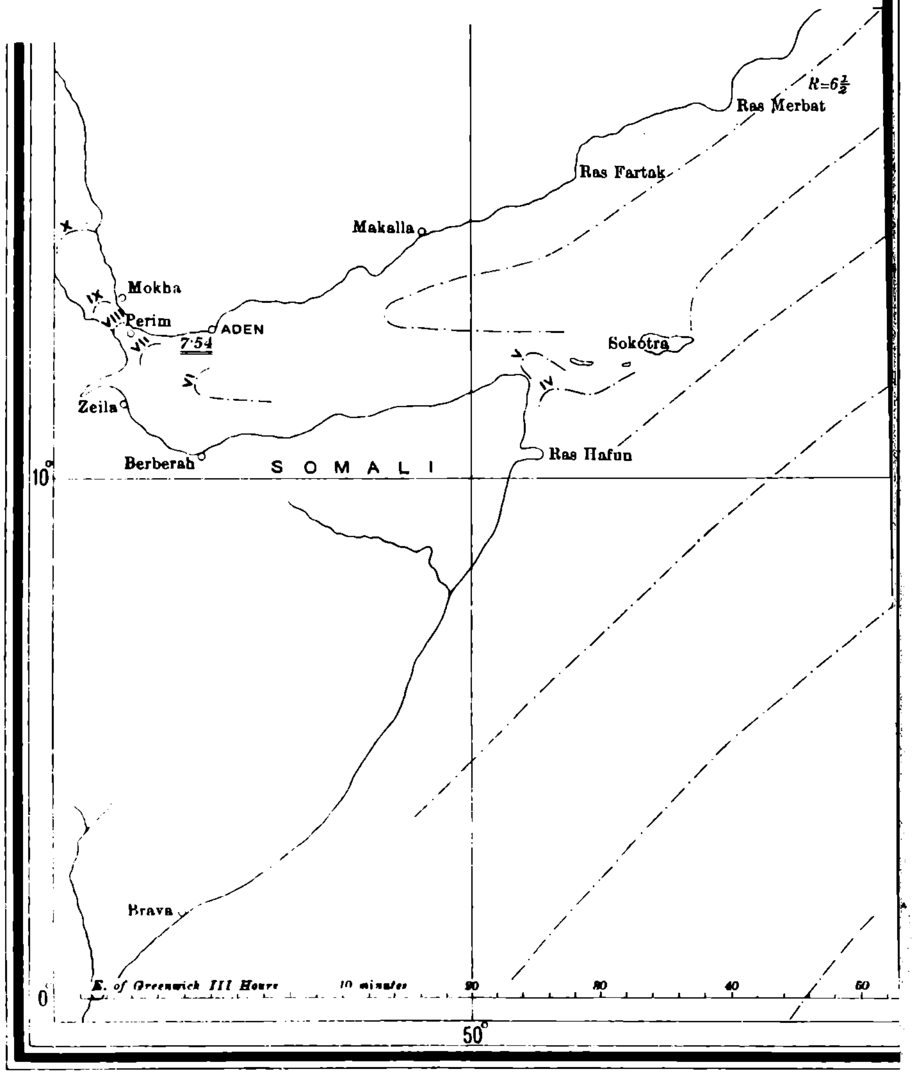
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ACCOUNT OF THE OPERATIONS OF THE

GREAT TRIGONOMETRICAL SURVEY OF INDIA

VOLUME XVI.

DETAILS

OF

THE TIDAL OBSERVATIONS

TAKEN DURING THE PERIOD FROM 1873 TO 1892

AND

A DESCRIPTION OF THE

METHODS OF REDUCTION

BY

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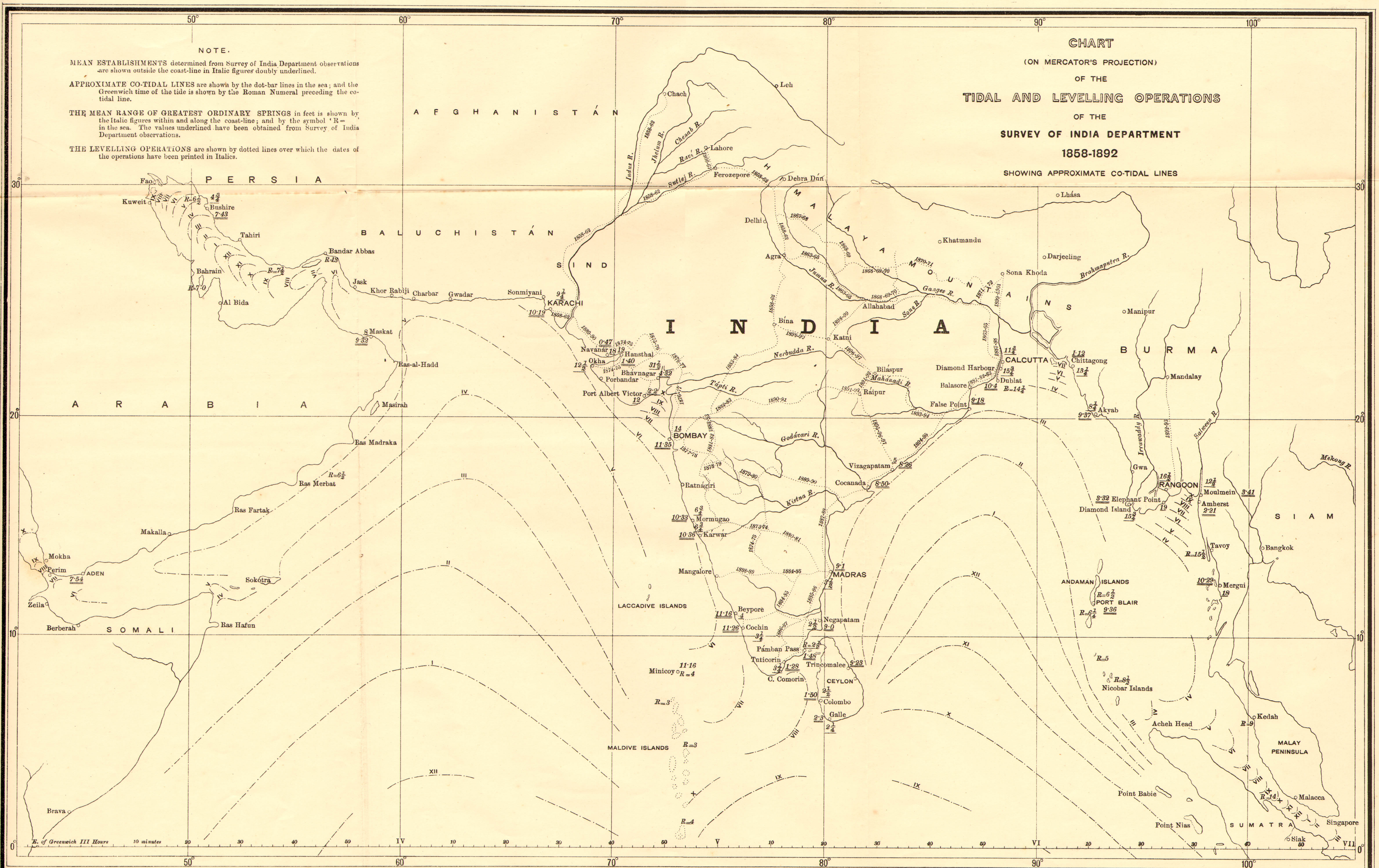

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PREFACE.

The present volume—the sixteenth—of the *Account of the Operations of the Great Trigonometrical Survey of India,* is devoted to the Indian Tidal Observations, and has been written and arranged by Mr. John Eccles, M.A.

The observations, with which this volume deals, were taken during the period from 1873 to 1892: the printing and preparation of the volume have been protracted over a longer time than was anticipated, owing to the stock of type at the Survey Office in Dehra Dún being very limited.

Tidal Observations were originally commenced in India with a view to investigating the secular changes, which were believed to be occurring, more particularly on the coast of Káthiáwár, in the relative level of land and sea. About the same time as the question of these secular changes was raised in India, a committee of the British Association for the Advancement of Science—presided over by Sir William Thomson—initiated a system of tidal investigations, which it was anticipated would secure scientific results of the highest value. Colonel J. T. Walker, R.E., F.R.S., recommended to the Government of India, that the committee's system should be followed, pointing out that, if this were done, the results would not only serve the purpose for which they were originally contemplated, but would materially contribute towards the attainment of a better knowledge of the laws of tides, which it was expected would lead to an evaluation of the mass of the moon, to information regarding the rigidity of the earth, to an approximation of the depth of the sea from the observed velocities of tide-waves, to the retardation of the earth's rotation due to tidal friction, and to various practical benefits accruing to navigation from accurate predictions of the height of the tide at any given time, and the publication of Tide Tables.

The officer selected by Colonel Walker to take charge of the Indian Tidal Operations was Lieutenant A. W. Baird, R.E., (now Colonel A. W. Baird, C.S.I., R.E., F.R.S.). Lieutenant Baird was deputed to Europe to study the practical details of the method of tidal registration and of the harmonic analysis of observations. On his return to India in 1877 he opened the first tidal observatories and trained the original staff of observers and computers. He remained in charge of the Indian Tidal work until 1886, when he was appointed Master of Her Majesty's Mint at Calcutta. The methods of observation and computation introduced by Lieutenant Baird have been continued without modification to the present day.

Colonel Baird's successor was Colonel John Hill, R.E., who held charge of the Indian Tidal Operations from 1886 to the date of his retirement from the service of Government in 1895.

On three occasions, namely in 1881, 1882 and 1888 during the absence of Colonels Baird and Hill, the control of the Tidal work devolved on Colonel Malcolm W. Rogers, R.E., afterwards Assistant Surveyor General at Calcutta.

From 1873 to 1885 Mr. T. H. Rendell was the Tidal Assistant for the inspection of observatories. He was succeeded in 1885 by Mr. G. P. Belcham, who retained this post until his retirement in 1900.

In 1877 Mr. E. J. Connor was appointed to supervise the Tidal computations, and this important duty he has continued to perform until the present date, 1901.

The tidal observatories with which this volume deals are:—

	Site of Observatory	Years of Observation
1.	Aden	1879 to 1892 = 13 years
2.	Kurrachee (Karachi)	1881 „ 1892 = 11 „
3.	Navánár	1874 „ 1875 = 1 year
4.	Hansthal Point	1874 „ 1875 = 1 „
5.	Okha Point and Bet Harbour	1874 „ 1875 = 1 „
6.	Port Albert Victor (Káthiwadar)	1881 „ 1882 = 1 „
7.	Bhávnagar	1889 „ 1892 = 3 years
8.	Bombay (Apollo Bandar)	1878 „ 1892 = 14 „
9.	Bombay (Prince's Dock)	1888 „ 1892 = 4 „
10.	Marmugáo (Goa)	1884 „ 1889 = 5 „
11.	Kárwár	1878 „ 1883 = 5 „
12.	Beypore	1878 „ 1884 = 6 „
13.	Cochin	1886 „ 1892 = 6 „
14.	Tuticorin	1888 „ 1892 = 4 „
15.	Minicoy	1891 „ 1892 = 1 year
16.	Galle	1884 „ 1890 = 6 years
17.	Colombo	1884 „ 1890 = 6 „
18.	Trincomalee	1890 „ 1892 = 2 „
19.	Pámban Pass	1878 „ 1882 = 4 „
20.	Negapatam	1881 „ 1888 = 6 „ *
21.	Madras	1880 „ 1890 = 10 „
22.	Cocanada	1886 „ 1891 = 5 „
23.	Vizagapatam	1879 „ 1885 = 6 „
24.	False Point	1881 „ 1885 = 4 „
25.	Dublat (Saugor Island)	1881 „ 1886 = 5 „
26.	Diamond Harbour	1881 „ 1886 = 5 „
27.	Kidderpore (Calcutta)	1881 „ 1892 = 11 „
28.	Chittagong	1886 „ 1891 = 5 „
29.	Akyab	1887 „ 1892 = 5 „
30.	Elephant Point, Open Coast Station (at Old Site) ...	1880 „ 1881 = 1 year
30A.	Elephant Point, Riverain Station (at New Site) ...	1884 „ 1888 = 5 years
31.	Rangoon	1880 „ 1892 = 12 „
32.	Amherst	1880 „ 1886 = 6 „
33.	Moulmein	1880 „ 1886 = 6 „
34.	Mergui	1889 „ 1892 = 3 „
35.	Port Blair	1880 „ 1892 = 12 „

* The year 1884-85 has been excluded.

Since this volume was written in 1892, new tidal observatories have been opened, mostly at the advice of Professor G. H. Darwin, F.R.S. Observations taken at Indian observatories, subsequent to the year 1892, will be recorded in a future volume of this series. In the following table is given a complete list of all Indian tidal observatories with the periods of observation.

Site of Observatory	Automatic or Personal Observations	Date of Commencement of Observations	Date of Closing of Observations	Number of Years of Observations	REMARKS
1. Suez	Automatic	1897	Still working	3	
2. Perim	Do.	1898	Do.	2	
3. Aden	Do.	1879	Do.	20	
4. Maskat	Do.	1893	1898	5	
5. Bushire	Do.	1892	Still working	7	
6. Kurrachee (Karachi)	Do.	1881	Do.	19	
7. Hansthal	Do.	1874	1875	1	
8. Naváuár	Do.	1874	1875	1	
9. Okha Point	Do.	1874	1875	1	
10. Porbandar	Personal	1893	1894	2	
10A. Porbandar	Automatic	1898	Still working	2	
11. Port Albert Victor (Káthiwadar) ...	Personal	1881	1882	1	
11A. Port Albert Victor (Káthiwadar) ...	Automatic	1900	Still working	...	
12. Bhávnagar...	Do.	1889	1894	5	
13. Bombay (Apollo Bandar) ...	Do.	1878	Still working	22	
14. Bombay (Prince's Dock) ...	Do.	1888	Do.	12	
15. Mormugáo (Goa)	Do.	1884	1889	5	
16. Kárwár	Do.	1878	1883	5	
17. Beypore	Do.	1878	1884	6	
18. Cochin	Do.	1886	1892	6	
19. Tuticorin	Do.	1888	1893	5	
20. Minicoy	Do.	1891	1896	5	
21. Galle	Do.	1884	1890	6	
22. Colombo	Do.	1884	1890	6	
23. Trincomalee	Do.	1890	1896	6	
24. Pámban Pass	Do.	1878	1882	4	
25. Negapatam	Do.	1881	1888	6	The year 1884-85 has been excluded.
26. Madras	Do.	1880	1890	10 } 15	
		Re-started			
		1895	Still working	5	
27. Cocanada	Do.	1886	1891	5	
28. Vizagapatam	Do.	1879	1885	6	
29. False Point	Do.	1881	1885	4	
30. Dublat (Saugor Island) ...	Do.	1881	1886	5	
31. Diamond Harbour	Do.	1881	1886	5	
32. Kidderpore	Do.	1881	Still working	19	
33. Chittagong	Do.	1886	1891	5	
34. Akyab	Do.	1887	1892	5	
35. Diamond Island	Do.	1895	1899	5	
36. Elephant Point	Do.	1880	1881	1 } 6	
		Re-started			
		1884	1888	5	
37. Rangoon	Do.	1880	Still working	20	
38. Amherst	Do.	1880	1886	6	
39. Moulmein	Do.	1880	1886	6	
40. Mergui	Do.	1889	1894	5	
41. Port Blair	Do.	1880	Still working	20	

Thirty-five tides are evaluated in this volume, viz:—

8 Semi-diurnal Lunar Tides,
5 Diurnal Lunar Tides,
3 Long-Period Lunar Tides,
3 Semi-diurnal Solar Tides,
2 Diurnal Solar Tides,
2 Long-Period Solar Tides,
5 Compound Tides,
7 Over-Tides.

In addition, an endeavour has recently been made by Mr. Eccles, on a method devised by Professor Darwin, to evaluate the Latitude-variation Tide and the 19-yearly Nodal Tide at Bombay. Mr. Eccles' results have been sent to Professor Darwin for his opinion.

From the commencement of the tidal operations it was arranged by Colonel Walker and Lieutenant Baird, that each observatory should be furnished with a complete equipment of meteorological instruments, and daily records of temperature, pressure and wind have been taken at every station. These records are available for future investigation, but no effective use has hitherto been made of them. Some attempts have been made in India to trace a connection between errors of tidal prediction and the effects of wind and pressure, but so far without success. Great difficulties beset these investigations: irregular tides falsifying predictions, may be produced on a coast by the occurrence in mid-ocean of storms, which are too distant to affect the barometer or anemometer of the tidal station; or the effects of storms may be transmitted through the air and the water at widely different velocities, and may thus be recorded on the tidal and meteorological instruments at widely differing times.

The several tidal stations on the coast of India have been connected with each other by trans-continental lines of spirit-levelling, executed with the utmost precision, the details and results of which will be embodied in a subsequent volume of this series. As, however, it has been found necessary, for the aid of engineering projects, to reduce the levels in every part of India to one common datum, the closing errors of the lines of spirit-levelling have been dispersed, and the corrected values of the levels have been published in pamphlets. The dispersion of errors, which has hitherto been carried out, must be regarded as preliminary only, and the method of adjustment, which is to be finally adopted, cannot yet be decided. In the preliminary dispersion the determinations of mean sea-level at Indian tidal stations have been *assumed* to be errorless: the closing errors, that appear at the ends of lines of levels, carried from tidal station to tidal station, have been *assumed* to be due to the spirit-levelling operations only, and the values of the heights of intermediate stations have been corrected accordingly. The possible fallibility of these assumptions is recognised. Each succeeding year's tidal observations give additional data; new and more correct values of mean sea-level, than those which have been adopted, are annually being deduced. As, moreover, the several lines of levels cross and recross each other, now forming a network, the method of dispersing each closing error, as it appears, over its own immediate line, can only be regarded as a temporary expedient, and the system of successive distributions must at some future date be replaced by a simultaneous reduction: the probability of error in the determinations of mean sea-level will then have to be considered.

The height of the tidal station at False Point, as derived from the direct determination of mean sea-level in the Bay of Bengal, was 1·72 feet *lower* than the value given by a line of spirit-levelling, 2223 miles long, which had emanated from the mean sea-level at Karachi,—the mean sea-level in the Bay of Bengal being thus apparently 1·72 feet *higher* than that at Karachi. On the line of levels, 1065 miles in length, which connects Bombay with Vizagapatam, a closing error of 1·363 feet appeared, the direct determination of mean sea-level at Vizagapatam being *higher* than the value derived by levelling from Bombay.

This volume has been written to give, firstly, an account of the tidal observations that have been taken, secondly, an explanation of the methods of computation, and thirdly, an abstract of the results, that have been obtained. The letter-press contains the theory of tides, as expounded by Professor Darwin, and no original investigations have been attempted. The co-tidal chart attached to this volume was prepared by Colonel J. Hill, R.E., from whom also Mr. Eccles has received valuable assistance. Chapters I and II contain historical sketches, and were compiled by Mr. Eccles from the Encyclopædia Britannica and from the records of the Government of India. Chapters III to V are based on the Manual of Tidal Observations, written by Major A. W. Baird, R.E., in 1886. Chapter III is devoted to a description of the tidal instruments and of a tidal observatory; in Chapter IV are explained the principles, that govern the selection of a site for a tidal station, the methods of erecting and adjusting the instruments, and the duties of the observer and inspecting officer; in Chapter V it is explained how the tidal diagrams are prepared. Chapters VI and VII are devoted to the harmonic analysis of tides, and have been compiled by Mr. Eccles from Professor Darwin's Reports to the British Association for the Advancement of Science. Chapter VIII deals with tidal prediction, and has been compiled from the writings of Mr. E. Roberts, F.R.A.S., under whose directions the tide tables for the Indian ports from 1880 to the present date have been produced: Part I of this chapter has been derived from an article by Mr. Roberts, which appeared in the 'Engineer' of December 19th, 1879, and Part II was written by Mr. Roberts at Mr. Eccles' request for this volume.

In conclusion I must acknowledge, on behalf of many successive officers of the Survey of India Department, our great indebtedness to Professor George Howard Darwin, M.A., L.L.D., F.R.S., F.R.A.S., Plumian Professor of Astronomy and Experimental Philosophy, Cambridge, for the valuable assistance which we have uniformly received from him during the progress of the tidal operations in India, and for the many benefits which we have derived from his published writings on tides. Without the cordial co-operation and sympathy of this eminent mathematician the success, that has attended the Indian Tidal work, could not have been achieved.

S. G. BURRARD, MAJOR, R.E.,

Superintendent Trigonometrical Surveys.

Dehra Dún, February, 1901.

PART I.

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PART II.

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TIDAL OBSERVATIONS

PART I.

DESCRIPTION OF THE INSTRUMENTAL EQUIPMENT

AND OF

THE OPERATIONS GENERALLY

WITH

DETAILS OF THE SYSTEM OF OBSERVING

AND OF

REDUCING THE OBSERVATIONS.

CHAPTER I.

INTRODUCTORY.

1.

Brief Historical Sketch.

The ordinary phenomena of the rise and fall of the waters of the sea approximately twice a day, of the dependence of the times of high water on the passages of the moon and sun across the meridian, and of the heights of the tide on the relative position of the sun and moon with regard to the earth, are familiar to most people at the present day. It is, however, only of comparatively late years in the world's history that anything definite has been known of the true cause of the various changes in the sea-level, and it is only quite recently that systematic observations have been made on them. The ancients seem to have known very little about the tides, probably from their voyages having been made for the most part in the Mediterranean Sea where there is no sensible tide except at the ends of deep bays. Homer is supposed to have referred to them in the 12th book of the Odyssey where he speaks of Charybdis rising and retiring thrice a day, and Herodotus and Diodorus Siculus speak of the tides in the Red Sea. The first person who appears to have had an idea as to their cause was Pytheas, a navigator of Marseille, who lived about 330 B. C. and made some voyages in the northern seas of Europe. It is stated of him, by Plutarch, that he ascribed the phenomena of the tides to the moon. The Greeks can have been little acquainted with the tides, for it is recorded that the army of Alexander the Great was startled on first seeing them near the Persian Gulf. Besides, Aristotle in all his works only speaks of the tides three times; he mentions the great tides in the north of Europe, and states that the tides were ascribed by some (probably Pytheas) to the moon and that the tide in a great sea exceeds that in a small one. Among the Romans, as might be expected from the extent of their conquests, more frequent reference is made to the phenomena of the tides: Cæsar mentions them in *De Bello Gallico*, Book iv, and Strabo, following in the wake of Posidonius who appears to have had a very clear idea of the subject, divides the phenomena into daily, monthly, and annual. He observes that the sea rises as the moon approaches the meridian whether above or below the horizon and falls again as she rises or falls, that the tides increase at new and full moon, and are greatest at the summer solstice. Pliny explains the phenomena at some length, and ascribes them to the sun and moon dragging the waters along with them. Seneca and Macrobius also speak of the tides, and describe their motions with some degree of accuracy.

The next one who did anything more than merely collect the opinions of his predecessors was Kepler. In accounting for the tides he seems to have been aware of the principle of gravitation, but not of the law. He says that all bodies attract each other, and that the waters of the ocean would all go to the moon were they not retained by the attraction of the earth. He then proceeds to explain that their elevation under the moon and on the opposite side is owing to the earth being less attracted by the moon than the nearer waters, but more than the waters which are more remote. Galileo objected to this theory and expressed regret that so acute a man as Kepler should have produced a theory which appeared to him to reintroduce the occult qualities of the ancient philosophers.

Such is a brief statement of what had been done prior to 1687 when Newton laid the foundation of all that has since been added to the theory of the tides by bringing his grand generalization of universal gravitation to bear on the subject. In the 19th corollary of the 66th proposition of Book i of the *Principia*, he introduces the conception of a canal circling the earth, and considers the influence of a satellite on the waters of the canal. It is, however, in Book iii, propositions 26 and 27, that he first determines the tidal force due to the sun and moon which are supposed to move in the equator, while the sea is supposed to cover the whole earth and to assume at each instant a figure of equilibrium. Considering only the action of the sun, he assumes this figure to be an ellipsoid of revolution with its major-axis directed towards the sun. The action of the moon produces a similar ellipsoid but of greater ellipticity, and the superposition of these two ellipsoids gives the principal variations of tide. This hypothesis, however, gave results discordant from the actual state of the tides, and in 1738 the Academy of Sciences of Paris offered as a subject for a prize, the theory of the tides. The authors of four essays received prizes; *viz.*, Daniel Bernoulli, Euler, Maclaurin and Cavalleri. Bernoulli's essay contained an extended development of the conception of the two ellipsoids, and under the name of the *equilibrium theory* is commonly associated with his name. The theory of the tidal movements of an ocean was therefore, as Laplace remarks, almost untouched when in 1774 he first undertook the subject. In the *Mécanique Céleste* he gives an investigation of the tides of an ocean covering the whole earth, but the theory although very comprehensive is far from representing the actual state of the case. Observation shows, in fact, that the irregular distribution of land and water and the variable depth of the ocean produce an irregularity in the oscillations of the sea of such complexity, that a rigorous solution of the problem is altogether beyond the power of analysis. Laplace, however, rested his discussion of tidal observation on the principle that—*The state of oscillation of a system of bodies in which the primitive conditions of movement have disappeared through friction is coperiodic with the forces acting on the system.* Hence if the sea is solicited by a periodic force, expressed as a coefficient multiplied by the cosine of an angle which increases proportionately with the time, there results a partial tide, also expressed by the cosine of an angle which increases at the same rate; but the phase of the angle and the coefficient of the cosine in the expression for the height may be very different from those occurring in the corresponding term of the equilibrium theory. The coefficients and the constants or epochs of the angles in the expressions for the tide are only derivable from observation. The action of the sun and moon is expressible in a converging series of similar cosines; whence arise the same number of partial tides, and these by the principle of superposition may be added together to give the total tide at any port. In order to unite the several constants of the partial tides, Laplace considers each tide as being produced by a fictitious satellite moving uniformly on the equator. Sir William Thomson and others have followed Laplace in this, but the method which is now adopted is due to Professor G. H. Darwin. The difference of treatment is in reality only a matter of phraseology, and the proper motion of each one of Laplace's *astres fictifs* is at once derivable from the *argument*, or angle under the sign of cosine, which Darwin associates with the partial tides.

Subsequently to Laplace the most important workers in the field were Sir John Lubbock (senior), Whewell, Airy and G. H. Darwin. The work of Lubbock and Whewell is chiefly remarkable for the coordination and analysis of enormous masses of data at various ports, and the construction of trustworthy tide-tables and co-tidal maps. Airy contributed an important review of the whole tidal theory. He also studied profoundly the theory of waves in canals, and explained the effects of frictional resistances on the progress of tidal and other waves. Darwin's principal contribution to the theory of the tides is contained in a Report to the British Association of a Committee for the Harmonic Analysis of Tidal Observations in 1883. In this paper he cuts himself free from the trammels of the *astres fictifs*, and exhibits each partial tide as depending directly on some periodic term in the development of the tide-generating potential of the moon and sun. He further applies the analytical method of harmonic analysis to the evaluation of the various constants, and reduces the expression for the height of the tide to a form adapted for arithmetical calculation.

2.

Early Observations.

One of the earliest sets of tidal observations was that taken at Brest between 1800 and 1806, followed, at the request of Laplace, by another set extending five years longer. It was with the results of these that Laplace compared his theory. About the year 1830 the construction of a self-registering tide-gauge gave a great impulse to tidal observations: continuous records of the tidal heights at numerous ports all over the globe were obtained, and tide-tables and co-tidal charts constructed.

The earliest observations taken in India appear to be those executed by James Kyd at the Kidderpore dock on the Hooghly between the years 1806 and 1827, and continued two more years on Saugor Island, the results being published in a series of diagrams. The next appear to be those of Colonel DeHavilland at Madras in 1821, but after the publication by Dr. Whewell of some suggestions in the Journal of the Asiatic Society of Bengal in 1833, where he expressed a hope that tidal observations would be made extensively in India, some observations were made at various places on the coast. More numerous, however, were the observations made by the Survey, Irrigation and Marine Departments in connection with their various works where a properly determined datum on which to found heights is essential. As a general rule they were personal observations, taken with a pole, sometimes only of high and low water, and at others of the heights of the tide at intervals of a quarter of an hour to an hour, but seldom extending for more than a month. The first time that a self-registering tide-gauge was used in India was in 1855 when, in connection with the triangulation, Lieutenant J. F. Tennant, R.E., of the Great Trigonometrical Survey, took observations at Kurrachee by means of a small instrument indicating variations of level to the one-hundreth part of a foot. At Kurrachee, personal observations were begun by Mr. W. Parkes, M.I.C.E., in 1857 and were continued by Mr. Price, M.I.C.E., Superintendent of the Kurrachee Harbour works, with very few interruptions till 1868, when a small self-registering instrument was erected by which the tidal curves were drawn graphically on a scale one-twelfth of the natural size: this continued working till December 1880. Mr. Parkes constructed tide-tables for Kurrachee from these observations; and also for Bombay from personal observations taken there. In 1871 Major B. R. Branfill of the Great Trigonometrical Survey, employed a self-registering tide-gauge at Tuticorin in connection with his triangulation: the observations extended from 12th May 1871 to 24th June 1872, and were reduced by the method of harmonic analysis. A small self-registering tide-gauge was set up at Aden in 1876, but the observations were not very carefully taken and were not very valuable. Besides these, the Marine and Irrigation Departments used self-registering tide-gauges at various places on the Hooghly in connection with their respective works of sounding and canal-making.

CHAPTER II.

ESTABLISHMENT OF TIDAL OPERATIONS IN INDIA.

1.

Observations in the Gulf of Cutch.

The events which led to the establishment of tide-gauges in the Gulf of Cutch are briefly as follows:—On the 18th August 1866, an article appeared in the *Bombay Saturday Review* in which two distinct questions were discussed:—1*stly* the encroachments of land on sea, or sea on land, as evidenced especially by the Gulf of Cambay and the coast of Káthiáwár; and 2*ndly* the alternate rising and sinking of land as evidenced by the Ran of Cutch.

The attention of the Government of Bombay was drawn to this article and the matter was referred to T. Oldham, Esq., Superintendent of the Geological Survey of India, for his opinion. The main points of his reply were embodied in a Government resolution as follows:—"With regard to the Gulf of "Cambay, the Government will be glad to adopt the suggestions of the Bombay Geographical Society and "have the survey of the coast made, and the soundings taken in such detail as the Society may approve. "But as to the more interesting question presented with the Ran of Cutch, it does not appear to the "Governor-in-Council that watching the line of coast now or learning its past history will give the "requisite information as to the raising or depression of the land * * * The mean level of the sea, "in the scientific acceptation of that phrase, is the only reliable datum to which observations for changes "of land level should be referred * * * There should therefore be a course of accurate tidal observa- "tions taken through two lunations at a point on the south coast of Káthiáwár, and also at a point as far "into the Ran as possible, to which the tide has free access. These should be referred to bench-marks "made in permanent masonry pillars close to high-water mark, and these marks should be connected to the "nearest principal stations of the Great Trigonometrical Survey by careful levelling * * * Captain C. T. "Haig, R.E., should be asked whether observations for mean-sea level have been taken in this neighbour- "hood sufficient for the above objects and, if not, what expense would be incurred to make them "and whether he would be good enough to undertake the duty." In regard to this resolution and with reference to the scientific acceptation of the term 'mean-sea level' Lieut.-Colonel J. T. Walker, R.E., Superintendent of the Great Trigonometrical Survey, remarks:—"At the present time the scientific "acceptation of that phrase is two-fold: it may imply either the mean of all the high and low waters, "or the mean of all the heights recorded for as long a period as possible, at short and equal intervals. "The first is the old acceptation of the term mean-sea level and it was the custom for many years to "restrict tidal observations to the times of high and low water. But strictly speaking the mean of all "the heights at indefinitely small intervals is the true mean-sea level, and this is the datum to which the "recent Ordnance Survey Levels of England, Scotland and Wales have been referred, though the "preceding levels of Ireland were referred to the mean of high and low water. The two data occasionally "differ very materially; for instance, the mean-sea level at Liverpool which has been adopted from all "the heights as the datum of the Ordnance Survey levels is 4·39 inches below the mean of high and low "water * * * while at Cardigan and Dundee the differences were found to exceed 6 inches."

Colonel Walker and Captain Haig agreed that "The tidal observations must be carried over a "much longer period than two lunations to give results of sufficient accuracy to serve the purposes of "measuring the changes of level that may take place in a period of ten years"—the period which, it was contemplated by Mr. Oldham, should elapse before undertaking a second set of observations. They also agreed that it would be necessary to connect the tidal stations with the bench-marks by spirit-levelling, as the variations of height were known to be small, *viz.*, not more than a foot or two in a century. Colonel Walker also considered that the tidal observations should be taken with a self-registering tide-gauge capable of registering very small variations. These ideas were approved of, and as there were no gauges of sufficient accuracy in India, suitable ones were ordered from Adie of London, which in due time arrived. In the meantime correspondence in regard to the details was carried on, and in 1870 Lieutenant H. Trotter, R.E., was ordered to enter on the preliminary investigations of testing the gauges by setting them up at Bombay and generally putting the instruments in adjustment for use in the next season: it was not, however, until 1872 that the operations really commenced.

On 27th November 1872, Lieutenant A. W. Baird, R.E., who had been placed in charge of the Tidal and Levelling Operations in the Bombay Presidency, was ordered to proceed on a reconnaissance of the Gulf of Cutch for the selection of sites for the tidal observations, one being required as far into the Ran as possible, to which the tide has free access, another near Bet Island and a third as nearly as possible equidistant from the others. The stations were all to be, if possible, on the south side of the Gulf, but if not, the north side was to be examined; failing to find any of these sites, the south coast of Káthiáwár was to be examined.

The stations selected were:—Hansthal, about sixteen miles from Jodiya at the head of the Gulf, with seventy-two feet of water within one-hundred feet of the shore at low water: Navánár, on the Cutch Coast about ten miles from Mundra, with nineteen feet of water at low tide: Okha Point, opposite the Island of Bet, with twenty-three feet of water at low tide: so that with the exception of Navánár on the Cutch Coast, the actual positions of the selected sites almost coincided with those required. The instruments were set up on land close to high-water mark, the floats working in cylinders connected with deep water by means of pipes. The observations were commenced at Okha on 27th December 1873, at Hansthal on 13th February 1874, and at Navánár on 24th April 1874, and were continued till May 1875 when the observatories were dismantled.

In connection with the observations Captain Baird remarks:—"The party may be fairly congra-"tulated on the general success of the project in having secured at Okha and Hansthal Tidal "Stations complete sets of tidal combined with meteorological observations which will compare favour-"ably with what has been done both in England and in America, and in having so far succeeded "at Navánár Tidal Station that the observations taken will be sufficient to evaluate, by differentiating "with both Okha and Hansthal which were working simultaneously, the principal data required. The "levelling operations combined with the tidal observations complete the work necessary for one part of "the project and fix the level of about thirty miles of the Ran of Cutch for the season 1874-75, and a "repetition of the work some twenty years hence will effectually settle the question of secular depression "in this peculiar region." The cause of the discontinuity in the observations at Navánár was the silting up of the foreshore to such an extent in two months that a place, where there was twenty feet of water at low tide in April, was high and dry in July at low-tides, and some twenty-five or thirty feet inshore from low-water mark.

The reductions of these observations were for the most part done in England by Captain Baird and Mr. E. Roberts of the Nautical Almanac Office, who had made the whole of the tidal reductions for the British Association. When the work was completed Captain Baird returned to India stopping at Aden, under instructions from the India Office, to examine and set to rights a small self-registering tide-gauge which was working there. He found the previous records useless and advised that the instrument itself should be discarded and a new set of instruments substituted.

2.

Systematic Observations.

In a resolution of the Government of India, dated 4th July 1877, the Governor General-in-Council observes:—"That the great scientific advantages of a systematic record of tidal observations on "Indian coasts have frequently been urged upon and admitted by the Government of India. Hitherto "the efforts in the direction of such a record have been desultory and, in many cases, wanting in in-"telligent guidance and careful selection of the points where the observations should be recorded. "Additional importance has recently been given to the subject by the institution of a Marine Survey "Department, for whose operations accurate tidal observations are a necessity without which no per-"manent record of the changes of ground in the different harbours of the coast can be kept up. The "advantages to be expected from well considered and carefully conducted observations of the tides are "mainly the following:—1. They enable standards to be fixed for the purposes of survey; 2. They "afford data for the calculation of the rise and fall of the tides and thus subserve the purposes of navi-"gation; 3. They are of scientific interest apart from their practical usefulness as stated above.

"The first two of these are of strictly local bearing: an accurate survey of a port is essential to "the safety of the shipping frequenting it, and correct tide-tables are necessary for the convenience of "navigators and for engineering purposes within the port itself.

"The Governor General-in-Council is of opinion that, in view of these considerations, every port "where a tide-gauge is set up should pay for its establishment and maintenance from port funds. The "third object, the scientific results to be expected from the record, will be sufficiently provided for by "the appointment by the Government of India of one of its own officers to supervise and control the "local observations and to arrange for their utilization to the utmost possible extent * * * His "Excellency-in-Council accordingly resolves to intrust the general superintendence and control of tidal "observations upon Indian Coasts to Captain Baird, R.E., Deputy Superintendent in the Great Trigo-"nometrical Survey Department, who will be guided in his operations by the orders and advice of the "head of that department."

It was thus decided that the ports were to pay for the instruments and also for the cost of conducting the operations; but in the case of ports too poor to pay for the instruments, the use of those belonging to the Survey Department was granted on loan. The places at which gauges should be set up were settled by Captain Baird, in consultation with the Surveyor General, Colonel Walker, R.E., and Captain Taylor, Superintendent of Marine Survey. It was further decided that some of the ports should be permanent stations, that is, that the registration should be carried on continuously for at least nineteen years, while four or five years' observations would be sufficient at minor stations for all practical purposes. The arrangements for procuring and setting up the instruments were made by Captain Baird, with the various local Governments, and by October 1878 gauges were set up at Bombay, Kárwár, Vizagapatam, Pámban near Cape Comorin, and Beypore near Calicut; the establishment of a gauge at Madras was kept back by delay on the part of the port authorities there.

CHAPTER III.

DESCRIPTION OF THE INSTRUMENTS AND THE OBSERVATORY.

1.

Self-Registering Tide-Gauge.

The object aimed at in any complete system of tidal observations, is to obtain the height of the tide, above some fixed mark or datum, for every instant of time during a more or less extended period which has been fixed as far as regards Indian observations at not less than five years. This object is attained graphically by causing the rise and fall of the water to communicate its motion, by mechanical means, to a pencil which traces a line on paper wound round a drum turned by clock-work once in twenty-four hours. The height of the fixed mark or datum being indicated by a line on the paper, the distance of the pencil from the line, reduced to the proper scale, will be the height of the water above the datum at the time indicated by the position of the pencil.

An instrument such as above briefly described is called a Self-registering Tide-gauge, and of these, various forms have from time to time been constructed: the best form is, according to the opinion of Sir William Thomson, one in which the drum is inclined to the vertical, as this enables the friction between the pencil and the paper to be nicely regulated. The pattern almost exclusively used in India is that known as Newman's pattern in which the drum is horizontal, the only exception being a small gauge at Prince's Dock, Bombay, where the drum is vertical.

The description of the gauge in common use, or Newman's pattern, is given below, while that of the Prince's Dock Gauge will be found elsewhere in the volume.

The motion due to the rise and fall of the water is directly communicated to a float partially immersed in it; and that the float may be freed as far as possible from wave-action, it is surrounded by a cylinder made of thin iron plate to which the admission of the water is so regulated, that there is no sensible retardation between its rise and fall in the cylinder and outside.

The iron cylinder, *A*, (see Plate I) is made in lengths of from four to eight or even ten feet, with angle iron flanges at each end for bolting the lengths together: the bottom of the cylinder is generally closed with an iron plate, and the top reaches to the floor of the observatory, or sometimes one or two feet above it. The diameter of the cylinder of the ordinary pattern in use is twenty-four inches.

If the cylinder rests on the ground, the best inlet for the water is through holes, near the bottom of the cylinder, below the lowest level of spring-tides, but at the same time well clear of the ground on which the cylinder rests: if it does not rest on the ground, the bottom of the cylinder is the best place for the holes.

It sometimes happens that the cylinder cannot be fixed in deep water, and when this is the case a pipe connection between the sea and the cylinder is necessary. The piping used is ordinary gas-pipe in lengths of about fourteen to twenty-two feet with an internal diameter of two or three inches. The size of the pipe should be regulated by the double consideration that it must not be large enough to allow of irregular movements of the water being transmitted through it, nor small enough to cause any retardation of the rise and fall of the water in the cylinder; as regards the latter condition, the following computation justifies the adoption of the diameter given above.

Calculation to show the relative level of the water inside a cylinder of 24 inches diameter and that of the sea, the connection being made with a 2-inch pipe 300 feet long which has two bends of 90° each.

From Beardmore's *Manual of Hydrology*, Table 8,

$$\text{The discharge for a 2-inch pipe} = \frac{26 \cdot 69}{\sqrt{\frac{l}{h}}} \text{ cubic feet per minute,}$$

where $l =$ the length of the pipe in feet,

$h =$ the head of water in feet.

Now, assuming the water in the sea to have risen 1 inch higher than in the cylinder, there is a head of 1 inch, and

$$\sqrt{\frac{l}{h}} = \sqrt{\frac{300 \times 12}{1}} = 60,$$

therefore, the discharge is 768 cubic inches per minute, supposing that there are no bends in the pipe.

Also the quantity of water required to raise the level of the cylinder 1 inch is $12^2 \times \frac{22}{7}$ cubic inches nearly, that is, about 453 cubic inches, so that a head of one inch would discharge the quantity required in less than $\frac{3}{5}$ of a minute.

But when there are bends in the pipe, the head required to overcome them varies with the angles of the bends and the velocity of the water through the pipe.

The area of the connecting pipe in section is equal to $\frac{22}{7}$ square inches nearly, so that the length of pipe which would contain a volume of water sufficient to raise the water in the cylinder 1 inch, is $453 \div \frac{22}{7}$ inches or 12 feet nearly; and if this amount is to be discharged into the cylinder in $\frac{3}{5}$ of a minute, the velocity of the water must be 20 feet per minute, or a little more at the beginning and at a little less at the end to allow for the variation of the head.

Now by Beardmore's *Manual of Hydrology*, Table 9, for a mean velocity of 20 feet per minute and two bends of 90° each, a head of $\cdot 0048 \times 2$ inches or $\frac{1}{100}$ of an inch very nearly is required and even if a velocity of 25 feet per minute is allowed for, the head is only $\cdot 0075 \times 2$ inches or $\frac{1}{70}$ of an inch nearly, so that the bends need hardly be taken into account.

Now suppose that there is an 18 feet rise and fall of the tide at springs, *i.e.*, a mean of about 3 feet an hour, then the water will rise $\cdot 36$ of an inch in $\frac{3}{5}$ of a minute.

Combining the above arguments, it follows that if the sea-level was an inch higher than the water in the cylinder, the latter would be raised to this height in $\frac{3}{5}$ of a minute by which time the sea would be $\cdot 36$ of an inch higher. But the tide rising increases the head, and the water would tend on that account to flow quicker: also the sea-level would only be raised 1 inch in $1\frac{2}{3}$ minutes so that the difference of level under the conditions specified may be considered as inappreciable.

The piping used at the stations in the Gulf of Cutch was arranged as follows:—

The lengths of the piping were fitted with cast-iron flanges made to screw on each end so that the pipes were easily joined together and the connections made perfectly air-tight. The piping was connected with the cylinder, at about nine inches above the bottom, by a small bend (see fig. 2) and was then brought up vertically outside the cylinder to a height of one or two feet below the lowest high-water. At this point there was another bend fitted with a stop-cock, for the purpose explained a little further on, and from this bend the pipe was taken down along the slope of the shore to the low-water line, where lengths of flexible suction-pipe were joined on and taken out to deep water. This piping was formed by covering a helix of copper wire two inches in diameter, with a coating of india-rubber and canvas and was made in lengths of fifty or sixty feet and fitted with screw couplings. At the end of the outer length, a cylindrical copper rose about fifteen inches in length and two inches in diameter was screwed on: it had some one hundred and fifty holes of three-tenths of an inch bored in it, and was supported above the ground on a tripod fixed in deep water. The object of the copper rose was to prevent the pipe from becoming accidentally choked by sea-weed.

A T-shaped connecting piece (see fig. 1) was fitted to the end of the iron pipe and a length of the flexible piping could be fitted to either of its two outer extremities, the other being closed with a brass disc. When the flexible piping had to be removed for cleaning, the brass disc was unscrewed and a length of spare flexible piping with a rose attached, screwed on and taken out to deep water temporarily: the original pipe was then taken off and cleaned, the disc being screwed on for the time in its place and, when the cleaning was finished, the pipe and the disc were replaced in their original position so that there is no interruption of the record. This contrivance has been found to be superfluous.

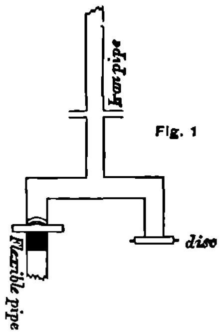


Fig. 1

In connections of this sort there is a decided tendency for air to collect in the piping, causing a retardation of the flow of water in and out of the cylinder. It was to remedy this defect that the stop-cock, alluded to above, was placed at the upper bend of the iron pipe as in fig. 2. As the stop-cock was below high-water mark it is clear that when it was opened, at the time of any high water, the air was expelled and the levels of the water inside and outside the cylinder became identical. It was occasionally found necessary to keep the stop-cock open for four or five hours while the water was above the cock. A water-tight box was made in halves and fitted over and under the stop-cock as in fig. 2, holes having been cut to admit the pipes and carefully caulked up after the box had been fitted over the pipe.

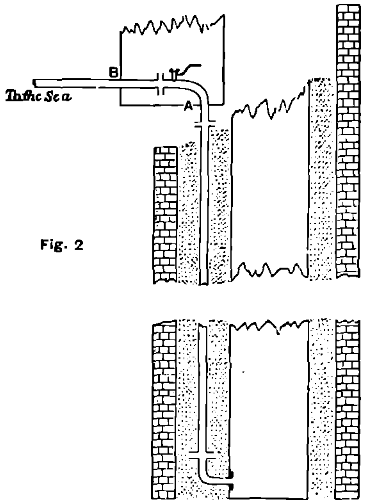


Fig. 2

At other stations a system similar to the above in all essentials, though differing in detail as for instance placing the piping inside the cylinder instead of outside, was employed. It is not meant to lay this method down as the best possible but only as an indication of what a pipe connection should be: the circumstances at each place will be the best guide to the system to be employed, but it must above all things be borne in mind that a pipe connection is the last resort and that every endeavour should be made to place the cylinder in deep water.

The float is a cylindrical copper vessel one foot in diameter and nine inches deep, and is of such a density that it will just sink if unsupported. The band, *B*, (see Plates I and II) is a copper ribbon, about an inch wide, perforated with holes, *b*, about two and a half inches apart. It is attached by means of thumb-screws and a plate to a pillar which carries three small rollers so arranged that they bear on their upper surface a disc attached by three uprights to a plate soldered to the float. The pillar passes through the disc, its lower end being pivoted into the plate, so that the arrangement, as shown in fig. 1, Plate IV, forms a kind of swivel and prevents the band from being twisted.

The band passes over a stud-wheel, *C*, (see Plates I and II) which is of brass about nine and a half inches in diameter with a rim an inch wide: it has studs, *c*, of the same diameter as the holes, *b*, in the band, placed in the rim at intervals of about two and a half inches, so that when the band is passed round the wheel, the studs exactly fit into the holes, thus ensuring the revolution of the wheel as the float rises and falls. The band is cut to such a length that it passes over the stud-wheel and about six feet beyond, when the float is in its lowest position in the cylinder. A weight is attached to the free end of the band as a counterpoise to the float, and from the bottom of this weight a copper chain is suspended which should be equal in weight, length for length, to the copper band. The other end of the chain is attached to an eyelet below the float so as to form with the band a sort of endless chain passing over the stud-wheel and reaching to the bottom of the cylinder. This contrivance is introduced in order that the pull on the float shall be constant, otherwise a systematic error would be introduced between rising and falling water. The counterpoise weight should be such as to give a decided preponderance, of say three or four pounds on the float side, and when once adjusted, it should not be altered without carefully noting the fact for future reference. When the whole system of float, band and counterpoise weight is hanging in position, there is about four inches space between the float and the cylinder on the one side, and the counterpoise weight and the cylinder on the other.

The bed-plate of the gauge, *Q*, (see Plates I, II and III) is of cast-iron, about seven feet long, one foot broad and three-quarters of an inch thick, the upper surface being carefully planed. Underneath this plate and cast in the same piece with it, is a web, *R*, four inches deep, which extends to within an inch of the edge of the upper plate all round, and has diagonals or stiffeners. The web rests on a wooden trestle, *S*, the top of which is five feet long, one foot broad and two inches thick, its legs being splayed and firmly braced. The trestle is placed longitudinally in the observatory, and touches the top of the float cylinder at one end.

The axle, *D*, (see Plates I and II) of the stud-wheel is supported on two uprights, *E*, *E'*, fixed to the bed-plate. It is about eight inches long, and carries at its other end a toothed wheel, *F*, which is in gearing with another toothed wheel, *F'*. The latter is fixed on an axle which is supported by two arms, *f*, (see Plate I) fastened to, *O'*, (see Plates I and II) one of the uprights which support the drum. These toothed wheels, *F*, *F'*, are constructed in couples so as to enable the working scale of the tidal diagrams to be varied at pleasure from the natural or full scale to that of $\frac{1}{8}$th according to the range of the tide. Six couples are supplied with each gauge, giving scales of $\frac{1}{1}$, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$ and $\frac{1}{8}$, and as the drum is five feet long, any tide of which the range does not exceed thirty feet can be safely registered. At Bhávnagar where the range is over thirty-six feet, a $\frac{1}{10}$ scale is employed. In practice that couple is selected which enables the tidal curves to be exhibited on the largest scale possible.

The axle which carries the toothed wheel, *F'*, also carries the chain-wheel, *G*, (see Plates I and II) round which the chain, *g*, (see Plates I, II and IV) regulating the motion of the pencil-holder, *H*, winds, so that the motion of the water is communicated to the pencil. The chain-wheel, *G*, is about five inches in diameter, and its rim is grooved so that the chain winds round it without over-lapping.

At about ten inches from each end of the bed-plate there are brass uprights, *O*, *O'*, (see Plates I, II and III) fixed each carrying a pair of friction rollers, *o*, the pins on which the rollers turn being screwed into the uprights some five inches above the bed-plate.

The drum, *L*, (see Plates I, II and III) is composed of sheet-brass and made as nearly as possible into a true circular cylinder, five feet three inches in length and exactly twenty-four inches in circumference, and axles, *M*, (see Plates I and III) project from each end and rest on the friction rollers. One axle being elongated, passes through an oblong slot in the upright, *O*, and carries a toothed wheel, *N*, to gear with the driving clock, *P*, (see Plates I, II and III). The position of the drum is horizontal, and the paper on which the tidal curve is registered, is wrapped round it, being held in position by the clips, *w*, (see Plates II and III) and the edges pasted together along the length of the drum. Two grooves, *v*, (see Plates I and III) about one-sixteenth of an inch deep and exactly five feet apart are cut round the drum, one near each end, and a third is cut midway between them. The groove at the clock end is generally adopted as the *zero-line* of the gauge, and when the paper is fixed on the drum, the zero, middle and end lines are indicated on it by rubbing over the grooves with a hard pencil. The paper is nearly five feet three inches long, and extends well beyond the extreme grooves.

Parallel to the length of the drum and fixed above it to the brass supports, *O*, *O′*, there are two bars, *I*, (see Plates I, II, III and IV) of solid brass drawn to angle shape: between these a slide, σ, (see Plate IV) moves and carries the pencil-holder, *H*, so as to keep it always over the centre line of the drum. The pencil-slide, σ, is a double T-shape and moves along the bars, being pushed towards one of them by a spring, *s*, (see Figs. 2 and 4, Plate IV) the spring being shown dotted in the former, so that there is no lateral motion; the upper flanges of the parallel bars are gripped between the springs, *s′*, (see Plate IV) and the upper plate of the slide for extra smoothness of motion. The bars, *I*, are prevented from buckling or having lateral motion by two arched stiffeners, *J*, (see Plates I and II) which are screwed to the outer sides of the bars and allow the slide and pencil-holder to pass through them.

The flexible chain, *g*, is fastened at one end to the chain-wheel, *G*, and carried round it: the other end is attached to a swivel, *l*, (see Figs. 2 and 3, Plate IV) on a cylindrical capstan-headed screw, *y*, (see Figs. 2 and 3), working into the body of the slide, σ, and by means of the screw, *y*, the slide can be moved along the bars, and the pencil adjusted for height to the zero of the gauge. At the other end of the pencil-slide there is a wire loop, *l′*, (see Figs. 2 and 3). A silver wire, *K*, (see Plates I and III) is tied to the loop, *l′*, and after passing over a rimmed pulley, *k*, at the end of the bars close to the clock and thence over another pulley, *k′*, on the bed-plate, (see Plate III), it has a weight of about five pounds attached to its other end, to ensure the pencil-slide moving when the water falls; a sufficient space must of course be allowed for its drop as the pencil moves between the bars. The pencil-holder, *H*, is a small tube which screws into the slide, σ, and is adjusted so that it almost touches the paper on the drum. It is made to contain common leads which are pressed down on the paper from above by a weight of two or three ounces, placed in a cup provided for the purpose.

The driving clock, *P*, is furnished with an English lever escapement and gold hair-spring. The movements are boxed in by moveable brass slides, and the oil-cups protected by bushes. The drum is driven by means of a toothed wheel of the clock gearing with another, *N*, on the axle of the drum. The arrangement for connecting and disconnecting the clock and the drum is as follows:—A clamping-screw, *p*, (see Plates I and III) with a milled head is connected with an interior arbor, so that when the screw is clamped, the driving toothed wheel of the clock is not moveable on the arbor, but when the screw is released the wheel can turn freely, and thus permit the drum to be placed in any position required, when the clamping of the screw will again bring the two toothed wheels into gear with the rest of the wheel-work of the clock.

In order to prevent any back-lash which may exist between the gearing of the clock and the drum, a cord carrying a weight, *T*, (see Plate I) of about five pounds is attached to, and encircles a barrel, *U*, (see Plates I and III) on the axle of the drum, thence passing over a pulley, *t*, (see Plate III) on the bed-plate. This barrel carries a pawl which drops on to a ratchet-wheel on the drum, neither of these being shown on the plates: it also carries a crown-wheel, *W*, (see Plates I and III), which gears with a bevel-pinion, *X*, (see Plate III). This pinion turns freely in a socket fastened to the upright, *O*, which supports the clock end of the drum. The outer end of the pinion is square, and the key which winds the clock fits it. In winding the pinion, the barrel is also turned, thus winding up the weight which prevents the back-lash, while any backward motion is stopped by the pawl and ratchet on the drum.

2.

Self-Registering Aneroid.

In the self-registering aneroid (see Plate V) there are seven vacuum-chambers or boxes, *A*, coupled together: the top one is attached to a screw, *B*, used for setting the metallic registering pointer; and a fork, *C*, with hardened steel bearings, is fixed to the lowest one. By means of knife-edges, a lever, *D*, rests on these bearings and connects the balancing-spring, *E*, with the vacuum-boxes, being pivoted on other knife-edges, *F*, midway between the attaching points. The vacuum-boxes and balancing-spring are placed on a brass frame, *G*.

The balancing-spring, *E*, is a spiral one hooked at the bottom to the lever, *D*, and at the top to a screw, *H*, which works in the upper part of the frame, *G*: the spring in connection with the lever prevents lost motion and by means of the screw its pull is so adjusted, that the reading of the instrument corresponds to that of the mercurial barometer under the particular atmospheric conditions existing at the time of its first adjustment. This adjustment, made by the maker, ought not to be altered unless the instrument has to be taken to pieces.

The movement produced by the variation of the atmospheric pressure on the boxes is multiplied by the lever, *D*, and further by the lever, *I*, supported on two uprights, *J*, and counterpoised. These two levers are connected together by a steel rod, *K*, pointed at both ends and pivoted in conical holes out of which it is prevented from slipping by means of forks.

A third lever, *L*, projects from the clock, *O*; it is the same length as the lever, *I*, and attached to it by a jointed piece, *M*, whose length is half the height of the recording barrel, *N*. The piece, *M*, is moveable, and at its centre a metallic pointer, *P*, is fixed for the purpose of marking on the prepared paper on the barrel: the pointer can be adjusted to press more or less heavily as required. Attached to the back of the lever, *L*, there is a sliding piece, *Q*, which is moved by the clock-work three times an hour, by means of a bent piece, *R*, the spring, *S*, preventing lost motion. The movement of the piece, *Q*, affects the lever, *L*, so as to twist the joint, *M*, and press the pointer, *P*, against the paper.

To the brass frame, *G*, on which the vacuum-boxes are placed, is fixed a steel tube, *T*, and on this the revolving drum, *U*, pivots, being maintained in position by a nut, *n*, screwing in the top of the tube. The tube is hollow to admit of a turnscrew being inserted to set the recording pencil to agree with the mercurial barometer.

At the bottom of the revolving drum, *U*, there is a crown-wheel, *V*, which gears by means of a pinion, *W*, with the clock. The drum revolves in eight and a half days. The recording barrel, *N*, on which the specially prepared paper supplied by the maker is fixed, rests by its own weight on the revolving drum and has a knob, *Y*, on the top with a hole through it of the same size and for the same purpose as the hollow in the steel tube. The several pieces are fitted on a substantial brass plate, *Z*, about twenty-one inches long and six inches wide, screwed on to a board an inch thick, and the whole instrument is fixed in a neat case, with a glass front, the top and front being made to open on hinges.

3.

Self-Registering Anemometer.

The self-registering anemometer as shown in Plate VI is fitted with Robinson's cups, *A*, (see Fig. 1) and steering-vanes, *B*, and has a long protecting tube, *C*, to prevent dust or rain blowing into the bearings. This tube is screwed on to the hollow chamber, *D*, in which is placed the mechanism shown on a larger scale in Fig. 2.

The instrument differs from the ordinary pattern in as much as the steering-vanes are made as large as possible, with a sharper angle than usual, and the screw which works the wheel of the indicating shaft has a quicker thread, so that smaller changes in the direction of the wind may be recorded on the drum, *O*, (see Figs. 3 and 4). The movement of the cups and vanes is communicated by means of the mechanism shown in Fig. 2 to the marking helices, *h, h*, by the two pairs of crown-wheels, *E, E'*, (see Figs. 3 and 4) which also are much larger than the usual pattern so as to produce easier gearing. The cylinders carrying the helices are counterpoised by weights, *w, w*, (see Fig. 4).

The screw, *F*, (see Figs. 3 and 4) enables the helices to be lifted off the drum so that the diagram may be fixed on the latter, the adjustment for time being made by means of the pencil, *p*, fitted with a spring so that it may be pressed down on the diagram.

The clock, *H*, (see Figs. 3 and 4) has a lever escapement with a gold hair-spring: it is driven by a weight, *I*, and is fitted with a dial, *K*, (see Fig. 3) showing minutes.

The driving-barrel of the clock movement is drilled through the centre and a shaft passes through the hole and bears on its outer end a pinion, *i, i*, (see Fig. 4) gearing with a wheel, *L*, on the axle of the drum, and on the other end, outside the clock, a milled-headed screw, *S*, (see Figs. 3 and 4). This arrangement allows the registering drum to be easily set, for, by loosening the screw the centre spindle becomes free, and after setting the drum to correct time the screw is again clamped.

To prevent back-lash in the drum, the double pinion, *i, i*, is made in two parts: one part is fixed on the spindle and the other is loose, but attached to the fixed part by means of a circular wire spring not shown in the plate. This spring is pressed back when gearing the double pinion and causes the tooth of the wheel, *L*, which is in gear, to be clamped on both sides and prevents lost motion.

4.

Tidal Observatory.

The form of the observatory has been somewhat modified from time to time as additional experience has been gained from the working at various stations. The pattern now generally adopted as most convenient is shown in such detail in Plate VII, that it need not be further described. It is built of wood and so constructed as to be readily taken to pieces for removal to another station when required.

The internal fittings consist of a cupboard fixed on the wall to hold various documents and stores and to support the self-registering aneroid; a shelf near the top of the observatory for the recording-gear of the self-registering anemometer, and a table on which to spread out the tidal diagrams.

5.

Graduated Staff.

A staff graduated to inches, is fixed vertically outside the observatory in such a position as to be easily read, so that a comparison of the level of the water outside and inside the cylinder can be readily made.

6.

Bench-marks of Reference.

Two or three embedded bench-marks are laid down in the vicinity of each observatory: they are similar to those in general use on the principal lines of levelling of the Great Trigonometrical Survey, and are connected with these lines by rigorous levelling, according to the system adopted by the Survey Department. The details of the levelling connecting the bench-marks and bed-plate made at each inspection are recorded on the printed forms of the Department, and are carefully preserved for future reference if necessary.

7.

Self-Registering Tide-Gauge in use at Prince's Dock, Bombay.

The gauge was constructed by Messrs. Légé and Co. in 1879, under the supervision of Mr. E. Roberts, of the Nautical Almanac Office, in accordance with suggestions made by Mr. G. E. Ormiston, late Engineer to the Bombay Port Trust, and Captain A. W. Baird, R.E.

The observatory is situated on the centre pier of the Prince's Dock, and occupies the interior of the base and first floor of the light-house. The gauge is in communication with the deep water outside the dock, a well for the cylinder and a connection with the sea having been arranged for in building the dock. It was necessary to set up the gauge on the first floor because the dynamo for the electric light is on the ground floor, and this would have affected the clock, had the gauge been erected near it. A general description of the gauge is first given, to exhibit its construction and mode of operation, followed by a detailed account of each part. The letters refer to Plate VIII.

A vertical cylinder is placed in communication with the sea, by suspending it in a masonry well twelve feet in diameter, from which a nearly horizontal shaft twenty-four feet long reaches deep water; this renders the water affecting the gauge undisturbed, while its surface fairly represents the level of the surface of the water outside.

Resting on the water in the cylinder is a float which rises and falls with it, and to the float is attached a copper band, *b*, which passes over a wheel, *s*, called the stud-wheel. The rise or fall of the float communicates motion to the stud-wheel, and the stud-wheel in turn, by means of a toothed-wheel, *t*, on its own axle, communicates motion to another toothed-wheel, *t'*. On the same axle as the latter, and consequently moving with it, is a sheaved-wheel, *p*, called the pencil-wire wheel, round which a fine wire is wound; one end of this wire is secured to the circumference of the wheel, while the other hangs free and is fastened to a pencil-traveller, to which it communicates vertical motion. The pencil passes through the pencil-traveller horizontally and records the vertical motion of the latter on paper moving over a vertical, cylindrical drum, *B*: the drum revolves once in twenty-four hours by means of clock-work and the pencil is lightly pressed by a spring against its cylindrical surface. The paper is continually stretched over the portion of the drum under and about the path of the pencil-traveller, and is drawn off a second vertical drum, *C*, on which a considerable length is rolled. A third vertical drum, *A*, actuated by the same clock-work, rolls up the paper as it leaves the surface of the drum, *B*. Another pencil, *z*, pressed against the paper near the pencil-traveller guides and on a level with the zero of the traveller, marks a line on the paper, to which the heights of tide recorded by the pencil are referred. Projecting pins at one hour intervals, near the top and bottom of the drum, make pin-holes in the paper as it passes under the pencil-traveller, so that, from vertical straight lines joining these, the time of any recorded level of the water may be estimated. These pins also ensure that the paper moves with the drum. Any deviation of the pencil-traveller from a vertical path is prevented by parallel guides, *g*, *g*, on which a scale of feet is engraved, so that an indicator on the pencil-traveller shews the height of the tide above the zero of the scale. The upper ends of the spindles of the three drums turn in bearings in an upper horizontal plate, *u*, and the lower ends in bearings in a horizontal bed-plate, *v*. The upper horizontal plate carries the clock-face and the bearings of the stud-wheel, pencil-wire wheel, and toothed-wheels, and has the upper ends of the guides fitted to it: the horizontal bed-plate is supported by two cast-iron trestles, *D*, *D*, and the rigidity of the frame secured by a cast-iron bracket to which the trestles are bolted. The gauge is protected by a panelled case with glass front and back, capable of being easily taken off.

In the detailed account of the various parts which follows, the principal parts are described in the order in which they were mentioned in the general outline, and the details are described along with the principal parts to which they belong.

The cylinder does not materially differ from that used with Newman's pattern of tide-gauge, and the float is identical with the pattern used with that gauge.

The band, *b*, is a copper ribbon, three-quarters of an inch wide and between forty and fifty feet long, the great length being due to the position of the gauge on the first floor of the light-house: the cylinder only extends to the level of the ground floor, and the band is protected by a wooden trough from the mouth of the cylinder up to and through the first floor. The band is fastened to the float in the same manner as is adopted with Newman's pattern of tide-gauge. It extends vertically upwards from its fastening to the float until it reaches the circumference of a sheaved guide-wheel, *o*, eight and a quarter inches in diameter. From this guide-wheel, which merely keeps it clear of the bed-plate, the band passes upwards and over the stud-wheel, *s*. It is pierced by oval holes to engage with the studs on the circumference of the stud-wheel. From the stud-wheel it passes vertically downwards through a hole in the bed-plate and is rolled up on the circumference of a sheaved-wheel, *r*, also eight and a quarter inches in diameter, on whose axle is a fusee, *f*, actuated by a cord which is led clear of the gauge by a pulley on the bed-plate and a block on an iron arm, and supports the counterpoise weight, *c*, the object of this being to ensure the band being always kept taut. The stud-wheel, *s*, is a sheaved-wheel eight inches in diameter. The band just fits between its flanges; the studs, about a quarter of an inch long and an eighth of an inch in diameter, and exactly two inches from centre to centre, are given a curved taper which allows the band to engage and disengage with perfect facility.

On the axle of the stud-wheel is a toothed-wheel, *t*, one inch in diameter, gearing with another toothed-wheel, *t'*, six inches in diameter.

On the axle of the latter is a sheaved-wheel, *p*, four inches in diameter, on which the pencil-traveller wire, a very fine brass wire, is wound and from which the free end of the wire depends. It will be seen that this combination of wheels results in the pencil having one-twelfth the motion of the float, *i.e.*, that the gauge works at a scale of one-twelfth the natural scale.

The pencil-traveller is an oblong block of metal an inch and a half long, having a small staple screwed into its upper end: it hangs by the pencil-traveller wire, which is knotted to the staple: a spring of bent wire is fastened to the upper part of the traveller and presses an ordinary lead, through a horizontal hole in the traveller, against the paper. The front of the traveller carries an indicator, *i*, level with the centre of the pencil-point, for the purpose of reading a graduated scale of feet engraved on the guides.

The guides, *g*, *g*, are formed by means of a slot passing vertically down the centre of a long brass plate, which is set up in front of the instrument between the upper horizontal plate and the bed-plate. The pencil-traveller works behind the plate, and the indicator passes through the slot, and moves along the face of the guides; the graduation zero, with which the indicator on the pencil-traveller is level, when the surface of the water is level with the zero of the gauge, is about four inches above the bed-plate, and from zero the scale is graduated downwards to read exceptionally low tides. Two side-plates are fitted to the guides and graduated like the latter: their straight edges nearly touch the paper and are used by the clerk to rule lines on the diagram equi-distant from the position of the pencil at prescribed hours: against these the date and hour are written, and they serve to fix the time-lines drawn through the pin-holes; they also act as a check on the regularity of the clerk.

The paper as marked by the pencil is extended over, and moves with, the drum, *B*, a cylinder twenty-four inches long and exactly twenty-four inches in circumference of its circular section. The upper inch of this drum is not covered by the paper: it is graduated for time into twenty-four hours, each of which measures one inch and is divided into ten-minute, and then into two-minute, graduations: a metal pointer fixed to the upper horizontal plate indicates a position on the drum two hours distant from the pencil-point and is called the time-index. This cannot be seen on the plate as it is hidden by the guides. Vertically under each hour graduation are two pin-points arranged to pierce the paper near its upper and lower edges and to mark it for time, as well as to ensure its moving with the drum. To the lower face of the drum is fixed a toothed-wheel, which gears into and drives a corresponding wheel under the drum, *A*. The drum, *B*, is directly driven by the clock, and revolves in the direction of the hands of a watch: the other drums of course revolve in the contrary direction. The paper is drawn off the drum, *C*, by the drum, *B*, and the friction to be overcome in rotating, *B*, suffices to keep the paper stretched. To press it against the pin-points, two rollers are used, their axle, *a*, being set up between the upper horizontal plate and the bed-plate. This axle is also used to carry a zero-marker, *z*, which by a lead pressed on the paper marks a line exactly level with the zero of the scale on the guides.

The drum, *A*, rolls up the paper after it has received the record. It rests simply by its own weight on the toothed-wheel driven by that under the drum, *B*. This wheel tends to rotate it just fast enough to accommodate the paper from *B* when *A* is empty, its diameter then being four inches. As *A* increases its diameter with accumulated paper, it slips on the revolving wheel beneath it, and so compensates its tendency to pull the diagram off *B* too fast. The drum, *C*, is similar to *A*, but only two inches in diameter, and is driven merely by the pull-off action exerted on the paper by the pins on the drum, *B*, of which six at the top and as many at the bottom are holding the paper at once. Both the drums, *A* and *C*, are twenty-two and a quarter inches long. The paper is continuous and one foot nine and a half inches broad, unmarked by time or height lines; about a thousand feet, or enough for fifteen months' record, are put on at a time. The completed record is cut off once a month.

The upper horizontal plate, *u*, is of iron, its form is clearly indicated in Plate VIII and the bed-plate, *r*, is also of iron, about nine inches wide and two feet six inches long: its greatest depth, about one inch, is at its centre and it tapers towards each end.

The clock, *x*, an ordinary pendulum clock is fixed underneath the bed-plate. The driving weight, an iron cylinder about one foot long and six inches in diameter, hangs below the floor by the cord, *w*, which passes over a pulley and under the bed-plate to the fusee it actuates. To prevent the weight from turning, an iron staple is fixed on its side and passes up and down an iron rod, set vertically downward, from the under side of the floor. The pendulum weight, *y*, is about one foot long and two inches in diameter, with a double milled-headed screw for adjusting the length of the pendulum: the pendulum hangs from a flat spring fixed on an inverted V-support. The hands must not be touched in setting the clock, for this would upset the agreement of the time-index and the clock hand.

CHAPTER IV.

SELECTION AND MAINTENANCE OF A TIDAL OBSERVATORY.

1.

Directions for starting a Tidal Observatory.

The choice of a site for the erection of a tide-gauge depends so much on local circumstances, that a careful reconnaissance of the fore-shore is a necessary preliminary to the selection of the best of the generally limited number of suitable positions.

The gauge should be placed so as to obtain a fair representation of the tidal oscillations of the surrounding area: to secure this it is necessary (1) that the sea should have direct communication with the gauge and not approach it through tortuous channels; (2) that the spot chosen should be sheltered from heavy weather, and (3) that there should be deep water at low-tide close to it. A good position is the end of a pier or jetty, or the wall of a dock; but it must be pointed out that a position in a cove or a minor bay at the head of a large bay, though it may apparently answer the above requirements, is not a good one for a tidal observatory, as experience shows that, at stations where the range is small (as in the south of India) the tidal curves in such a spot often present a zig-zag appearance all along the rise and fall. The irregularities are certainly not caused by lumpy water, because it has frequently been noticed that they were being registered inside the float-cylinder at times when the surface of the water outside was perfectly smooth, and no swell or ripple was apparent to the eye. The peculiarity may be seen in the curves at Kárwár and Beypore, though the scale of the illustrations is so small that it is not very marked: it has not yet been met with in tidal rivers.

When a station has been selected near deep water, and a pier, jetty or dock wall is available for the purpose, the observatory is built on it and the cylinder fixed in the water. But if nothing in the nature of a pier is available, and one cannot be specially constructed in deep water except at a prohibitory cost, the observatory must be erected on the shore, the cylinder sunk in the ground, or in a masonry well, and connected, as described in Chapter III, with the sea by piping.

The graduated staff is set up and the bench-marks are laid down as described in the preceding chapter. The trestle is put in position, longitudinally in the observatory and touching the float-cylinder at one end, and the tide-gauge placed on it in such a position that the centre of the float, the band and the counterpoise weight shall all be in a diametral plane of the float-cylinder, and also so that the float and the counterpoise weight shall each be about four inches from the sides of the cylinder. The trestle is then wedged up until its top is nearly level and its legs are firmly screwed to the floor. After this the bed-plate is levelled, longitudinally and transversely, by driving wedges in between the web and the top of the trestle.

The extreme range of the tide having been found roughly, either by observations on the staff or from local information, the various parts of the instrument are tested to see that they work freely and that there is enough drop, at extreme tides, for the counterpoise weight attached to the pencil-slide. The wheels to govern the scale of the diagram are then placed in gear with the float-wheel, a trial diagram put on and the instrument approximately adjusted so that at half-tide the pencil will be at the centre of the drum.

Sometimes the zero of the gauge, referred to at page 13 and accurately defined at the beginning of the next chapter, is made to correspond with some particular level which has been taken as the datum for local surveys, and the instrument is adjusted accordingly. For example, when soundings are being taken in the vicinity and the times noted, the gauge readings at those times may be made to indicate the amounts to be subtracted from the soundings to find the distances of the bed of the sea below the datum.

Whatever be the approximate adjustments, careful measurements must next be taken to determine the distance of the water below the surface of the bed-plate when the pencil is on the zero of the gauge. In making these zero-measurements, as they are called, a special apparatus is employed.

A flat strip of brass with a right-angled band is fixed by two or three countersunk screws to the top of a box-wood scale, divided into tenths, hundredths and five-hundredths of a foot, so that when the flat piece of brass lies on the bed-plate, the scale hangs vertically down, and care is taken that the under surface which rests on the bed-plate corresponds exactly to the zero mark of the box-wood scale. A small circular wooden disc, three inches in diameter and half an inch thick, is attached, by means of a brass clip fixed on the top of the disc, to a Chesterman's tape. The clip is made of two brass plates about two and a half inches long and one inch broad, one fixed vertically at the centre of the disc and the other attached to it by four screws at its corners, so as to be removed at pleasure. The tape is held between the plates, a line being drawn across the tape to show exactly how it is to be placed relatively to the top of the brass clip. The disc is slightly loaded with lead so that, when hanging from the tape, its under surface is quite horizontal. The distance from the bottom surface of the disc to the top of the clip is exactly three inches. The tape itself is marked at every foot from five feet to thirty feet by applying it to a standard, the disc being held suspended all the time, so as to have the tape in tension under the same conditions as when in use.

The measurements are taken as follows:—The scale is placed in position over the float-cylinder and the disc is lowered into the cylinder, care being taken to keep the tape close against the scale. When the disc is seen to be close to the surface of the water, warning is given to an assistant, and the lowering is continued very carefully until actual contact with the water is noticed by the disc causing a tremor on the surface. At the moment of contact a signal is made to the assistant who marks on the diagram the position of the pencil, and the distance in feet is read off the tape while the tenths, hundredths and thousandths are read off the scale. This distance is entered in a book, called the inspection book, in one column; the measurement of the position of the pencil above the zero-line on the drum is then carefully made, and entered in the next column. The latter entry is multiplied by the denominator of the fraction indicating the working scale of the gauge and entered in a third column. The sum of the entries in the first and third columns gives a value of the distance of the water from the bed-plate when the pencil is on the zero-line, or, in other words, the distance of the zero of the gauge from the bed-plate.

Sets of measurements, each set consisting generally of twenty measurements, have to be taken both during a rising and a falling tide when the water is well on the rise or fall, and the mean of the two sets is the adopted value of the zero below the bed-plate: this eliminates the influence of the lost motion or back-lash between the toothed-wheels connecting the stud-wheel and the chain-wheel, and also the error arising from looseness of the pencil in the pencil-holder. If the value of the distance of the zero below the bed-plate agrees with the true zero previously fixed upon in regard to the datum, there is nothing more to be done; but if not the chain must be lengthened or shortened by means of the milled-headed screw until the agreement is complete. Reference lines are then painted on the band at the level of the top of the bed-plate when the pencil is at each of the three grooves in the drum, and the gauge may then be started.

The float-end of the bed-plate should now be connected by careful spirit-levelling with the bench-marks and with the graduated staff and, if necessary, the graduation of the latter altered so that its zero may correspond with that of the gauge.

It merely remains to set up and start the meteorological instruments, and the tidal observatory is in complete working order.

2.

Duties of the Clerk in charge of the Observatory.

Printed instructions are given to the clerk in charge concerning his work which is carried out as follows:—The observatory is visited each day at 7 and 10 A.M. and at 4 and 6 P.M., except on Sundays when two visits are considered sufficient; and also twice a month, as a rule, to change the diagram.

The tide-gauge clock is wound up twice a week and the back-lash weight every evening. At each visit to the observatory, the position of the pencil on the drum is marked with a circle of ink round the pencil at the exact hour, and the date of the month written alongside, so that, should the drum not be truly circular, the diagram can be redivided by means of these hour marks. The preceding day's curve is inked in with one of the coloured inks supplied, and simultaneous readings of the position of the pencil on the diagram and of the bed-plate on the float-band are taken once daily and entered in the daily report of which a specimen is given below, so as to make sure that the band has not been displaced. The height of the water for each hour of the preceding twenty-four hours is carefully measured off and entered in the report.

No. 2357.

Daily Report of Bhávnagar Tidal Observatory, G. T. Survey of India, dated 16th May, 1892.

S. R. Tide-gauge No. 2 working on the $\frac{1}{10}$ scale.	Wound up Clock at	Opened Stop-cock for a few minutes at H. water at	Took off Sheet No. 172 at 11-26 A.M. Put on Sheet No. 173 at 11-32 A.M.	Position of Pencil on Drum. 7 A.M.	10 A.M.	4 P.M.	6 P.M.	The Band read 34 at Bed-plate. Pencil read 34 on Drum at 5 hours 57 minutes P.M. Rising Tide.	Clock fast or slow of mean time by T. Office	Back-lash weight wound up at
				Feet.	Feet.	Feet.	Feet.			
	7·9 A.M.	Left open from 5·0 to 8·10 A.M. 5·30 to 9·40 P.M.		3·036	2·060	2·178	3·404		Correct	6·1 P.M.

S. R. Aneroid Barometer No. A.	Wound up Clock at	Took off Sheet No. 338 at 12-5 P.M. Put on Sheet No. 339 at 12-7 P.M.	7 A.M.	10 A.M.	4 P.M.	6 P.M.		7 A.M.	Minimum.	10 A.M.	4 P.M.	Maximum.	6 P.M.
			Inches.	Inches.	Inches.	Inches.	Thermometer attached to S. R. Barometer.	81°·5	80°·5	91°·5	100°·5	101°·0	99°·0
	7·22 A.M.		29·938	29·966	29·942	29·926	Do. Mercurial Barometer.	82 ·5	...	94 ·0	100 ·0	...	97 ·0
Mercurial Barometer No. 1726 readings at			29·926	29·994	29·858	29·860	Reset: Minimum and Maximum Thermometers at 6·0 P.M.						

Anemometer No. B.	Wound up Clock at	Took off Sheet No. 2349 at 10 A.M. Put on Sheet No. 2350 at 10-1 A.M.	Number of miles in last 24 hours. 414 General direction of wind. Changeable
	7·1 A.M.		

Position of the Pencil for each of the 24 hours from midday yesterday to midday to-day.

Hour.	Feet above Zero.
Noon	0·942
1 P.M.	0·834
2 "	1·236
3 "	1·900
4 "	2·726
5 "	3·346
6 "	3·584
7 "	3·634
8 "	3·494
9 "	2·960
10 "	2·502
11 "	2·000
12 "	1·538
1 A.M.	1·196
2 "	1·134
3 "	1·574
4 "	2·116
5 "	2·634
6 "	2·982
7 "	3·036
8 "	2·886
9 "	2·432
10 "	2·060
11 "	1·586
Noon	...

The Zero-line marked on the diagram = ·006 foot below the Zero cut on the Drum.

* Weather. Clear.

Water at Tide-gauge. Calm.

The rainfall from noon yesterday to noon to-day = *Nil* inches.

Remarks.

Graduated Staff = 34·30, Pencil on Drum = 3·400 } at 5·57 P.M. Rising Tide.

* The state of the sea should be recorded, such as boisterous or calm, heavy rollers coming in from South-west, water at Tide-gauge, calm or rough or very rough, as the case may be.

Compared by *Port Officer.*

(Sd.) KANJI KUBAR, *Clerk in Charge.*

The clock of the tide-gauge is compared daily with the gun or time-ball, or with a watch previously taken to the telegraph office, where Madras time can be correctly obtained at 4 P.M., and local time is deduced by applying a correction for longitude. The clock is corrected if it is over thirty seconds wrong, and the error is noted in the report with a remark as to whether or not it has been corrected. Any stoppage of the clock is noted on the diagram and also in the report. The reading of the pencil on the diagram and the height of the water at the same moment on the graduated staff, is taken once a day and entered in the report. If there is an unmistakeable difference of two-tenths of a foot when the water is calm, the cylinder is flushed out and the communication holes examined. On the day after the diagram is put on and again on the day it is taken off, the zero, mid and end lines are marked by rubbing a hard pencil over the grooves cut in the drum so as to make a line half an inch long at the hours of 10 A.M., 2 P.M. and midnight. A part of the paper not marked by any curve should, if possible, be selected and the date entered against each set of marks. The diagram, as a rule, is changed once a fortnight, generally every second Monday, when the tide has well turned so as to make sure of getting the highest and lowest tides recorded.

The change of diagram is made as follows:—The new diagram is numbered and dated, and a narrow slip is cut out in readiness for setting the zero-line; it is damped all over with clean water and paste applied to the overlap. The hour and date when the work was stopped is noted in ink on the old diagram and the pencil-holder is taken off. The diagram on the drum is cut carefully along the 12 o'clock line, the back-lash weight removed, the clips unscrewed and the diagram taken off, carefully rolled up and put aside. The drum and the clock are disconnected and the new diagram put on, making the 12 o'clock line of the paper agree with that marked on the drum and the zero of the diagram with that of the drum by means of the small slits cut out of the paper. The clips are screwed down and the drum turned round by hand till the outer edge of the diagram comes in contact with the 12 o'clock line and the height-lines meet. The pencil-holder is then fixed and the clock and drum clamped, care being taken that the pencil is over the part of the diagram which corresponds, as nearly as possible in time, with the time of the clock. The back-lash weight is carefully and slowly put on and the hour of commencing work noted on the diagram. It only remains to fix the position of the drum exactly for time. Any convenient hour, say noon, is selected and at one minute before, the connecting-screw of the clock and drum is unclamped; then when the second hand shows the exact hour, the drum is turned till the pencil is exactly over the hour-line of the diagram and the connecting-screw clamped very firmly, otherwise the clock may fail to drive the drum.

The stoppage of the clock, or in fact anything unusual, is noted on the diagram and in the daily report. If the clock stops, the weight is removed from the pencil-cup and the pencil slightly raised; the connecting-screw is unclamped, the drum held so that the back-lash weight does not run down, and revolved by hand so as to bring the pencil as nearly as possible over that part of the diagram which corresponds to about five minutes in advance of the correct time: the pencil-weight is replaced and the clock started and stopped again at an exact hour. The pencil is then adjusted to that hour and the clock and drum clamped. When the reference watch indicates that hour the guage is started.

If by any chance the band comes off the stud-wheel, it is carefully replaced by turning the wheel until the pencil is on the mid-line of the diagram, and fitting the corresponding or 2·5 hole in the band which is marked with paint on the stud similarly marked; as the marks were made when the 2·5 line marked on the float-band was brought to agree precisely with the bed-plate, the pencil, when the wheel is released, assumes its proper position. If the chain between the pencil-slide and the float-end breaks, the pencil-holder is removed, the counterpoise weight detached and the two pieces of the chain taken out and re-rivetted. The ends are then attached to the wheel and slide as before and the stud-wheel turned by hand till the 2·5 line is on a level with the bed-plate. If the deviation of the pencil from the mid-line on the drum is small, it is set right by the adjusting screw attached to the pencil-slide; but if the deviation is greater than the range of the screw, one of the toothed-wheels is taken off, and the chain wheel turned slightly; it is then replaced and the final adjustment made with the adjusting screw. During the whole operation, great care must be taken that the band does not kink.

If there is a stop-cock, it is opened every day, at high water or as near it as is convenient, but not if the level of the water is nearly the same as the height of the stop-cock.

The aneroid and mercurial barometers and the thermometers are read at 7 and 10 A.M., and at 4 and 6 P.M. If the clock of the aneroid stops, the hand is turned gently round till it points to the proper time as shown by the tide-gauge clock. The barrel is then turned till the pencil points to the proper time on the diagram and the instrument started. Great care is necessary, otherwise the gold thread in Adie's pattern, or the marker in Légé's may be broken. In the former, the setting is not attempted when the clock hands are between five minutes to an hour and ten minutes past, as the pencil marker suspended to the gold thread is, at these times, either pressing on or close to the barrel; in the latter it is best done at five minutes past a full hour.

The aneroid clock is wound up every Monday morning and is regulated by stopping for a few minutes, if fast, or pushing the minute hand forward, if slow, but it is not altered if the error is only one or two minutes. The diagrams are carefully numbered and changed every Monday morning and the sheets inked in as they are taken off and put away.

The clock of the anemometer is wound up every morning by pulling the cord with the small weight so as to raise the heavy driving weight close up to the bed-plate. The diagrams are changed daily at 7 A.M.: they are inked in daily, dated and numbered, and the hours at which they were put on and taken off recorded on them and in the report. The number of miles of wind for the last twenty-four hours, obtained by counting the number of velocity lines and multiplying by ten, is also entered in the report. The daily reports on the forms supplied (see page 22) are made up in duplicate and one copy sent by post to the Tidal office. Anything unusual is marked on the diagram and noted on the back of the report, and if anything very urgent is required, the port-officer telegraphs to the officer in charge of the Tidal party.

3.

Inspection of a Tidal Observatory.

As a rule an inspection is made once a year, but if any interruption has taken place, such as the removal of the instruments for safety on account of a cyclone, as has occurred more than once, or on account of the settlement of the observatory which may necessitate a temporary suspension of the observations pending repairs, an inspection should be made as soon as possible after the information has been received. Before making an inspection, the accuracy of the one-foot graduations of the Chesterman's tape with which the zero-measurements are made is tested, and a tape is not used continuously for more than a couple of months without being retested and, if necessary, corrected.

The inspecting officer takes with him an inspection box which contains a copy of the Handbook on Tidal Observations, and of the current Tide-Tables for Indian Ports, besides the scales, measuring tape and other instruments required at an inspection; and he is accompanied by a mechanic to dismantle, clean, repair if necessary, and refit the instruments. He writes a report in the observatory inspection book, kept for the purpose, at the time of the inspection and a copy of it is forwarded to the Tidal office. It is usually divided under the following heads:—

General Remarks.
Bench-marks.
Details of Levelling.
Self-registering Tide-gauge.
Details of Determination of Working Zero.
Auxiliary Instruments.

In the general remarks, an account of the working of all the instruments since the last inspection is given, and attention drawn to the manner in which the clerk in charge performs his duties, and to anything else requiring special notice. At the actual inspection, the first thing done is to ascertain if any settlement of the tide-gauge has taken place, by connecting the float-end of the bed-plate by careful spirit-levelling with the bench-mark of reference, which in turn is connected with the other bench-marks and with the graduated staff to test the accuracy of the zero of the latter. The results and the details of the levelling are entered in the report, mention also being made as to the condition in which the bench-marks and the staff were found, and as to whether the bed-plate was level both longitudinally and transversely.

A set of zero-measurements (as described on page 20), is then taken at rising and falling tide and entered in the inspection report as having been made *before cleaning* the gauge. If it is thought desirable to take more measurements, another pair of sets is taken before proceeding with the inspection. Concurrently with the zero-measurements, a comparison of the reading of the pencil on the drum with the reading of the bed-plate on the float-band and with the reading of the graduated staff is made both at a rising and a falling tide and entered in the report. Before cleaning the gauge, its clock is compared with the telegraph or gun-time as a check on the previous recent comparisons entered by the observatory clerk in his daily reports.

The balance of the gauge is then tested by gently turning the stud-wheel so as to raise the float completely out of the water and taking the reading of a spring-balance hooked for the purpose to one of the holes on the counterpoise side. The reading of the spring-balance gives the preponderance of the float which ought to be about three or four pounds, but when once adjusted this should require no alteration, as a change would affect the value of the zero. Should the preponderance be found to have increased, it points either to a flaw in the float sufficient to have admitted an influx of water, or to a break in the counterpoise chain on the side of the counterpoise weight. After testing the balance and before cleaning the gauge, the 2·5 line of reference painted on the band is brought to the level of the bed-plate, and if the pencil is not on the mid-line of the drum the discrepancy is measured and noted.

The float and band are then raised into the observatory for examination and measurement, and the time of stopping the gauge noted. The total length of the band, and the distances of the 2·5 and 0 lines painted on it from its junction with the float are measured, to guard against such a case as occurred during the inspection of a tidal observatory in 1887 when it was found that the readings of the band and pencil agreed, but the measurements for the determination of the working zero differed largely from what they ought to have been. The measurements and examination of the band disclosed that it had been broken close to the float, and it was found that the observatory clerk had tried to conceal the breakage by attaching the float to the band at the place where the breakage had occurred. The float is carefully examined and repaired or renewed if any water is found in it. In such a case, it is interesting to ascertain the quantity of water which has found its way into the float, as it may have been sufficient to alter the balance of the instrument and raise the working zero. An instance of this occurred at the Dublat Observatory in 1882 where water entered the float in sufficient quantity to raise the working zero 0·14 of a foot.

The dismantling of the gauge is completed and the several parts thoroughly cleaned and oiled where necessary, special mention being made in the report as to whether the driving clock required cleaning or not: the reference lines on the band are however not yet obliterated. When the several parts of the gauge have been cleaned, they are carefully refitted, the band being replaced so that when its painted 2·5 line of reference is level with the bed-plate, the pencil shall be at, or close to, the mid-line on the drum. The working of the band on the stud-wheel, while the pencil is being moved along the drum from its zero to the highest line on the diagram, is tested at low-water, so as to reduce as much as possible the chance of the band kinking. The working should be smooth, each hole of the band fitting over its stud freely, and if any hole is found too tight it is enlarged slightly with a file. The bed-plate is made level both longitudinally and transversely and, if this operation is found by spirit-levelling to have altered the level of the bed-plate relatively to that of the bench-mark of reference, the alteration of level is recorded. The refitted gauge is still unadjusted, and to ascertain the amount of adjustment required, zero-measurements are taken at rising and falling tides and recorded in the report as having been made *after cleaning* the gauge. If a combination of the result of these measurements with the final level of the bed-plate makes the distance below the bench-mark of reference of the working zero differ from the distance of the true zero below the same bench-mark by a quantity appreciable on the scale of the diagram, the position of the pencil is adjusted until the working zero coincides with the true zero. It is usual to take, and record as having been made *after cleaning* the gauge, one more pair of sets of zero-measurements as a final test of the perfect adjustment of the instrument.

The gauge being in adjustment, the reference lines painted on the band at the last inspection are compared with the pencil readings on the drum, and if the former are found out of position they are obliterated and new ones substituted for them, care being taken that their *upper edges* correspond to the pencil readings.

The dismantling, cleaning and refitting of the self-registering aneroid and anemometer proceed at the same time as the similar duties in connection with the gauge. The aneroid is compared with the mercurial barometer, and its clock rated. The position of the pencil-marker on the diagram is adjusted, if necessary, by the screw so as to agree with the reading shown on the dial. The diagrams are examined to see if the marker is working freely, and if they show straight lines without rises at 10 o'clock and depressions at 4 o'clock, the marker is cleaned. The thermometers attached to the aneroid and mercurial barometers are compared, and the clerk is made to read the barometers and thermometers and to set the maximum and minimum thermometers. The diagrams are examined to ascertain that they have been inked in properly. The direction of the vane of the anemometer with regard to the wind and the marking of the direction on the barrel are tested, and the upper part of the instrument oiled, the cups being so marked that they cannot be put on wrongly. The clock is looked at to see if new catgut or anything else is required. The diagrams are examined and if the helices are marking faintly, their bearings, which should be quite free, are looked at, and their edges cleaned cautiously with a piece of fine sand-paper.

Before ending his inspection, the inspecting officer sees the observatory clerk make an accurate comparison of the tide-gauge clock, (which like all the other clocks in the observatory must keep *local time*) with the telegraph or gun-time, and enters the comparison in the report. He also sees that the clerk, in addition to being able to rate the clock, knows how to bring it to correct time when it is fast or slow, according to his printed instructions. A comparison of the reading of the pencil on the drum with that of the band at the bed-plate and with the level of the water on the graduated staff, is made and recorded after the gauge has been readjusted.

The inspecting officer also sees that a conspicuous note is contained in the observatory report book, for the information not only of the observatory clerk but also of the local official appointed to supervise him and superintend the working of the observatory, to the effect that whenever any interruption in the working of the tide-gauge takes place, owing, *e.g.* to the stoppage of the driving clock, hourly readings should be taken on the diagram by day and night during the interruption. If for any reason these readings cannot be taken, then hourly readings of the graduated staff should be taken by day and night and entered in the daily reports. Should this amount of frequency be unattainable, then it is indispensable that readings of high and low water should be taken day and night and entered in the daily reports. If the cause of the interruption be of so serious a nature as to render necessary the removal of the instruments from the observatory, the promptest information should be sent to the officer in charge of the tidal operations, to enable him to arrange for an inspection at the earliest possible date. The inspecting officer ends his inspection by taking a note of whatever diagrams, ink, books, pencils or other necessaries are required to be sent to the observatory.

CHAPTER V.

PREPARATION OF THE TIDAL DIAGRAMS.

1.

Correction of the Time-lines.

The tidal diagrams are examined and prepared for the reduction of the observations in the following manner:—Time-lines in red ink are drawn through each set of points which have been marked by the observatory clerk, showing the position of the pencil at the exact hours of 7 A.M., 10 A.M., 4 P.M. and 6 P.M., and these lines are the bases for drawing similar lines at the intermediate hours of the day. The daily reports are next examined to see if there are any clock errors amounting to three minutes or more: if there are, then crosses in red ink are made on the tidal diagrams to show the exact position of each hour. If the clock is fast, the cross is placed in *advance* of the vertical hour-line and if slow, *behind* it. The limit of three minutes' error has been adopted because one-twentieth of an inch is the smallest distance which can be conveniently and accurately laid down in measuring along the curve, and one-twentieth of an inch, on the scale of the tidal diagrams, is equivalent to three minutes.

2.

Breaks in the Curves.

Whenever a break in the curves occurs, owing to an interruption in the working of the tide-gauge, readings of the height of the water by day and night are taken at every hour, or (if such frequency is unattainable) at every high and low-water during the interruption as mentioned in the preceding chapter. These readings are plotted on the tidal diagrams and are connected by dotted lines which represent the tidal curves for the period of suspension of the automatic registrations.

3.

Definitions of the Zero-lines and the Adopted Level of the Bed-plate.

The true zero is that which has been adopted in determining the datum-line for heights in the tide-tables, and its relative level with regard to the bench-mark of reference is fixed. As a rule, the zero corresponds to that originally adopted when the gauge was started, and its distance below the bed-plate was determined when the level of the bed-plate with regard to the bench-mark was fixed.

The working zero is the level of the water with reference to the bed-plate when the pencil is on the zero-groove cut on the drum. In starting the instrument, the working zero corresponds to the true zero, but from various causes the instrument may get out of adjustment and its working zero may alter. The position of the working zero on the diagram is always marked by rubbing a hard pencil over the groove in the drum. At the close of an inspection, the working zero is made to agree closely with the true zero.

The accepted value of the true zero is the distance of the true zero from the bed-plate, which was determined when the bed-plate was fixed as regards its relative level with the bench-mark of reference.

The adopted level of the bed-plate means the level of the bed-plate with reference to the bench-mark of reference, which has been adopted in determining the true zero; as a rule this will correspond to the level obtained when the observations commenced.

4.

Rules for fixing the True Zero on the Diagrams.

The inspection book is first examined to see if the bed-plate has altered in level relatively to the bench-mark of reference, and if there is any difference from the adopted level exceeding ·02 of a foot, a correction is applied. The measurements for the determination of the working zero at the various inspections are next examined. If no alteration has been made in the adjustment of the gauge during an inspection, the whole of the sets of measurements are grouped, and the mean value taken to represent the distance of the working zero from the bed-plate at the inspection. If an adjustment has been made during an inspection, then the measurements for the determination of zero before and after adjustment are grouped separately, and the respective means used in connection with the preceding and following diagrams. In treating the diagrams for any period between two inspections, the distance of the working zero from the bed-plate is taken as the mean of the values taken at the inspections. The following are the cases which may occur and the ways of adjusting for them:—

I. *Bed-plate settled below adopted level.*—The true zero is placed above the working zero at a distance proportional to the amount of the settlement in accordance with the scale of the diagram; hence the measurements from the true zero will be less than from the working zero.

II. *Bed-plate raised above adopted level.*—The true zero is placed below the working zero.

III. *Bed-plate unaltered and working zero at a greater distance from the bed-plate than accepted value for true zero.*—The true zero is placed above the working zero.

IV. *Bed-plate unaltered and working zero at a less distance from bed-plate than accepted value for true zero.*—The true zero is placed below the working zero.

V. *Bed-plate settled and working zero at greater distance from bed-plate than true zero.*—The true zero is placed above the working zero at a distance equal to the sum of the corrections.

VI. *Bed-plate settled and working zero at less distance from bed-plate than true zero.*—If the correction for the settlement is the greater of the two, the true zero is placed above the working zero; but if the correction on account of the difference in the zero-measurements is the greater, then the true zero is placed below the working zero, the amount of alteration in each case being the difference of the two corrections.

VII. *Bed-plate raised and distance of working zero from bed-plate less than true zero.*—The true zero is placed below the working zero at a distance equal to the sum of the two corrections.

VIII. *Bed-plate raised and distance of working zero from bed-plate greater than true zero.*—The true zero is placed below the working zero, if the correction on account of the raising is the greater, and above, if the other correction is the greater, the distance between the zeros being the difference of the corrections.

If the determination of the true zero shows that the working zero comes within 0·005 of a foot of the true zero *on the diagram*, then no correction is necessary and the working zero is used as the line of reference in measuring the heights from the diagram. What is meant by being within 0·005 of a foot *on the diagram* is the actual difference between the true and working zeros reduced to scale.

IX. *Water getting into the float or a break in the counterpoise chain on the side of the counterpoise weight.*—This has the effect of raising the working zero, and is treated under IV, VI or VII, according as the bed-plate is unaltered, has settled or has been raised.

X. *Break in the counterpoise chain on the float side.*—This has the effect of lowering the working zero and is treated under III, V, or VIII, according as the bed-plate is unaltered, has settled or has been raised.

XI. *Kink in the band.*—While there is a kink in the band, the working zero is higher than when there is none: an examination of the diagrams will show when the band righted itself, and the first determination of zero can be used up to this time, and the second from this to the time of the second inspection.

To facilitate the work of preparing the diagrams, all information in regard to them is collected and recorded in a book entitled Determination of the True Zero on the Diagram, in the following form:—

(1). Level of bed-plate with reference to B.M. unaltered, or settled by   or raised by

No correction necessary, or correction under rule   equal to   has been applied to all diagrams from   to

	Feet	
(2). Distance of working zero from bed-plate at inspection of 18		Value from to = feet.
Distance of working zero from bed-plate at inspection of 18		

Correction on account of (1) or (2), or (1) and (2) =   applied and the true zero has been placed   above/below the working zero from   to   .

No other inspection having taken place, the value of the working zero at the inspection of 18   , as given above has been used in determining the true zero for the remainder of the diagrams, and for these diagrams the true zero has been placed   above/below the working zero in accordance with rule   .

5.

Height-lines for Final Measurements.

After fixing the true zero on the diagrams, other lines, generally about six inches apart, are laid down in red ink parallel to the true zero-line to facilitate the height-measurements which are made with paper scales divided according to the scale adopted for the particular diagram.

CHAPTER VI.

INVESTIGATION OF THEORETICAL EXPRESSIONS FOR THE REDUCTION OF TIDAL OBSERVATIONS BY HARMONIC ANALYSIS.

1.

General Explanation of Tides.

The general idea of the existence of tides may perhaps be best gathered by considering a planet, the earth, covered with water and attended by a satellite, the moon. The latter revolves round the former in an orbit nearly circular, but it will be simpler to consider the moon as fixed and the earth revolving round her. The moon then attracts every particle of the earth and ocean, and by the law of gravitation the force acting on any particle is directly proportional to the masses of the particle and of the moon, and inversely proportional to the square of the distance between the particle and the moon's centre. At the same time, as the earth is moving in a nearly circular orbit round the moon, each particle is tending to recede from the moon with a force, sometimes known as centrifugal force, jointly proportional to the square of the angular velocity of the earth round the moon and the distance between the particle and the moon's centre. These two radial forces, *viz.*, the attraction and the centrifugal force, balance each other at the earth's centre: also at a point nearer to the moon than the earth's centre, the former is greater, and the latter less, than it is at the centre, so that the attraction overbalances the centrifugal force. The difference of these two is the tide-generating force, and its action on a particle of water nearer to the moon than the earth's centre is to lessen the effect of gravity and allow the sea level to rise. The same effect is produced on the side of the earth remote from the moon owing to the centrifugal force overbalancing the attraction. Thus then it could be shown, in such an ideal case, that the form which the water would assume would be a prolate spheroid, with its major axis pointing towards the moon.

In the actual case, however, owing to the unequal distribution of land and water and the rotation of the earth, it must not be assumed that this is the case. For, suppose that the ocean consisted of a canal round the equator, and that an earthquake or any other cause were to generate a great wave in the canal, this wave would travel along it with a velocity dependent on the depth. If the canal were about thirteen miles deep, the velocity of the wave would be about one thousand miles an hour, and with a depth about equal to the supposed average depth of the existing seas, the velocity would be about half as great. Now, the moon's tide-generating force may be conceived as making a wave in the canal, and continually outstripping the wave it generates, for the moon travels round the equator at the rate of about one thousand miles an hour, and the sea is less than thirteen miles deep. The resultant oscillation of the ocean must therefore be the summation of a series of partial waves, generated at each instant by the moon and always falling behind her; the aggregate wave, being the same at each instant, must travel one thousand miles an hour so as to keep up with the moon.

Now, it is a general law of frictionless oscillation that, if a periodic force acts on a system, which, if left to itself, would oscillate in a period less than that of the force, the maximum excursion on one side of the equilibrium position occurs simultaneously with the maximum force in the direction of the excursion; but, if a periodic force acts on a system, which, if left to itself, would oscillate in a period greater than that of the force, the maximum excursion on one side of the equilibrium position occurs simultaneously with the maximum force in the direction opposite to that of the excursion. The latter is the case under consideration, for the period of a free wave in the shallow canal is greater than that of the moon's tide-generating action. Hence, when the system is left to settle into steady oscillation, it is low water under and opposite to the moon, so that the form of the water will be nearly an oblate spheroid with the minor axis pointing to the moon.

This conclusion about the tides of an equatorial canal is probably more nearly true of the tides of a globe partially covered with land, than the one in which the ocean is supposed at each moment to assume the prolate figure of equilibrium. In fact, observation shows that, speaking generally, it is more nearly low water than high water when the moon is on the meridian. Thus then an observer on the earth will have low water twice in a lunar day somewhere about the time the moon is on the meridian, either above or below the horizon, and high water halfway between the low waters. These are the 'semi-diurnal tides.'

If the sun be now introduced, there will be another similar tide of about half the height, depending on solar time and giving low water somewhere about noon and midnight. The superposition of this tide on the former, modified by friction and by the interference of land, gives the actually observed aggregate tide: hence it is clear that about new and full moon there must be spring tides, and at first and third quarters of the moon neap tides; and that, as the sum of the lunar and solar tide-generating forces is about three times their difference, the range of spring tides should be about three times that of neap tides, but a direct verification of this from tidal statistics is not readily obtained, owing to the difficulty of selecting tides exhibiting the effects of the disturbances caused by the sun and the moon under the circumstances in question.

Hitherto the luminaries have been supposed to move on the equator; but supposing that the moon does not, it is clear that the moon's zenith distance at upper transit is in general different from her nadir distance at lower transit. But the tide-generating force is greater, the smaller the zenith or nadir distance, and therefore the forces are different at successive transits. Thus there is a tendency for two successive lunar tides to be of unequal heights, and the resulting inequality of height is called a 'diurnal tide.' This tendency vanishes when the moon is on the equator, and as this occurs each fortnight, the lunar diurnal tide is evanescent once a fortnight. Similarly, in summer and winter the successive solar tides are generally of unequal height, while in spring and autumn this difference is inconspicuous; the various combinations of these inequalities give rise to the 'long-period tides.'

In Laplace's theory of the tides on a globe covered with ocean to a uniform depth, the diurnal tide is everywhere non-existent. But this hypothesis differs much from the reality, and in fact, at some ports the diurnal tide is so large that it overpowers the semi-diurnal, and during two portions of each lunation, there is only one great high water and one great low water in each twenty-four hours, whilst in other parts of the lunation the usual semi-diurnal tide is observed.

No existing theory of tides at all adequately represents the oscillations of the water, and this might be expected, owing to the very unequal distribution of land; it is only by a careful examination of the actual heights of the water at each station that satisfactory results can be arrived at. The comparison between tidal observations and tidal theories, and the formation of tables predicting the tidal oscillations of the sea have been carried out in two different ways, which may be called the 'synthetic' and the 'analytic.'

The semi-diurnal rise and fall of the tide, with the weekly alternation of spring and neap, would naturally suggest to the investigator to make his formula conform to the apparent simplicity of the phenomenon. He would seek to represent the height of the water by either one or two periodic functions with a variable amplitude; such a representation is the aim of the synthetic method. That method has been followed by all the great investigators of the past,—Newton, Bernoulli, Maclaurin, Laplace, Lubbock, Whewell, Airy. Since at European ports the two tides which follow one another on any one day are nearly equal, or, in other words, there is scarcely a sensible diurnal tide, these investigators bestowed comparatively little attention on the diurnal tides. If these be neglected, the synthetic method is simple, for a single function suffices to represent the tide. In non-European ports, however, the diurnal tide is sometimes so large as to mask the semi-diurnal and to make only a single instead of a double high water in twenty-four hours. To represent this diurnal tide in the synthetic method, it is necessary to introduce at least one more function. There should also be a third function representing the tides of long period. The expression for the tide-generating forces due to either sun or moon would consist of three terms, involving the declinations and hour-angles of the planet. One of these terms for each goes through its period approximately twice a day, the second once a day, and the third varies slowly. The mathematical basis of the synthetic method consists of a synthesis of the mathematical formulæ, so that the semi-diurnal term for the moon is fused with that for the sun, and the same process is carried out with the diurnal and the slowly varying terms. A mass of tidal observations at a place where the diurnal tide is small, soon shows that the fusion of two simple harmonic or periodic functions is insufficient to represent the state of the tide even if, as in all the older observations, it consists merely of heights and times of high and low water; the calculated heights and times of high and low water are found to need corrections for the variations of declinations, of motion in right ascension, and of the parallaxes of both bodies.

But, when continuously recording tide-gauges were set up, far more extended data than those of the older observations became accessible to the investigator, and more and more corrections were found to be expedient to adapt the formulæ to the facts. A systematic method of utilizing all the data became also a desideratum. This state of matters led Sir William Thomson (now Lord Kelvin) to suggest the analytic method. It is true that the dynamical foundations of that method have always lain below the surface of the synthetic method, and have constantly been appealed to for the theoretical determination of corrections: nevertheless the explicit adoption of the analytic method must be regarded as a great advance. In this method, the tidal force, or potential due to each disturbing body, is considered to be developed into a series of terms, each consisting of a constant (determined by the elements of the orbits and the obliquity of the ecliptic) multiplied by a simple harmonic function of the time. Thus in place of the terms of the synthetic method for the three classes of tides, there is an indefinitely long series of terms for each of the three classes. The loss of simplicity in the expression for the forces is far more than counterbalanced by the gain of facility for the discussion of the oscillations of the water. This facility arises from the great dynamical principle of forced oscillations, alluded to in the historical sketch given in Chapter I. Applying this principle, each individual term of the harmonic development of the tide-generating forces corresponds to an oscillation of the sea of the same period as the term, but the amplitude and phase of that oscillation must depend on a net-work of causes of almost inextricable complication. The analytic method, then, represents the tide at any port by a series of simple harmonic terms, whose period is determined from theoretical considerations, but whose amplitude and phase are found from observation. Fortunately the series representing the tidal forces converges with such rapidity, that it is necessary to consider only a moderate number of harmonic terms in the series.

One explanation is expedient before proceeding with the harmonic development. There are certain terms in the tide-generating forces of the moon, depending on the longitude of the moon's nodes, which complete their revolution in 18·6 years. Now, it has been found practically convenient in the application of the harmonic method, to follow the synthetic plan to the extent of classifying together terms whose periods differ only in consequence of the movement of the moon's node, and at the same time to conceive that there is a small variability in the intensity of the generating forces.

2.

Tide-generating Potential due to the Moon.

If a planet is attended by a single satellite, the motion of any body in relation to the planet's surface is found by the process described as reducing the planet's centre to rest. The planet's centre will be at rest, if every body in the system has impressed on it a velocity equal and opposite to that of the planet's centre; and this is accomplished by impressing on every body an acceleration equal and opposite to that of the planet's centre.

Let E be the mass of the planet,
M ,, mass of the satellite,
r ,, radius vector of the satellite measured from the planet's centre,
ρ ,, radius vector, measured from the same point, of the particle whose motion we wish to determine,
and z ,, angle between r and ρ.

The satellite moves in an elliptic orbit about the planet, and the acceleration, relatively to the planet's centre, of the satellite is $\mu \frac{E+M}{r^2}$ towards the planet along the radius vector r, where μ is the attraction between unit masses at unit distance apart.

Now, the centre of inertia of the planet and satellite remains fixed in space, and the centre of the planet describes an orbit round that centre of inertia, similar to that described by the satellite round the planet, but with linear dimensions reduced in the ratio M to $E+M$. Hence the acceleration of the planet's centre is $\mu \frac{M}{r^2}$ towards the centre of inertia of the two bodies. Thus, in order to reduce the planet's centre to rest, it is necessary to apply to each particle of the system an acceleration $\mu \frac{M}{r^2}$ parallel to r and directed from the satellite to the planet.

Now, let a set of rectangular axes fixed in the planet be taken, and let $M_1 r$, $M_2 r$, $M_3 r$ be the co-ordinates of the satellite referred to them, and let $\rho\xi$, $\rho\eta$, $\rho\zeta$ be the co-ordinates of the particle P whose radius vector is ρ.

Then the component accelerations for reducing the planet's centre to rest are

$$-\mu \frac{M.\,M_1}{r^2}, \quad -\mu \frac{M.\,M_2}{r^2}, \quad -\mu \frac{M.\,M_3}{r^2};$$

and since these are the differential co-efficients with regard to $\rho\xi$, $\rho\eta$, $\rho\zeta$ of the function

$$-\mu \frac{M\rho}{r^2}(M_1\xi + M_2\eta + M_3\zeta); \text{ and since } \cos z = M_1\xi + M_2\eta + M_3\zeta,$$

it follows that the potential of the forces, by which the planet's centre is reduced to rest, is $-\mu \frac{M\rho}{r^2}\cos z$.

The other forces acting on the particle must now be considered. The planet is spheroidal and therefore does not attract equally in all directions; but in this investigation of the forces, the ellipticity of the planet and the ellipticity of the ocean due to the planetary rotation may be neglected. Outside of its body, then, the planet contributes forces of which the potential is $\mu \frac{E}{\rho}$.

Next, the direct attraction of the satellite contributes forces of which the potential, being proportional to the mass of the satellite divided by the distance between the point P and the satellite, is

$$\mu \frac{M}{\sqrt{r^2 + \rho^2 - 2r\rho \cos z}}.$$

To determine the forces from this potential, ρ and z must be regarded as variables for differentiation, and a constant may be added to this potential at pleasure. As the object is to find the forces which urge P relatively to the planet, such a constant must be added, as will make the whole potential at the planet's centre zero, and thus the potential of the forces due to the attraction of the satellite must be taken as

$$\mu \frac{M}{\sqrt{r^2 + \rho^2 - 2r\rho \cos z}} - \mu \frac{M}{r}.$$

It is obvious that r is very large compared with ρ, so that the expression may be expanded in powers of $\frac{\rho}{r}$.

This expansion gives $$\mu \frac{M}{r} \left\{ \frac{\rho}{r} P_1 + \frac{\rho^2}{r^2} P_2 + \frac{\rho^3}{r^3} P_3 + \&c. \right\},$$

where $$P_1 = \cos z, \quad P_2 = \tfrac{3}{2} \cos^2 z - \tfrac{1}{2}, \quad P_3 = \tfrac{5}{2} \cos^3 z - \tfrac{3}{2} \cos z, \ \&c.$$

Now since $\mu \frac{M}{r} . \frac{\rho}{r} P_1 = \mu \frac{M\rho}{r^2} \cos z$, and is therefore equal and opposite to the potential by which the planet's centre was reduced to rest, the collection together of the various contributions to the potential gives as the potential of the forces acting on a particle, whose co-ordinates are $\rho\xi$, $\rho\eta$, $\rho\zeta$, the expression

$$\mu \frac{E}{\rho} + \mu \frac{M\rho^2}{r^3} (\tfrac{3}{2} \cos^2 z - \tfrac{1}{2}) + \mu \frac{M\rho^3}{r^4} (\tfrac{5}{2} \cos^3 z - \tfrac{3}{2} \cos z) + \&c. \quad . \quad . \quad . \quad (1)$$

The first term of (1) is the potential of gravity; consequently the terms of the series, of which two only are written, constitute the tide-generating potential, V, so that

$$V = \mu \frac{M\rho^2}{r^3} (\tfrac{3}{2} \cos^2 z - \tfrac{1}{2}) + \mu \frac{M\rho^3}{r^4} (\tfrac{5}{2} \cos^3 z - \tfrac{3}{2} \cos z) + \&c. \quad . \quad . \quad . \quad . \quad (2)$$

3.

Development of the Lunar Tides.

For the purpose of expansion, it will be more convenient to consider these two terms separately; so the tide-generating potential, due to the moon, of the second order of harmonics, at the point P is

$$V = \tfrac{3}{2} \frac{\mu M}{r^3} \rho^2 (\cos^2 z - \tfrac{1}{3}) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

Now, a simple tide may be defined as a spherical harmonic deformation of the waters of the ocean which executes a simple harmonic motion in time. Corresponding to this definition, the expression for each term of the tide-generating potential should consist of a solid spherical harmonic multiplied by a simple time-harmonic.

But since

$$\cos z = \xi M_1 + \eta M_2 + \zeta M_3, \quad \xi^2 + \eta^2 + \zeta^2 = 1 \quad \text{and } M_1^2 + M_2^2 + M_3^2 = 1,$$

$$\left.\begin{aligned}\cos^2 z - \tfrac{1}{3} &= (\xi M_1 + \eta M_2 + \zeta M_3)^2 - \tfrac{1}{3}(M_1^2 + M_2^2 + M_3^2)(\xi^2 + \eta^2 + \zeta^2) \\ &= 2\xi\eta\, M_1 M_2 + 2\,\frac{\xi^2-\eta^2}{2}.\,\frac{M_1^2-M_2^2}{2} + 2\eta\zeta\, M_2 M_3 + 2\xi\zeta\, M_1 M_3 \\ &\quad + \tfrac{3}{2}\,\frac{\xi^2+\eta^2-2\zeta^2}{3}.\,\frac{M_1^2+M_2^2-2M_3^2}{3}\end{aligned}\right\} \quad . \quad . \quad . \quad (4)$$

as will be seen by simply expanding the two expressions.

Now, let c be the moon's mean distance, e the eccentricity of the moon's orbit, and

$$\tau = \tfrac{3}{2}.\,\frac{\mu M}{c^3} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

Then putting

$$X = \left[\frac{c(1-e^2)}{r}\right]^{\frac{3}{2}} M_1, \quad Y = \left[\frac{c(1-e^2)}{r}\right]^{\frac{3}{2}} M_2, \quad Z = \left[\frac{c(1-e^2)}{r}\right]^{\frac{3}{2}} M_3 \quad . \quad . \quad . \quad (6)$$

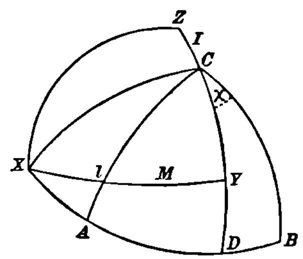
the expression in (3) becomes

$$\left.\begin{aligned}V \div \frac{\tau}{(1-e^2)^3}\,\rho^2 &= 2\xi\eta\, XY + 2\,\frac{\xi^2-\eta^2}{2}.\,\frac{X^2-Y^2}{2} \\ +2\eta\zeta\, YZ + 2\xi\zeta\, XZ &+ \tfrac{3}{2}\,\frac{\xi^2+\eta^2-2\zeta^2}{3}.\,\frac{X^2+Y^2-2Z^2}{3}\end{aligned}\right\} \quad . \quad . \quad . \quad . \quad (7)$$

In (7), $\rho^2\xi\eta$, $\rho^2(\xi^2-\eta^2)$, &c., are solid spherical harmonics, and in order to complete the expression for V, it is necessary to develop the five functions of X, Y, Z in a series of simple time-harmonics.

Let A, B, C (Fig. 1) be the axes of reference fixed in the earth, C being the north pole and AB being the equator.

Fig. 1.



Let X, Y, Z, be a second set of axes, XY being the plane of the moon's orbit.

Let M be the projection of the moon in her orbit,

$I = ZC$, the obliquity of the lunar orbit to the equator,

$\chi = AX = BCY$,

$l = MX$, the moon's longitude in her orbit, measured from X.

$$\left.\begin{aligned}\text{Then } M_1 &= \cos MA = \cos l \cos \chi + \sin l \sin \chi \cos I \\ M_2 &= \cos MB = -\cos l \sin \chi + \sin l \cos \chi \cos I \\ M_3 &= \cos MC = \sin l \sin I\end{aligned}\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (8)$$

So that if $\quad p = \cos \tfrac{1}{2} I \;$ and $\; q = \sin \tfrac{1}{2} I \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (9)$

equations (8) may be written

$$\left.\begin{aligned}M_1 &= p^2 \cos(\chi - l) + q^2 \cos(\chi + l) \\ M_2 &= -p^2 \sin(\chi - l) - q^2 \sin(\chi + l) \\ M_3 &= 2pq \sin l\end{aligned}\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (10)$$

Whence

$$\left.\begin{aligned} M_1^2-M_2^2 &= p^4\cos 2(\chi-l)+2p^2q^2\cos 2\chi+q^4\cos 2(\chi+l) \\ -2M_1M_2 &= \text{the same with sines instead of cosines} \\ M_2M_3 &= -p^3q\cos(\chi-2l)+pq(p^2-q^2)\cos\chi+pq^3\cos(\chi+2l) \\ M_1M_3 &= \text{the same with sines instead of cosines} \\ \frac{M_1^2+M_2^2-2M_3^2}{3} &= \tfrac{1}{3}(p^4-4p^2q^2+q^4)+2p^2q^2\cos 2l \end{aligned}\right\} \quad . \quad . \quad (11)$$

It will now be convenient to introduce certain auxiliary functions, namely

$$\Phi(a)=\left[\frac{c(1-e^2)}{r}\right]^3\cos(2l+a);\quad \Psi(a)=\left[\frac{c(1-e^2)}{r}\right]^3\cos a;\quad \mathrm{R}=\left[\frac{c(1-e^2)}{r}\right]^3 \quad . \quad . \quad (12)$$

Then from (6) and (11)

$$\left.\begin{aligned} X^2-Y^2 &= p^4\Phi(-2\chi)+2p^2q^2\Psi(2\chi)+q^4\Phi(2\chi) \\ 2XY &= \text{the same with } \chi+\tfrac{1}{4}\pi \text{ for } \chi \\ YZ &= -p^3q\Phi(-\chi)+pq(p^2-q^2)\Psi(\chi)+pq^3\Phi(\chi) \\ XZ &= \text{the same with } \chi-\tfrac{1}{2}\pi \text{ for } \chi \\ \tfrac{1}{3}(X^2+Y^2-2Z^2) &= \tfrac{1}{3}(p^4-4p^2q^2+q^4)\mathrm{R}+2p^2q^2\Phi(0) \end{aligned}\right\} \quad . \quad . \quad . \quad . \quad (13)$$

Thus, when the functions Φ, Ψ, R are expressed in a series of time-harmonics, the further development of the X, Y, Z functions consists in substitution in (13).

It will now be supposed that the moon moves in an elliptic orbit, undisturbed by the sun; the tides which arise from the lunar inequalities of the Evection and Variation will be the subject of separate treatment below.

The descending node of the equator on the lunar orbit will be called 'the Intersection.'

Let σ_1 be the moon's mean longitude measured in her orbit from the Intersection,

ϖ_1 ,, longitude of the perigee measured in the same way,

and l has already been defined as the longitude of the moon in her orbit, measured from the Intersection.

The equation of the ellipse described by the moon is

$$\frac{c(1-e^2)}{r}=1+e\cos(l-\varpi_1) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (14)$$

If higher powers of e than the second be neglected,

$$\left.\begin{aligned} \mathrm{R} &= 1+\tfrac{3}{2}e^2+3e\cos(l-\varpi_1)+\tfrac{3}{2}e^2\cos 2(l-\varpi_1) \\ \Phi(a) &= \mathrm{R}\cos(2l+a) \\ &= (1+\tfrac{3}{2}e^2)\cos(2l+a)+\tfrac{3}{2}e\left[\cos(3l+a-\varpi_1)+\cos(l+a+\varpi_1)\right] \\ &\quad+\tfrac{3}{4}e^2\left[\cos(4l+a-2\varpi_1)+\cos(a+2\varpi_1)\right] \\ \Psi(a) &= \mathrm{R}\cos a \end{aligned}\right\} \quad . \quad . \quad (15)$$

And by the theory of elliptic motion (see Godfray's Lunar Theory, third edition, page 12)

$$l=\sigma_1+2e\sin(\sigma_1-\varpi_1)+\tfrac{5}{4}e^2\sin 2(\sigma_1-\varpi_1) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

Consequently, in order to expand Φ, Ψ, R in terms of σ_1 (which increases uniformly with the time), $\cos(2l+a)$ must be developed as far as e^2; $\cos(3l+a-\varpi_1)$, $\cos(l+a+\varpi_1)$ and $\cos(l-\varpi_1)$ as far as e; while only the first terms of $\cos(4l+a-2\varpi_1)$ and $\cos 2(l-\varpi_1)$ are necessary.

Substituting for l the value given in (16), and remembering that $\cos\theta = 1 - \frac{\theta^2}{2}$ and $\sin\theta = \theta$ to the order of small quantities here employed, it is easy to show that

$$\begin{aligned}
\cos(2l+a) &= (1-4e^2)\cos(2\sigma_1+a) - 2e\cos(\sigma_1+a+\varpi_1) + 2e\cos(3\sigma_1+a-\varpi_1)\\
&\quad + \tfrac{3}{4}e^2\cos(a+2\varpi_1) + \tfrac{13}{4}e^2\cos(4\sigma_1+a-2\varpi_1),\\
\cos(3l+a-\varpi_1) &= \cos(3\sigma_1+a-\varpi_1) - 3e\cos(2\sigma_1+a) + 3e\cos(4\sigma_1+a-2\varpi_1),\\
\cos(l+a+\varpi_1) &= \cos(\sigma_1+a+\varpi_1) + e\cos(2\sigma_1+a) - e\cos(a+2\varpi_1),\\
\cos(l-\varpi_1) &= -e + \cos(\sigma_1-\varpi_1) + e\cos 2(\sigma_1-\varpi_1),\\
\cos(4l+a-2\varpi_1) &= \cos(4\sigma_1+a-2\varpi_1),\\
\cos 2(l-\varpi_1) &= \cos 2(\sigma_1-\varpi_1).
\end{aligned}$$

Substituting these values in (15) the expressions become

$$\left.\begin{aligned}
\Phi(a) &= (1-\tfrac{11}{2}e^2)\cos(2\sigma_1+a) - \tfrac{1}{2}e\cos(\sigma_1+a+\varpi_1) + \tfrac{7}{2}e\cos(3\sigma_1+a-\varpi_1)\\
&\quad + \tfrac{17}{2}e^2\cos(4\sigma_1+a-2\varpi_1)\\
R &= (1-\tfrac{3}{2}e^2) + 3e\cos(\sigma_1-\varpi_1) + \tfrac{9}{2}e^2\cos 2(\sigma_1-\varpi_1)\\
\Psi(a) &= (1-\tfrac{3}{2}e^2)\cos a + \tfrac{3}{2}e\left[\cos(\sigma_1+a-\varpi_1)+\cos(\sigma_1-a-\varpi_1)\right]\\
&\quad + \tfrac{9}{4}e^2\left[\cos(2\sigma_1+a-2\varpi_1)+\cos(2\sigma_1-a-2\varpi_1)\right]
\end{aligned}\right\} \quad . \quad . \quad (17)$$

Now substituting from (17) in (13), and giving to a its appropriate value,

$$\left.\begin{aligned}
X^2 - Y^2 &= (1-\tfrac{11}{2}e^2)\left[p^4\cos 2(\chi-\sigma_1) + q^4\cos 2(\chi+\sigma_1)\right] + (1-\tfrac{3}{2}e^2)\,2p^2q^2\cos 2\chi\\
&\quad + \tfrac{7}{2}e\left[p^4\cos(2\chi-3\sigma_1+\varpi_1) + q^4\cos(2\chi+3\sigma_1-\varpi_1)\right]\\
&\quad - \tfrac{1}{2}e\left[p^4\cos(2\chi-\sigma_1-\varpi_1) + q^4\cos(2\chi+\sigma_1+\varpi_1)\right]\\
&\quad + \tfrac{3}{2}e\,2p^2q^2\left[\cos(2\chi+\sigma_1-\varpi_1) + \cos(2\chi-\sigma_1+\varpi_1)\right]\\
&\quad + \tfrac{17}{2}e^2\left[p^4\cos(2\chi-4\sigma_1+2\varpi_1) + q^4\cos(2\chi+4\sigma_1-2\varpi_1)\right]\\
&\quad + \tfrac{9}{4}e^2\,2p^2q^2\left[\cos(2\chi+2\sigma_1-2\varpi_1) + \cos(2\chi-2\sigma_1+2\varpi_1)\right]
\end{aligned}\right\} \quad . \quad (18)$$

Also $-2XY$ is the same as (18) with sines instead of cosines, and YZ is the same as $X^2 - Y^2$ when χ replaces 2χ, $-p^3q$ replaces p^4, $pq\,(p^2-q^2)$ replaces $2p^2q^2$, and pq^3 replaces q^4, and XZ is the same as YZ with sines instead of cosines; so that

$$\left.\begin{aligned}
XZ &= -(1-\tfrac{11}{2}e^2)\left[p^3q\sin(\chi-2\sigma_1) - pq^3\sin(\chi+2\sigma_1)\right] + (1-\tfrac{3}{2}e^2)\,pq\,(p^2-q^2)\sin\chi\\
&\quad - \tfrac{7}{2}e\left[p^3q\sin(\chi-3\sigma_1+\varpi_1) - pq^3\sin(\chi+3\sigma_1-\varpi_1)\right]\\
&\quad + \tfrac{1}{2}e\left[p^3q\sin(\chi-\sigma_1-\varpi_1) - pq^3\sin(\chi+\sigma_1+\varpi_1)\right]\\
&\quad + \tfrac{3}{2}e\,pq\,(p^2-q^2)\left[\sin(\chi+\sigma_1-\varpi_1) + \sin(\chi-\sigma_1+\varpi_1)\right]\\
&\quad - \tfrac{17}{2}e^2\left[p^3q\sin(\chi-4\sigma_1+2\varpi_1) - pq^3\sin(\chi+4\sigma_1-2\varpi_1)\right]\\
&\quad + \tfrac{9}{4}e^2pq\,(p^2-q^2)\left[\sin(\chi+2\sigma_1-2\varpi_1) + \sin(\chi-2\sigma_1+2\varpi_1)\right]
\end{aligned}\right\} \quad . \quad (19)$$

and

$$\left.\begin{aligned}
&\tfrac{1}{3}(X^2+Y^2-2Z^2) = \tfrac{1}{3}(p^4-4p^2q^2+q^4)\left[(1-\tfrac{3}{2}e^2) + 3e\cos(\sigma_1-\varpi_1) + \tfrac{9}{2}e^2\cos 2(\sigma_1-\varpi_1)\right]\\
&\quad + 2p^2q^2\left[(1-\tfrac{11}{2}e^2)\cos 2\sigma_1 + \tfrac{7}{2}e\cos(3\sigma_1-\varpi_1) - \tfrac{1}{2}e\cos(\sigma_1+\varpi_1) + \tfrac{17}{2}e^2\cos(4\sigma_1-2\varpi_1)\right]
\end{aligned}\right\}. \quad (20)$$

An approximation will now be made with regard to I, the obliquity of the lunar orbit to the equator.

The obliquity of the ecliptic is 23° 27′·3, and I oscillates between 5° 8′·8 greater and 5° 8′·8 less than this value. The value of q or $\sin \frac{1}{2}I$, when I is 23° 27′·3, is ·203; its square is ·041 and its cube ·0084. The eccentricity of the lunar orbit e is ·0549; hence q^2 is a little smaller than e.

The preceding developments have been carried as far as e^2, principally on account of the terms involving $\frac{17}{2}e^2$, which, as e is about $\frac{1}{18}$, have nearly the same magnitude as if the coefficient had been $\frac{1}{2}e$.

It is proposed to regard q^2 and q^3 as of the same order as e, and to drop all terms of the order e^2, except in the case where the numerical factor is large. This rule will be neglected with regard to one term for a special reason, which appears below; and with regard to another, because the numerical coefficient is just sufficiently large to make it worth retaining.

Adopting this approximation (18), (19) and (20) may be written—

$$\left.\begin{aligned}
X^2 - Y^2 &= (1 - \tfrac{11}{2}e^2)\,p^4 \cos 2(\chi - \sigma_1) + (1 - \tfrac{3}{2}e^2)\,2p^2q^2 \cos 2\chi + \tfrac{7}{2}e\,p^4 \cos(2\chi - 3\sigma_1 + \varpi_1) \\
&\quad - \tfrac{1}{2}ep^2\left[p^2 \cos(2\chi - \sigma_1 - \varpi_1) - 6q^2 \cos(2\chi - \sigma_1 + \varpi_1)\right] + \tfrac{17}{2}e^2p^4 \cos(2\chi - 4\sigma_1 + 2\varpi_1) \\
XZ &= -(1 - \tfrac{11}{2}e^2)\left[p^3q \sin(\chi - 2\sigma_1) - pq^3 \sin(\chi + 2\sigma_1)\right] + (1 - \tfrac{3}{2}e^2)\,pq\,(p^2 - q^2) \sin\chi \\
&\quad - \tfrac{7}{2}ep^3q \sin(\chi - 3\sigma_1 + \varpi_1) + \tfrac{1}{2}epq\left[p^2 \sin(\chi - \sigma_1 - \varpi_1) + 3(p^2 - q^2) \sin(\chi - \sigma_1 + \varpi_1)\right] \\
&\quad + \tfrac{3}{2}epq\,(p^2 - q^2) \sin(\chi + \sigma_1 - \varpi_1) - \tfrac{17}{2}e^2p^3q \sin(\chi - 4\sigma_1 + 2\varpi_1) \\
\tfrac{1}{3}(X^2 + Y^2 - 2Z^2) &= \tfrac{1}{3}(p^4 - 4p^2q^2 + q^4)\left[(1 - \tfrac{3}{2}e^2) + 3e \cos(\sigma_1 - \varpi_1)\right] \\
&\qquad + 2p^2q^2\left[(1 - \tfrac{11}{2}e^2) \cos 2\sigma_1 + \tfrac{7}{2}e \cos(3\sigma_1 - \varpi_1)\right]
\end{aligned}\right\} \quad (21)$$

The terms which have been retained in violation of the rule of approximation are that in $X^2 - Y^2$ with argument $2\chi - \sigma_1 + \varpi_1$, and that in $\frac{1}{3}(X^2 + Y^2 - 2Z^2)$ with argument $3\sigma_1 - \varpi_1$.

The only other term which could have any importance is

$$\tfrac{3}{2}e\, 2p^2q^2 \cos(2\chi + \sigma_1 - \varpi_1) \text{ in } X^2 - Y^2.$$

Two pairs of terms in the expressions (21) may be further reduced.

Firstly, in $X^2 - Y^2$ there is a pair of terms

$$-\tfrac{1}{2}ep^2\left[p^2 \cos(2\chi - \sigma_1 - \varpi_1) - 6q^2 \cos(2\chi - \sigma_1 + \varpi_1)\right].$$

The expression within the brackets may be written

$$(p^2 - 6q^2 \cos 2\varpi_1) \cos(2\chi - \sigma_1 - \varpi_1) + 6q^2 \sin 2\varpi_1 \sin(2\chi - \sigma_1 - \varpi_1)$$

$$= p\sqrt{p^2 - 12q^2 \cos 2\varpi_1}\, \cos(2\chi - \sigma_1 - \varpi_1 - R) \text{ approximately,}$$

where

$$\tan R = \frac{\sin 2\varpi_1}{\frac{1}{6}\cot^2 \frac{1}{2}I - \cos 2\varpi_1} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (21')$$

Thus this pair of terms may be written

$$-\tfrac{1}{2}ep^4\sqrt{1 - 12\tan^2 \tfrac{1}{2}I \cos 2\varpi_1}\, \cos(2\chi - \sigma_1 - \varpi_1 - R) \quad . \quad . \quad . \quad (21'')$$

Secondly, in XZ there are the terms

$$+\tfrac{1}{2}epq\left[p^2 \sin(\chi - \sigma_1 - \varpi_1) + 3(p^2 - q^2) \sin(\chi - \sigma_1 + \varpi_1)\right],$$

which is approximately equal to

$$\tfrac{1}{2}ep^3q\,[4\cos\varpi_1\sin(\chi-\sigma_1)+2\sin\varpi_1\cos(\chi-\sigma_1)],$$

or
$$ep^3q\sqrt{\tfrac{5}{2}+\tfrac{3}{2}\cos 2\varpi_1}\,\sin(\chi-\sigma_1+Q) \qquad (21^{iii})$$

where
$$\tan Q=\tfrac{1}{2}\tan\varpi_1 \qquad (21^{iv})$$

The object of the transformations (21^{ii}) and (21^{iii}), which may seem theoretically undesirable, is as follows:—

The numerical harmonic analysis of the tides is made to extend over one year, and this period is not long enough to distinguish completely a tide whose argument is $2\chi-\sigma_1-\varpi_1$, from one whose argument is $2\chi-\sigma_1+\varpi_1$, nor one whose argument is $\chi-\sigma_1-\varpi_1$, from one whose argument is $\chi-\sigma_1+\varpi_1$. In fact, the tide whose argument is $2\chi-\sigma_1+\varpi_1$ (for which no analysis has as yet been carried out) will only produce an irregularity in that of argument $2\chi-\sigma_1-\varpi_1$, called the smaller elliptic semi-diurnal tide.

Again, the pair of terms with arguments $\chi-\sigma_1\pm\varpi_1$ will appear in the harmonic analysis with the single argument $\chi-\sigma_1$, and the resulting numbers will necessarily appear very irregular, unless compared with the theoretical expression (21^{iii}).

The terms introduced by the two principal lunar inequalities due to the disturbing action of the sun, the 'Evection' and the 'Variation,' will now be considered.

4.

Terms due to the Evection.

Let θ be the moon's longitude in the ecliptic,
s „ „ mean longitude,
p „ mean longitude of the perigee,*
h „ sun's mean longitude,
m „ ratio of the sun's to the moon's mean motion.

Then, as shown in Godfray's Lunar Theory, third edition, arts. 76 and 92, the inequality in longitude and radius vector, to which the name 'Evection' has been given, is represented by

$$\theta=s+\tfrac{15}{4}me\sin(s-2h+p) \qquad (22)$$

$$\frac{c(1-e^2)}{r}=1+\tfrac{15}{8}me\cos(s-2h+p) \qquad (23)$$

Now if no distinction is made between longitudes in the orbit and in the ecliptic, that is neglecting a term whose coefficient $\sin^2(\tfrac{1}{2}\times 5^\circ\,9')$ is $\cdot 002$ or less than e^2,

then
$$l=\sigma_1+\tfrac{15}{4}me\sin(s-2h+p).$$

Now m is about $\tfrac{1}{13}$ and therefore only a little greater than e, so that

$$\cos(2l+a)=\cos(2\sigma_1+a)+\tfrac{15}{4}me\,[\cos(2\sigma_1+s-2h+p+a)-\cos(2\sigma_1-s+2h-p+a)].$$

* This symbol also denotes cos $\tfrac{1}{2}I$, but its use in this sense will shortly be discarded.

Hence

$$R = \left[\frac{c(1-e^2)}{r}\right]^3 = 1 + \tfrac{45}{8} me \cos(s - 2h + p) \quad . \quad . \quad . \quad (24)$$

$$\Psi(a) = R\cos a = \cos a + \tfrac{45}{16} me\,[\cos(s - 2h + p + a) + \cos(s - 2h + p - a)] \quad . \quad . \quad (25)$$

$$\Phi(a) = R\cos(2l + a) = \cos(2\sigma_1 + a) + \tfrac{105}{16} me \cos(2\sigma_1 + s - 2h + p + a)$$
$$- \tfrac{15}{16} me \cos(2\sigma - s + 2h - p + a) \quad . \quad . \quad (26)$$

Substituting these in (13) and neglecting terms which are nearly a reproduction of those already obtained and also those in q^2 and q^3, the additional terms due to the evection become

$$\left.\begin{aligned} X^2 - Y^2 &= \tfrac{105}{16} mep^4 \cos(2\chi - 2\sigma_1 - s + 2h - p) - \tfrac{15}{16} mep^4 \cos(2\chi - 2\sigma_1 + s - 2h + p) \\ XZ &= -\tfrac{105}{16} mep^3 q \sin(\chi - 2\sigma_1 - s + 2h - p) + \tfrac{15}{16} mep^3 q \sin(\chi - 2\sigma_1 + s - 2h + p) \\ &\quad + \tfrac{45}{16} mepq\,(p^2 - q^2)\,[\sin(\chi + s - 2h + p) + \sin(\chi - s + 2h - p)] \\ \tfrac{1}{3}(X^2 + Y^2 - 2Z^2) &= \tfrac{1}{3}(p^4 - 4p^2q^2 + q^4)\,\tfrac{45}{8} me \cos(s - 2h + p) \end{aligned}\right\} \quad (27)$$

The term $\frac{105}{16}me$ arises from the addition of the coefficient of the Evection in the longitude to three-halves of that in the reciprocal of the radius vector, the term $\frac{15}{16}me$ from the subtraction of the same two quantities, and the term $\frac{45}{8}me$ is three times the coefficient in the reciprocal of the radius vector. When the development of the lunar theory is carried to higher orders, these coefficients differ considerably from the amounts computed from the first term, which alone occurs in the above analysis. Hence, when these coefficients are computed, the full values of coefficients in longitude and reciprocal of the radius vector must be introduced. According to Professor Adams, the full values of the coefficients are, in longitude ·022233, and in c/r ·010022.

Now, as stated above, m is about $\frac{1}{13}$ and is therefore a little greater than e, so that me is somewhat greater than e^2. Thus the terms to be added on account of the evection may be abridged and written

$$\left.\begin{aligned} X^2 - Y^2 &= \tfrac{105}{16} mep^4 \cos(2\chi - 2\sigma_1 - s + 2h - p) - \tfrac{15}{16} mep^4 \cos(2\chi - 2\sigma_1 + s - 2h + p) \\ XZ &= -\tfrac{105}{16} mep^3 q \sin(\chi - 2\sigma_1 - s + 2h - p) \\ \tfrac{1}{3}(X^2 + Y^2 - 2Z^2) &= \tfrac{1}{3}(p^4 - 4p^2q^2 + q^4)\,\tfrac{45}{8} me \cos(s - 2h + p) \end{aligned}\right\}. \quad (28)$$

5.

Terms due to the Variation.

The expressions for the inequality known as the 'Variation' in longitude and reciprocal of the radius vector are given in Godfray's Lunar Theory, third edition, arts. 79 and 93. If, as before, no distinction is made between longitudes in the orbit and in the ecliptic, these reduce to:—

$$l = \sigma_1 + \tfrac{11}{8} m^2 \sin 2(s - h),$$

$$\frac{c(1-e^2)}{r} = 1 + m^2 \cos 2(s - h).$$

So that

$$R = 1 + 3m^2 \cos 2(s - h).$$

$$\Psi(a) = \cos a + \tfrac{3}{2} m^2 [\cos(2s - 2h + a) + \cos(2s - 2h - a)],$$

$$\Phi(a) = \cos(2\sigma_1 + a) + \tfrac{23}{8} m^2 \cos(2\sigma_1 + 2s - 2h + a) + \tfrac{1}{8} m^2 \cos(2\sigma_1 - 2s + 2h + a).$$

Whence to a sufficient degree of approximation,

$$\left.\begin{aligned} X^2 - Y^2 &= \tfrac{23}{8} m^2 p^4 \cos(2\chi - 2\sigma_1 - 2s + 2h) \\ XZ &= 0 \\ \tfrac{1}{3}(X^2 + Y^2 - 2Z^2) &= \tfrac{1}{3}(p^4 - 4p^2q^2 + q^4)\, 3m^2 \cos(2s - 2h) \end{aligned}\right\} \quad . \quad . \quad . \quad (29)$$

In this case, the value of the coefficient in $X^2 - Y^2$ is the sum of the coefficient in longitude and three-halves of that in reciprocal radius vector; in $\frac{1}{3}(X^2 + Y^2 - Z^2)$ it is three times that in reciprocal radius vector. But the actual values of the coefficients are considerably greater than those computed from the first terms and in computing, the actual values of the above coefficients must be used. According to Professor Adams these are, in longitude ·011489, and in c/r ·008249.

6.

Further Development of the Lunar Tides.

The complete expressions for the X-Y-Z functions have now been obtained in (21), (28) and (29) in a series of simple time-harmonics; but they are not yet in a form to which the ordinary astronomical formulæ are adopted: further substitutions must be made before passing from the potential to the height of the tide generated by that potential.

The axes fixed in the earth may be taken to have their extremities in the following positions:—

The axis of A on the equator, in the meridian of the place of observation of the tides,

B on the equator 90° East of A,

C at the north pole.

Now ξ, η, ζ are the direction-cosines of the place of observation, so that, if λ be the latitude of that place,

$$\xi^2 - \eta^2 = \cos^2\lambda, \quad \xi\eta = 0, \quad \eta\zeta = 0, \quad 2\xi\zeta = \sin 2\lambda \quad \text{and} \quad \tfrac{1}{3}(\xi^2 + \eta^2 - 2\zeta^2) = \tfrac{1}{3} - \sin^2\lambda.$$

Then, if a is written for the radius of the earth, the expression (7) for V at the place of observation becomes

$$V = \frac{\tau a^2}{(1 - e^2)^3}\left[\tfrac{1}{2}\cos^2\lambda (X^2 - Y^2) + \sin 2\lambda\, XZ + \tfrac{3}{2}(\tfrac{1}{3} - \sin^2\lambda)\, \tfrac{1}{3}(X^2 + Y^2 - 2Z^2)\right].$$

The X-Y-Z functions being simple time-harmonics, the principle of forced oscillations, stated on page 4, justifies the conclusion that the forces corresponding to V will generate oscillations in the ocean of the same periods and types as the terms in V, but of unknown amplitudes and phases.

If now, $\mathfrak{X}^2 - \mathfrak{Y}^2$, $\mathfrak{X}\mathfrak{Z}$, $\frac{1}{3}(\mathfrak{X}^2 + \mathfrak{Y}^2 - 2\mathfrak{Z}^2)$ be three functions having forms respectively similar to those of

$$\frac{X^2 - Y^2}{(1 - e^2)^3}, \quad \frac{XZ}{(1 - e^2)^3}, \quad \frac{1}{3}\frac{(X^2 + Y^2 - 2Z^2)}{(1 - e^2)^3},$$

but differing from them in that the argument of each of the simple time-harmonics has some angle subtracted from it, and that the term is multiplied by a numerical factor: then, by means of the above principle, h, the height of the tide at the place of observation is given by

$$h = \frac{\tau a^2}{g}\left[\tfrac{1}{2}\cos^2\lambda(\mathfrak{X}^2 - \mathfrak{Y}^2) + \sin 2\lambda\, \mathfrak{X}\mathfrak{Z} + \tfrac{3}{2}(\tfrac{1}{3} - \sin^2\lambda)\, \tfrac{1}{3}(\mathfrak{X}^2 + \mathfrak{Y}^2 - 2\mathfrak{Z}^2)\right] \quad . \quad . \quad (30)$$

where g denotes gravity.

The selection of the factor $\frac{\tau a^2}{g}$, which may be more conveniently written $\frac{3}{2}\frac{M}{E}\left(\frac{a}{c}\right)^3 a$, is due to the consideration that, if the equilibrium theory of the tides with water covering the whole earth were correct, by its introduction each of the numerical factors in the $\mathfrak{X}$-$\mathfrak{Y}$-$\mathfrak{Z}$ functions would become unity and the alterations of phase would also become zero; or, with land and sea as in reality, they might be computed by means of the five definite integrals involved in Sir William Thomson's amended equilibrium theory of tides given in Thomson and Tait's 'Natural Philosophy.'

The actual results of tidal analysis at any place are presented, as will be afterwards explained, in a series of terms of the form $f\mathrm{H}\cos(V + u - \kappa)$, where dV/dt or n, 'the speed,' is the rate of increase of the argument per unit of time (say degrees per mean solar hour), and u is a constant. All the terms of the $\mathfrak{X}$-$\mathfrak{Y}$-$\mathfrak{Z}$ functions must consequently be presented as cosines with a positive sign. When, therefore in these functions a negative cosine occurs, its sign must be changed and π added to the argument: as the $\mathfrak{XZ}$ functions involve sines, $\frac{1}{2}\pi$ must be added to the arguments of the negative signs, and subtracted from those of the positive ones and the sines replaced by cosines. The terms in the $\frac{1}{3}(\mathfrak{X}^2 + \mathfrak{Y}^2 - 2\mathfrak{Z}^2)$ function require special consideration. The function of the latitude being $\frac{1}{3} - \sin^2\lambda$, it follows that when in the northern hemisphere it is high water north of a certain critical latitude, it is low water on the opposite side of that parallel; and the same is true for the southern hemisphere. The critical latitude is that in which $\sin^2\lambda = \frac{1}{3}$, or, in Thomson's amended equilibrium theory, where $\sin^2\lambda = \frac{1}{3}(1 + \mathfrak{E})$. An approximate evaluation of $\mathfrak{E}$, which depends on the distribution of the land and sea, given in Thomson and Tait's 'Natural Philosophy,' para. 848 of the second edition, shows that the critical latitudes are 35° N. and S. It will be best to adopt a uniform system for the whole earth, and to regard high tide and high water as consentaneous in the equatorial belt, and of opposite meanings outside of the critical latitudes. The function will, therefore, be always written $\frac{1}{3} - \sin^2\lambda$, so that outside of the critical latitudes high tide is low water. Accordingly π must be added to the arguments of the negative cosines (if any) which occur in the function $\frac{1}{3}(\mathfrak{X}^2 + \mathfrak{Y}^2 - 2\mathfrak{Z}^2)$.

In continuing the development, the $\mathfrak{X}$-$\mathfrak{Y}$-$\mathfrak{Z}$ functions will be written in the form appropriate to the equilibrium theory, with the water covering the whole earth; for the actual case, it is only necessary to multiply by the reducing factor, and to subtract the phase alteration κ. As these are unknown constants for each place, they would only occur in the development as symbols of quantities to be deduced from observation. It will be understood, therefore, that in the following schedules 'the argument' is that part of the argument which is derived from theory, the true complete argument being 'the argument' diminished by κ, where κ is derived from observation.

Following this plan, since $\mathfrak{X}^2 - \mathfrak{Y}^2 = (1 + 3e^2)(X^2 - Y^2)$, &c., the results collected from (21), (28) and (29) give

$$\begin{aligned}\mathfrak{X}^2 - \mathfrak{Y}^2 = {} & (1 - \tfrac{5}{2}e^2)p^4\cos 2(\chi - \sigma_1) + (1 + \tfrac{3}{2}e^2)2p^2q^2\cos 2\chi + \tfrac{7}{2}ep^4\cos(2\chi - 3\sigma_1 + \varpi_1) \\ & + \tfrac{1}{2}ep^4\sqrt{\{1 - 12\tan^2\tfrac{1}{2}I\cos 2\varpi_1\}}\cos(2\chi - \sigma_1 - \varpi_1 - R + \pi) \\ & + \tfrac{17}{2}e^2p^4\cos(2\chi - 4\sigma_1 + 2\varpi_1) \\ & + \tfrac{105}{16}mep^4\cos(2\chi - 2\sigma_1 - s + 2h - p) \\ & + \tfrac{15}{16}mep^4\cos(2\chi - 2\sigma_1 + s - 2h + p + \pi) \\ & + \tfrac{23}{8}m^2p^4\cos(2\chi - 2\sigma_1 - 2s + 2h) \qquad (31)\end{aligned}$$

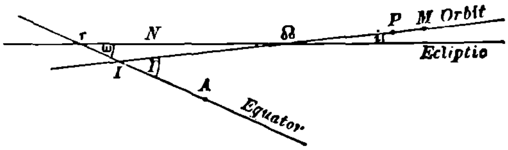
$$\begin{aligned}\mathfrak{XZ} = {} & (1 - \tfrac{5}{2}e^2)[p^3q\cos(\chi - 2\sigma_1 + \tfrac{1}{2}\pi) + pq^3\cos(\chi + 2\sigma_1 - \tfrac{1}{2}\pi)] \\ & + (1 + \tfrac{3}{2}e^2)pq(p^2 - q^2)\cos(\chi - \tfrac{1}{2}\pi) \\ & + \tfrac{7}{2}ep^3q\cos(\chi - 3\sigma_1 + \varpi_1 + \tfrac{1}{2}\pi) + ep^3q\sqrt{\{\tfrac{5}{2} + \tfrac{3}{2}\cos 2\varpi_1\}}\cos(\chi - \sigma_1 + Q - \tfrac{1}{2}\pi) \\ & + \tfrac{3}{2}epq(p^2 - q^2)\cos(\chi + \sigma_1 - \varpi_1 - \tfrac{1}{2}\pi) \\ & + \tfrac{17}{2}e^2p^3q\cos(\chi - 4\sigma_1 + 2\varpi_1 + \tfrac{1}{2}\pi) \\ & + \tfrac{105}{16}mep^3q\cos(\chi - 2\sigma_1 - s + 2h - p + \tfrac{1}{2}\pi) \qquad (32)\end{aligned}$$

$$\tfrac{1}{3}(X^2 + Y^2 - 2Z^2) = \tfrac{1}{3}(p^4 - 4p^2q^2 + q^4)\left[1 + \tfrac{3}{2}e^2 + 3e\cos(\sigma_1 - \varpi_1) + \tfrac{45}{8}me\cos(s - 2h + p)\right.$$
$$\left. + 3m^2\cos(2s - 2h)\right] + 2p^2q^2\left[(1 - \tfrac{5}{2}e^2)\cos 2\sigma_1 + \tfrac{7}{2}e\cos(3\sigma_1 - \varpi_1)\right] \quad . \quad . \quad (33)$$

The second step is to express the angles χ, σ_1, ϖ_1, each of which increases uniformly with the time, in terms of the sidereal hour-angle or of the local mean time, and of the mean longitudes of the moon and of the perigee.

Let M be the moon in the orbit,
- A „ extremity of the A-axis fixed in the earth,
- g „ sidereal hour-angle,
- N „ longitude of the node ☊,
- ν „ right ascension of the intersection I,
- ξ „ longitude in 'the moon's orbit' of the intersection,
- i „ inclination of the moon's orbit to the ecliptic,
- ω „ obliquity of the ecliptic,
- s „ moon's mean longitude,
- p „ mean longitude of the perigee.*

Fig. 2.



Then (Fig. 2) $g = A♈$, $\nu = ♈I$, $\xi = ♈☊ - ☊I$, $N = ♈☊$.

Now σ_1 and ϖ_1 have been defined above as the moon's mean longitude and the longitude of the perigee, both measured in the orbit from the intersection I.

Therefore $\sigma_1 - \varpi_1 =$ moon's mean anomaly $= s - p$.

Then if P (Fig. 2) be the perigee, supposed to describe the orbit with uniform motion,

$$p = ♈☊ + ☊P,$$

but

$$\xi = ♈☊ - ☊I,$$

so that

$$p - \xi = IP.$$

Therefore

$$\left.\begin{aligned} \varpi_1 &= p - \xi \\ \sigma_1 &= s - \xi \end{aligned}\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (34)$$

and

Again

$$\chi = IA = A♈ - I♈ = g - \nu \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (35)$$

where g is supposed to increase uniformly from the time when the tidal observations begin.

Since, in all tidal observations, local mean solar time is used, it will be better to express g in terms of local mean solar time and the sun's mean longitude.

Let t be the local mean solar time reduced to angle, so that at noon $t = 0°$,
- h „ sun's mean longitude,
- p_1 „ longitude of the sun's perigee.

Then

$$\chi = t + h - \nu \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (36)$$

---

* To be distinguished from p representing $\cos \frac{1}{2} I$.

If the values in (34) and (36) be substituted in the $\mathfrak{X}$-$\mathfrak{Y}$-$\mathfrak{Z}$ functions in (31), (32) and (33) and the functions in their new forms be introduced into (30), the final result may be expressed in the form of three schedules B, i, B, ii, B, iii (pages 46 and 47).

The schedules are arranged thus. First, there is a general coefficient $\frac{3}{2}\frac{M}{E}\left(\frac{a}{c}\right)^3 a$, which multiplies every term of all the schedules. Secondly, there are general coefficients, one for each schedule, *viz.*, $\cos^2\lambda$ for those in B, i which are evidently semi-diurnal, $\sin 2\lambda$ for those in B, ii which are diurnal, and $\frac{1}{2} - \frac{3}{2}\sin^2\lambda$ for those in B, iii or the terms of long period. These three functions of the latitude of the place of observation are the values at that place of three surface spherical harmonic functions, which have the maximum value unity, at the equator for the semi-diurnal, in latitude 45° for the diurnal, and at the pole for the terms of long period.

Then follows a table for each schedule, the first column giving the name or initial of the tide and the second the coefficient peculiar to the tide, a function of I and e, and in two cases also of p.

The third column gives the mean value of the coefficient or the mean semi-range of the corresponding term. It will be shown below, that these mean values are found by putting $I = \omega$ in the coefficient, and when the function of I is $\cos^4 \frac{1}{2} I$, $\sin I \cos^2 \frac{1}{2} I$, $\sin I \sin^2 \frac{1}{2} I$, or $\sin^2 I$ (in B, iii) by multiplying further by $\cos^4 \frac{1}{2} i$, and where the function of I is $\sin^2 I$ (in B, i), $\sin I \cos I$, or $1 - \frac{3}{2}\sin^2 I$ by multiplying by $1 - \frac{3}{2}\sin^2 i$.

Next there is a column of arguments, which are all linear functions of t, h, s, p, ν and ξ: in B, i, $2t + 2(h - \nu)$ and in B, ii, $t + (h - \nu)$ is common to all the arguments and is written at the top of the column; the terms in the arguments are grouped in a manner convenient for subsequent computations.

The last two columns of the table show the speed, that is, the rate of increase of the arguments in the preceding column, expressed algebraically and in degrees per mean solar hour; the letters γ, σ, η, ϖ refer respectively to the earth's angular velocity of rotation, to the mean motions of the moon, sun and lunar perigee.

To write down any term, the general coefficient, the coefficient for the schedule, the coefficient peculiar to the tide and the cosine of the argument must be multiplied together. The result is a term in the equilibrium tide with the water covering the whole earth, and the transition to the actual case by the introduction of a factor and a delay of phase, to be derived from observation, has already been explained.

7.

Solar Tides.

The expression for the tides depending on the sun, may be written down at once by symmetry; and, as the eccentricity of the solar orbit, *viz.*, ·01679, is so small, the elliptic tides may be omitted, excepting the larger elliptic semi-diurnal tide.

The lunar schedules are therefore to be transformed by writing $s = h$, $p = p_1$, $\xi = \nu = 0$, $\sigma = \eta$, $I = \omega$, $e = e_1$ and $\varpi = \varpi_1$, where ϖ_1 is the mean motion of the sun's perigee.

For purposes of comparison, the general coefficient $\frac{3}{2}\frac{M}{E}\left(\frac{a}{c}\right)^3 a$ will be retained in the schedule of solar tides, and the coefficient peculiar to each tide will be made to involve the factor $\frac{\tau_1}{\tau}$, where $\tau_1 = \frac{3}{2}\frac{\mu S}{c_1^3}$, S being the sun's mass, and c_1 the mean distance of the earth and sun, so that $\frac{\tau_1}{\tau} = \frac{S}{M}\left(\frac{c}{c_1}\right)^3$.

Now taking $\frac{E}{M} = 81{\cdot}5$ and the following values as given in *Solar Parallax and its Related Constants*, by Prof. W. Harkness, page 140, *viz.*, $\frac{S}{E+M} = 327214$, $c = 238855$ miles and $c_1 = 92796950$ miles, it follows that $\frac{\tau_1}{\tau} = {\cdot}46035 = \frac{1}{2{\cdot}17226}$.

The ϖ_1 used in this section should be distinguished from that used in the preceding sections, where it represents the longitude of the lunar perigee measured from the intersection. Its use in the latter sense is discarded after page 43.

8.

Schedules.

For convenience of reference, the tides are now arranged in tabular form, as explained in the preceding page.

Schedule of Notation.

Initial	Speed	Name of Tide
M_1 M_2 M_3 &c.	$\gamma - \sigma - \varpi$, and $\gamma - \sigma + \varpi$ $2(\gamma - \sigma)$ $3(\gamma - \sigma)$ &c.	Principal lunar series
K_2	2γ	Luni-solar semi-diurnal
N	$2\gamma - 3\sigma + \varpi$	Larger lunar elliptic
L	$2\gamma - \sigma - \varpi$ and $2\gamma - \sigma + \varpi$	Smaller lunar elliptic
2N	$2\gamma - 4\sigma + 2\varpi$	Lunar elliptic, second order
ν	$2\gamma - 3\sigma - \varpi + 2\eta$	Larger lunar evectional
λ	$2\gamma - \sigma + \varpi - 2\eta$	Smaller lunar evectional
O	$\gamma - 2\sigma$	Lunar diurnal
OO	$\gamma + 2\sigma$	
K_1	γ	Luni-solar diurnal
Q	$\gamma - 3\sigma + \varpi$	Larger lunar elliptic diurnal
	$\gamma - \sigma - \varpi$ included in M_1	Smaller lunar elliptic diurnal
J	$\gamma + \sigma - \varpi$	
	$\gamma - 4\sigma + 2\varpi$	Lunar elliptic diurnal, second order
	$\gamma - 3\sigma - \varpi + 2\eta$	Larger lunar evectional diurnal

Initial	Speed	Name of Tide
S_1 S_2 S_3 &c.	$\gamma - \eta$ $2(\gamma - \eta)$ $3(\gamma - \eta)$ &c.	Principal solar series
T	$2\gamma - 3\eta$	Larger solar elliptic
R	$2\gamma - \eta$	Smaller solar elliptic
P	$\gamma - 2\eta$	Solar diurnal
	$\frac{dN}{dt}$	19-yearly
Mm	$\sigma - \varpi$	Lunar monthly
	$\sigma - 2\eta + \varpi$	Lunar evectional monthly
Mf	2σ	Lunar fortnightly
	$3\sigma - \varpi$	Lunar termensual
Sa	η	Solar annual
Ssa	2η	Solar semi-annual
MSf	$2(\sigma - \eta)$	Luni-solar synodic fortnightly
MS	$4\gamma - 2\sigma - 2\eta$	Compound tides
μ or 2MS	$2\gamma - 4\sigma + 2\eta$	Compound tides
2SM	$2\gamma + 2\sigma - 4\eta$	Compound tides
M_2K_1	$3\gamma - 2\sigma$	Compound tides
$2M_2K_1$	$3\gamma - 4\sigma$	Compound tides
M_2N	$4\gamma - 5\sigma + \varpi$	Compound tides

Schedule of Lunar Tides.

$$\text{General Coefficient} = \tfrac{3}{2}\frac{M}{E}\left(\frac{a}{c}\right)^3 a.$$

[B, i.] *Semi-diurnal Tides; General Coefficient = $\cos^2\lambda$.*

Initial	Coefficient	Mean Value of Coefficient	Argument $2t + 2(h - \nu)$	Speed	Speed in degrees per m. s. hour
M_2	$\frac{1}{2}(1 - \frac{5}{2}e^2)\cos^4\frac{1}{2}I$	·45426	$-2(s-\xi)$	$2(\gamma-\sigma)$	28·9841042
K_2	$\frac{1}{2}(1 + \frac{3}{2}e^2)\frac{1}{2}\sin^2 I$	·03929	—	2γ	30·0821372
N	$\frac{1}{2}.\frac{7}{2}e\cos^4\frac{1}{2}I$	·08796	$-2(s-\xi)-(s-p)$	$2\gamma-3\sigma+\varpi$	28·4397296
L	$\frac{1}{2}.\frac{1}{2}e\cos^4\frac{1}{2}I$ $\times\sqrt{\{1-12\tan^2\frac{1}{2}I\cos 2(p-\xi)\}}$	·01257	$-2(s-\xi)+(s-p)-R+\pi$ where $\tan R = \dfrac{6\sin 2(p-\xi)}{\cot^2\frac{1}{2}I-6\cos 2(p-\xi)}$	$2\gamma-\sigma-\varpi$	29·5284788
2N	$\frac{1}{2}.\frac{17}{2}e^2\cos^4\frac{1}{2}I$	·01173	$-2(s-\xi)-2(s-p)$	$2\gamma-4\sigma+2\varpi$	27·8953548
ν	$\frac{1}{2}.\frac{105}{16}me\cos^4\frac{1}{2}I$	·01234† ·01706	$-2(s-\xi)+(s-p)+2h-2s$	$2\gamma-3\sigma-\varpi+2\eta$	28·5125830
λ	$\frac{1}{2}.\frac{15}{16}me\cos^4\frac{1}{2}I$	·00176† ·00330	$-2(s-\xi)-(s-p)-2h+2s+\pi$	$2\gamma-\sigma+\varpi-2\eta$	29·4556254
*μ	$\frac{1}{2}.\frac{23}{8}m^2\cos^4\frac{1}{2}I$	·00736† ·01094	$-2(s-\xi)+2h-2s$	$2\gamma-4\sigma+2\eta$	27·9682084

* Indicated by 2MS as a compound tide. † The lower of the two numbers gives the value when the coefficients of the Evection and Variation have their full values as derived from the Lunar Theory.

[B, ii.] *Diurnal Tides; General Coefficient = $\sin 2\lambda$.*

Initial	Coefficient	Mean Value of Coefficient	Argument $t + (h - \nu)$	Speed	Speed in degrees per m. s. hour
O	$(1-\frac{5}{2}e^2)\frac{1}{2}\sin I\cos^2\frac{1}{2}I$	·18856	$-2(s-\xi)+\frac{1}{2}\pi$	$\gamma-2\sigma$	13·9430356
OO	$(1-\frac{5}{2}e^2)\frac{1}{2}\sin I\sin^2\frac{1}{2}I$	·00812	$+2(s-\xi)-\frac{1}{2}\pi$	$\gamma+2\sigma$	16·1391016
K_1	$(1+\frac{3}{2}e^2)\frac{1}{2}\sin I\cos I$	·18115	$-\frac{1}{2}\pi$	γ	15·0410686
Q	$\frac{7}{2}e\,\frac{1}{2}\sin I\cos^2\frac{1}{2}I$	·03651	$-2(s-\xi)-(s-p)+\frac{1}{2}\pi$	$\gamma-3\sigma+\varpi$	13·3986609
M_1	$e\,\frac{1}{2}\sin I\cos^2\frac{1}{2}I$ $\times\sqrt{\{\frac{5}{2}+\frac{3}{2}\cos 2(p-\xi)\}}$	·00522* ·01649	$-(s-\xi)+Q-\frac{1}{2}\pi$ where $\tan Q=\frac{1}{2}\tan(p-\xi)$	$\gamma-\sigma$	14·4920521
J	$\frac{3}{2}e\,\frac{1}{2}\sin I\cos I$	·01485	$+(s-p)-\frac{1}{2}\pi$	$\gamma+\sigma-\varpi$	15·5854433
	$\frac{17}{2}e^2\,\frac{1}{2}\sin I\cos^2\frac{1}{2}I$	·00487	$-2(s-\xi)-2(s-p)+\frac{1}{2}\pi$	$\gamma-4\sigma+2\varpi$	12·8542862
	$\frac{105}{16}me\,\frac{1}{2}\sin I\cos^2\frac{1}{2}I$	·00512† ·00708	$-2(s-\xi)+(s-p)+2h-2s+\frac{1}{2}\pi$	$\gamma-3\sigma-\varpi+2\eta$	13·4715144

* The first of these two numbers is the mean value of the coefficient of the tide $\gamma-\sigma-\varpi$; the second applies to the tide M_1 compounded from $\gamma-\sigma-\varpi$ and $\gamma-\sigma+\varpi$.

† The lower of these two figures gives the value when the coefficients in the Evection have the full value as derived from the Lunar Theory.

[B, iii.] *Long Period Tides; General Coefficient* $= \frac{1}{2} - \frac{3}{2} \sin^2 \lambda$.

Name or Initial	Coefficient	Mean Value of Coefficient	*Argument*	Speed	Speed in degrees per m. s. hour
	$(1+\frac{3}{2}e^2)\,\frac{1}{3}\,(1-\frac{3}{2}\sin^2 I)$	·25224†	Of variable part is N, the long. of node	$\frac{dN}{dt}$	19·34 per annum
Mm	$3e\,\frac{1}{3}\,(1-\frac{3}{2}\sin^2 I)$	·04136	$s-p$	$\sigma-\varpi$	0·5443747
Evectional monthly	$\frac{45}{8}me\,\frac{1}{3}\,(1-\frac{3}{2}\sin^2 I)$	·00580‡ ·00755	$-(s-p)+2s-2h$	$\sigma-2\eta+\varpi$	0·4715211
*	$3m^2\,\frac{1}{3}\,(1-\frac{3}{2}\sin^2 I)$	·00422‡ ·00621	$2(s-h)$	$2(\sigma-\eta)$	1·0158958
Mf	$(1-\frac{5}{2}e^2)\,\frac{1}{2}\sin^2 I$	·07827	$2(s-\xi)$	2σ	1·0980330
Termensual	$\frac{7}{2}e\,\frac{1}{2}\sin^2 I$	·01516	$(s-p)+2(s-\xi)$	$3\sigma-\varpi$	1·6424077

* Indicated by MSf as a compound tide. † The mean value of this coefficient is $\frac{1}{3}(1+\frac{3}{2}e^2)(1-\frac{3}{2}\sin^2 i)(1-\frac{3}{2}\sin^2\omega) = \cdot 25$, and the variable part is approximately $-(1+\frac{3}{2}e^2)\sin i\cos i\sin\omega\cos\omega\cos N = -\cdot 0328\cos N$.

‡ The lower of these figures gives the value when the coefficients in the Evection and Variation have their full values as derived from the Lunar Theory.

Schedule of Solar Tides.

$$\text{General Coefficient} = \frac{3}{2}\frac{M}{E}\left(\frac{a}{c}\right)^3 a.$$

Initial	Coefficient	Value of Coefficient	Argument	Speed	Speed in degrees per m. s. hour
	[C, i.] *Semi-diurnal Tides; General Coefficient* $= \cos^2\lambda$.				
S_2	$\frac{\tau_1}{\tau}(1-\frac{5}{2}e_1^2)\,\frac{1}{2}\cos^4\frac{1}{2}\omega$	·21137	$2t$	$2(\gamma-\eta)$	30·0000000
K_2	$\frac{\tau_1}{\tau}(1+\frac{3}{2}e_1^2)\,\frac{1}{4}\sin^2\omega$	·01823	$2t+2h$	2γ	30·0821372
T	$\frac{\tau_1}{\tau}\,\frac{1}{2}.\,\frac{7}{2}e_1\cos^4\frac{1}{2}\omega$	·01243	$2t-(h-p_1)$	$2\gamma-3\eta$	29·9589314
R	$\frac{\tau_1}{\tau}\,\frac{1}{2}.\,\frac{1}{2}e_1\cos^4\frac{1}{2}\omega$	·00178	$2t+h-p_1+\pi$	$2\gamma-\eta$	30·0410686
	[C, ii.] *Diurnal Tides; General Coefficient* $= \sin 2\lambda$.				
S_1*	$\frac{\tau_1}{\tau}e_1\,\frac{1}{2}\sin\omega\cos^2\frac{1}{2}\omega \times\sqrt{\frac{5}{2}+\frac{3}{2}\cos 2p_1}$	·00155	$t+Q_1-\frac{1}{2}\pi$ where $\tan Q_1=\frac{1}{2}\tan p_1$	$\gamma-\eta$	15·0000000
P	$\frac{\tau_1}{\tau}(1-\frac{5}{2}e_1^2)\,\frac{1}{2}\sin\omega\cos^2\frac{1}{2}\omega$	·08775	$t-h+\frac{1}{2}\pi$	$\gamma-2\eta$	14·9589314
K_1	$\frac{\tau_1}{\tau}(1+\frac{3}{2}e_1^2)\,\frac{1}{2}\sin\omega\cos\omega$	·08407	$t+h-\frac{1}{2}\pi$	γ	15·0410686
	[C, iii.] *Long Period Tides; General Coefficient* $= \frac{1}{2}-\frac{3}{2}\sin^2\lambda$.				
Sa*	$\frac{\tau_1}{\tau}3e_1\,\frac{1}{3}(1-\frac{3}{2}\sin^2\omega)$	·00589	$h-p_1$	η	0·0410686
Ssa	$\frac{\tau_1}{\tau}(1-\frac{5}{2}e_1^2)\,\frac{1}{2}\sin^2\omega$	·03643	$2h$	2η	0·0821372

* Included in the meteorological tides of *rigorous* speeds $\gamma-\eta$ and η, see Sec. 10.

Schedule of Speeds and of Coefficients in terms of M_2, K_1 *or* Mf.

Tide	Speed in degrees per m. s. hour	Coefficient in terms of M_2	Tide	Speed in degrees per m. s. hour	Coefficient in terms of K_1	Tide	Speed in degrees per m. s. hour	Coefficient in terms of Mf
M_2	28·9841042	1·00000	K_1	15·0410686	1·00000	Mf	1·0980330	1·00000
S_2	30·0000000	0·46531	O	13·9430356	0·71096	Mm	0·5443747	0·52843
N	28·4397296	·19363	P	14·9589314	·33086	Ssa	0·0821372	·46544
K_2	30·0821372	·12662	Q	13·3986609	·13766	$3\sigma - \varpi$	1·6424077	·19369
ν	28·5125830	·03756	M_1	14·4920521	·06217	Evectional monthly	0·4715211	·09646
L	29·5284788	·02767	J	15·5854433	·05599	$2(\sigma - \eta)$	1·0158958	·07934
T	29·9589314	·02736	OO	16·1391016	·03062	Sa	0·0410686	·07525
2N	27·8953548	·02582	$\gamma - 3\sigma - \varpi + 2\eta$	13·4715144	·02669			
μ	27·9682084	·02408	$\gamma - 4\sigma + 2\varpi$	12·8542862	·01836			
λ	29·4556254	·00726	S_1	15·0000000	·00584			
R	30·0410686	·00392						

A tide of greater importance than some of those retained here is that referred to where the approximation with regard to I was introduced, *viz.*, with speed $2\gamma + \sigma - \varpi$; the value of its coefficient is ·00323. There is also the larger variational diurnal tide which has been omitted: it would have a coefficient ·00450; also an evectional termensual tide, $\frac{105}{16}\, me\, \frac{1}{2} \sin^2 I \cos(3s-2h+p)$ with coefficient of magnitude ·00292. All other tides in a complete development as far as the second order of small quantities, without any approximation to the obliquity of the lunar orbit, would have smaller coefficients than those comprised in the above list. Such a development was made by the late Professor J. C. Adams, and the values of all the coefficients computed therefrom, in comparison with the above.

9.

Tides depending on the Fourth Power of the Moon's Parallax.

The second term in the expression for the moon's tide-generating potential given in equation (2) *viz.*:—

$$V = \frac{\mu M}{r^4} \rho^3 \left(\tfrac{5}{2} \cos^3 z - \tfrac{3}{2} \cos z\right)$$

will give the tides depending on the fourth power of the moon's parallax.

In expanding this term, the eccentricity of the lunar orbit may be omitted; and it will appear below, when the principal terms are evaluated, that the declinational tides may be safely omitted. Thus, for this approximation, $r = c$, $M_3 = 0$, and all terms in M_1 and M_2 which involve q^2 may be omitted. Just as the first term in the potential was expanded in spherical harmonics of the second order, if the term under consideration is expanded in spherical harmonics of the third order it becomes

$$V \div \frac{\mu M}{c^4} \rho^3 = \tfrac{5}{8}(\xi^3 - 3\xi\eta^2)(M_1^3 - 3M_1 M_2^2) + \tfrac{5}{8}(\eta^3 - 3\xi^2\eta)(M_2^3 - 3M_1^2 M_2)$$
$$+ \tfrac{3}{8}(\xi^3 + \xi\eta^2 - 4\xi\zeta^2)(M_1^3 + M_1 M_2^2) + \tfrac{3}{8}(\xi^2\eta + \eta^3 - 4\eta\zeta^2)(M_1^2 M_2 + M_2^3).$$

Corresponding to these four terms there will be four tides of the types determined by these functions.

Now neglecting q^2,

$$M_1 = p^2 \cos(\chi - l) \quad \text{and} \quad M_2 = -p^2 \sin(\chi - l),$$

so that

$$M_1^3 - 3M_1 M_2^2 = p^6 \cos 3(\chi - l) \quad \text{and} \quad M_1^3 + M_1 M_2^2 = p^6 \cos(\chi - l).$$

Also

$$\eta = 0 \quad \text{and} \quad \xi = \cos\lambda;$$

so that

$$\xi^3 - 3\xi\eta^2 = \cos^3\lambda \quad \text{and} \quad \xi^3 + \xi\eta^2 - 4\xi\zeta^2 = \cos\lambda\,(1 - 5\sin^2\lambda),$$

and following the same procedure as before, the height of the tide from the second term in the potential becomes

$$h = \tfrac{3}{2}\frac{M}{E}\left(\frac{a}{c}\right)^3 \frac{a^2}{c}\left[\tfrac{5}{12}\cos^3\lambda\, p^6 \cos 3(\chi - l) + \tfrac{1}{4}\cos\lambda\,(1 - 5\sin^2\lambda)\, p^6 \cos(\chi - l)\right] \quad . \quad . \quad (37)$$

Now, $\cos\lambda\,(5\sin^2\lambda - 1)$ has its maximum value $\dfrac{16}{3\sqrt{15}}$ when $\cos\lambda = \tfrac{2}{15}\sqrt{15}$, that is when $\lambda = 58°\ 54'$; thus (37) may be written

$$h = \tfrac{3}{2}\frac{M}{E}\left(\frac{a}{c}\right)^3 a\Big[\cos^3\lambda\ \tfrac{5}{12}\left(\frac{a}{c}\right)\cos^6\tfrac{1}{2}I \cos\left[3t + 3(h - \nu) - 3(s - \xi)\right]$$

$$+ \tfrac{3}{16}\sqrt{15}\cos\lambda\,(1 - 5\sin^2\lambda)\,\tfrac{4}{45}\sqrt{15}\left(\frac{a}{c}\right)\cos^6\tfrac{1}{2}I\cos\left[t + (h - \nu) - (s - \xi)\right]\Big] \quad . \quad . \quad (38)$$

In this expression there is the same general coefficient as before, and the spherical harmonics $\cos^3\lambda$, $\tfrac{3}{16}\sqrt{15}\cos\lambda\,(5\sin^2\lambda - 1)$ have the maximum value unity, the first at the equator and the second in latitude 58° 54′. The speeds of the two tides are respectively $3(\gamma - \sigma)$ or 43°·4761563 per mean solar hour, and $(\gamma - \sigma)$ or 14°·4920521 per mean solar hour.

The coefficient of the tide $3(\gamma - \sigma)$ is $\tfrac{5}{12}\left(\dfrac{a}{c}\right)\cos^6\tfrac{1}{2}I$, and the mean value of this function multiplied by $\cos 3(\nu - \xi)$ is ·00599.

The coefficient of the tide $(\gamma - \sigma)$ is $\tfrac{4}{45}\sqrt{15}\left(\dfrac{a}{c}\right)\cos^6\tfrac{1}{2}I$, and the mean value of this function multiplied by $\cos(\nu - \xi)$ is ·00495.

The expression for the tides is written in a form applicable to the equatorial belt bounded by latitudes 26° 34′ N. and S., *viz.*, where $\sin\lambda = \tfrac{1}{5}\sqrt{5}$. Outside of this belt what may be called high tide will correspond with low water, but the distribution of the land will probably seriously disturb the latitude of evanescent tide.

Comparing the mean values of these two tides with what has gone before it would appear that the terdiurnal tide $3(\gamma - \sigma)$ or M_3 is smaller than some of the tides that are neglected, but it is found with scarcely any trouble from the numerical analysis of the tidal observations, and is therefore still evaluated. The M_1 tide of *rigorous* speed $(\gamma - \sigma)$ is about the same size as the tide of speed $\gamma - \sigma - \varpi$; the former might be compounded with the latter and with the tide of speed $\gamma - \sigma + \varpi$ but the result, involving the latitude both in the coefficient and in the argument would be cumbersome and the composition has not hitherto been carried out.

10.

Meteorological Tides.

A rise and fall of water due to regular day and night breezes, prevalent winds, rainfall and evaporation, is called a meteorological tide.

All tides whose period is an exact multiple or sub-multiple of a mean solar day, or of a tropical year are affected by meteorological conditions. Thus all the tides of the principal solar astronomical series with speeds $\gamma - \eta$, $2(\gamma - \eta)$, $3(\gamma - \eta)$, &c., are subject to more or less meteorological perturbation, and although the diurnal elliptic tide S_1 or $\gamma - \eta$, the semi-annual and annual tides of speeds 2η and η, are all probably quite insensible as arising from astronomical causes, yet they have been found of sufficient importance to be included on the tide-predicter.

The annual and semi-annual tides are of enormous importance in some rivers, and in such cases the ter-annual tide 3η is probably also important, but no harmonic analysis has yet been made for it.

In the reduction of these tides, the arguments of the S series are t, $2t$, $3t$, &c.; and of the annual, semi-annual and ter-annual tides h, $2h$, $3h$. As far as can be foreseen, the magnitudes of these tides will be constant from year to year.

11.

Over-tides.

When a wave runs into shallow water, its form undergoes a progressive change as it advances, the front slope generally becoming steeper and the back slope less steep. The most striking example of such a change is when the tide runs up a river in the form of a 'bore.'

A wave which in deep water presented an approximately simple harmonic contour, departs largely from that form when it has run into shallow water. Thus in rivers, the rise and fall of the water is not even approximately a simple harmonic motion. From the nature of harmonic analysis it is, however, possible to represent the motion by simple harmonic oscillations. For this purpose, it is necessary to introduce a series of over-tides whose speeds are double, treble, quadruple the speed of the fundamental astronomical tide.

The only tides, in which it has hitherto been thought necessary to represent this change of form in shallow water, belong to the principal lunar and principal solar series. Thus, besides the fundamental astronomical tides M_2 and S_2, the over-tides M_4, M_6, M_8 and S_4, S_6 have been deduced by harmonic analysis.

The height of the fundamental tide M_2 varies from year to year, according to the variation in the obliquity of the lunar orbit, and this variability is represented by the coefficient $\cos^4 \frac{1}{2}I$. It is probable that the variability of M_4, M_6, M_8, will be represented by the square, cube and fourth power of that coefficient.

The law connecting the phase of an over-tide with the height of the fundamental tide is unknown, and under these circumstances it is only possible to make the argument of the over-tide a multiple of the argument of the fundamental tide, with a constant subtracted. If that constant is found to be the same from year to year, then it will be known that the phase of an over-tide is independent of the height of the fundamental tide.

Schedule of Over-tides.

Tide	Coefficient	Argument	Speed	Speed in degrees per m. s. hour
M_4	$(\cos^4 \frac{1}{2}I)^2$	$4t + 4(h - \nu) - 4(s - \xi)$	$4\gamma - 4\sigma$	57·9682084
M_6	$(\cos^4 \frac{1}{2}I)^3$	$6t + 6(h - \nu) - 6(s - \xi)$	$6\gamma - 6\sigma$	86·9523126
M_8	$(\cos^4 \frac{1}{2}I)^4$	$8t + 8(h - \nu) - 8(s - \xi)$	$8\gamma - 8\sigma$	115·9364168
S_4	1	$4t$	$4\gamma - 4\eta$	60·0000000
S_6	1	$6t$	$6\gamma - 6\eta$	90·0000000

The column of arguments, in the above schedule, only gives that part of the argument which is derived from theory, and the constant to be subtracted from the argument is derivable from observation.

It is necessary to have recourse also to observation to determine whether the suggested law of variability in the magnitude of the M over-tides holds good.

12.

Compound Tides.

When two waves of different speeds are propagated in the same water, the vertical displacement at the surface is generally determined with sufficient accuracy by summing the displacements due to each wave separately. If, however, the height of each wave is not a small fraction of the depth of the water, the principle of superposition leads to inaccuracy, and it becomes necessary to take into account the squares and products of the displacements.

The consideration of the products of the displacements due to each tide gives what is known as compound tides, and these are found to be of considerable importance in estuaries. As each of these products contains two cosines multiplied together, which may further be exhibited as the sum of two cosines, each product will give rise to two compound tides whose arguments are respectively the sum and the difference of the arguments of the interacting waves.

Probably the best way of searching at any station for the compound tides which are likely to be important, is to take the semi-ranges of the five or six largest tides at that station, and to form index numbers of importance by multiplying the semi-ranges together two and two. Having selected as many of these combinations, in the order of importance, as may be thought expedient, the arguments of the compound tides are to be found by adding and subtracting the arguments of the components taken in pairs.

In the general case, it is only possible to take the tides which the previous schedules have shown usually to be large, and to form a list from these. The tides selected here are M_2, K_1, S_2, O and N, to which are added M_4 and S_4, although it is not possible to affix index numbers to combinations involving them.

Schedule of Speeds arising out of Combinations.

	K_1	S_2	O	N	M_4	S_4
M_2	$3\gamma - 2\sigma$ $\gamma - 2\sigma$ (O)	$4\gamma - 2\sigma - 2\eta$ $2\sigma - 2\eta$	$3\gamma - 4\sigma$ γ (K_1)	$4\gamma - 5\sigma + \varpi$ $\sigma - \varpi$ (Mm)	—	$6\gamma - 2\sigma - 4\eta$ $2\gamma + 2\sigma - 4\eta$
K_1	—	$3\gamma - 2\eta$ $\gamma - 2\eta$ (P)	$2\gamma - 2\sigma$ (M_2) 2σ (Mf)	$3\gamma - 3\sigma + \varpi$ $\gamma - 3\sigma + \varpi$ (Q)	$5\gamma - 4\sigma$ $3\gamma - 4\sigma$ (bis)	$5\gamma - 4\eta$ $3\gamma - 4\eta$
S_2	—	—	$3\gamma - 2\sigma - 2\eta$ $\gamma + 2\sigma - 2\eta$	$4\gamma - 3\sigma + \varpi - 2\eta$ $3\sigma - \varpi - 2\eta$	$6\gamma - 4\sigma - 2\eta$ $2\gamma - 4\sigma + 2\eta$	—
O	—	—	—	$3\gamma - 5\sigma + \varpi$ $\gamma - \sigma + \varpi$ (M_1)	$5\gamma - 6\sigma$ $3\gamma - 2\sigma$ (bis)	$5\gamma - 2\sigma - 4\eta$ $3\gamma + 2\sigma - 4\eta$
N	—	—	—	—	$6\gamma - 7\sigma + \varpi$ $2\gamma - \sigma - \varpi$ (L)	$6\gamma - 3\sigma + \varpi - 4\eta$ $2\gamma + 3\sigma - \varpi - 4\eta$

This schedule gives the speeds of the compound tides, and in many cases it will be observed that the compound tide itself has a speed identical with that of an astronomical or meteorological tide: these cases are indicated by the addition of the initial after the speed in question. It thus appears from the schedule that the tides O, K_1, Mm, P, M_2, Mf, Q, M_1, L are liable to perturbation in shallow water.

If either of the component tides or both be of lunar origin, the height of the compound tide will change from year to year, and will probably vary proportionally to the product of the coefficients of the component tides.

As in the case of the over-tides, the law of variability of the amplitudes of compound tides in various years is only to be tested by observation.

The following schedule contains twelve of the most important compound tides, those which are at present reduced being denoted by initials.

Schedule of Compound Tides.

Index of Importance	Initial	Arguments combined	Speed	Speed in degrees per m. s. hour
1205 —	M_2K_1	$M_2 + K_1$ $M_4 - O$	$\left\{ 3\gamma - 2\sigma \right\}$	44·0251728
960	MS	$M_2 + S_2$	$4\gamma - 2\sigma - 2\eta$	58·9841042
960	MSf	$S_2 - M_2$	$2\sigma - 2\eta$	1·0158958
857 —	$2M_2K_1$	$M_2 + O$ $M_4 - K_1$	$\left\{ 3\gamma - 4\sigma \right\}$	42·9271398
561	—	$S_2 + K_1$	$3\gamma - 2\eta$	45·0410686
400	M_2N	$M_2 + N$	$4\gamma - 5\sigma + \varpi$	57·4238338
399	—	$S_2 + O$	$3\gamma - 2\sigma - 2\eta$	43·9430356
399	—	$S_2 - O$	$\gamma + 2\sigma - 2\eta$	16·0569644
—	2SM	$S_4 - M_2$	$2\gamma + 2\sigma - 4\eta$	31·0158958
—	—	$M_2 + S_4$	$6\gamma - 2\sigma - 4\eta$	88·9841042
—	μ or 2MS	$M_4 - S_2$	$2\gamma - 4\sigma + 2\eta$	27·9682084
—	—	$M_4 + S_2$	$6\gamma - 4\sigma - 2\eta$	87·9682084

It will be noticed that in two cases an over-tide of one speed arises in more than one way, and accordingly different parts of it have different arguments and coefficients. In these cases, the utilisation of the results of one year for prediction in future years can only be made by dividing up the compound tide into several parts, according to its theoretical origin. In order to do this it is necessary to know the law which connects the heights of a summation and a difference compound tide. A like difficulty arises from the fact that MSf and 2SM are also variational tides.

In practice, however, the compound tide will generally be so small, that it may probably be treated as though it arose entirely in one way, and accordingly the tides $3\gamma - 2\sigma$ or M_2K_1 and $3\gamma - 4\sigma$ or $2M_2K_1$ are treated as though they arose entirely from $M_2 + K_1$ and $M_4 - K_1$ respectively, and MSf and 2SM as though they were entirely compound tides.

13.

General Method of Reduction of Tidal Observations.

As will be seen at the end of the next chapter, the printed tabular forms, on which the numerical harmonic analysis of the tides is carried out, are arranged so that the series of observations to be analysed is supposed to begin at noon, or 0^h, of the first day, and to extend for a year from that time. It has not been found practicable to arrange that the first day shall be the same at all the ports of observation.

The tides for which the reduction by harmonic analysis has been carried out are as follows:— S_1, S_2, S_4, S_6, S_8, M_1, M_2, M_3, M_4, M_6, M_8, O, K_1, K_2, P, J, Q, L, N, λ, ν, μ, R, T, MS, 2SM, 2N, M_2N, M_2K_1, $2M_2K_1$, Mm, Mf, MSf, Sa, Ssa: of these the tides S_4, S_6, S_8, M_1, M_3, M_8, λ, R, Mm, Mf, MSf are not at present used in predicting the tides.

Supposing n to be the speed of any tide in degrees per mean solar hour, and t to be mean solar time elapsing since 0^h of the first day, then the immediate result of the harmonic analysis is to obtain A and B, two heights, estimated in feet and tenths, such that the height of this tide is given by

$$A \cos nt + B \sin nt.$$

The question then arises as to what further reductions it will be convenient to make, in order to present the results in the most convenient form.

Firstly, let
$$R = \sqrt{A^2 + B^2} \quad \text{and} \quad \tan \zeta = \frac{B}{A},$$
then the tide is represented by

$$R \cos (nt - \zeta).$$

In this form, R is the semi-range of the tide in British feet, and ζ is an angle such that $\frac{\zeta}{n}$ is the time elapsing after 0^h of the first day, until it is high-water of this particular tide. It is obvious that ζ may have any value from 0° to 360°, and that the results of the analysis of successive years of observation will not be comparable with one another, when presented in this form.

Secondly, let the results of the analysis be presented in a number of terms of the form

$$f H \cos (V + u - \kappa).$$

Here, V is a linear function of the moon's and sun's mean longitudes, the mean longitudes of the moon's and sun's perigees and the local mean solar time at the place of observation, reduced to angle at 15° per hour. V increases uniformly with the time, and its rate of increase per mean solar hour is the n of the first method, or the speed of the tide.

It is supposed that u stands for a certain function of the longitude of the node of the lunar orbit at an epoch half a year later than 0^h of the first day. Strictly speaking, it should be taken as this same function of the longitude of the moon's node, varying as the node moves; however, as the variation is but small in the course of a year, u may be treated as constant and put equal to the average value for the year, and for this, the true value of u at exactly mid-year is used. Together $V + u$ constitutes that function which has been tabulated as 'the argument' in the schedules.

Since $V + u$ is the whole argument according to the equilibrium theory of tides, with the sea covering the whole earth, it follows that $\frac{\kappa}{n}$ is the lagging of the tide which arises from kinetic action, friction of the water, imperfect elasticity of the earth, and the distribution of the land.

It is supposed that H is the mean value in British feet of the semi-range of the particular tide in question, and f is a numerical factor of augmentation or diminution, due to the variability of the obliquity of the lunar orbit. The value of f is the ratio of the quantity in the column of coefficients of the preceding schedules to its mean value, and the general method of determining it will be given in Section 18.

It is obvious, then, that, if the tidal observations are consistent from year to year, H and κ should come out the same from each year's reductions; and it is only when the results are presented in such a form as this, that it will be possible to judge whether the harmonic analysis is giving satisfactory results. This mode of giving the tidal results is also essential for the use of the tide-predicting machine.

It is clear that $\mathrm{H} = \frac{\mathrm{R}}{\mathrm{f}}$, and that, if V_0 be the value of V at 0^h of the first day,

$$-\zeta = V_0 + u - \kappa,$$

so that

$$\kappa = \zeta + V_0 + u.$$

Thus the rule for the determination of κ is:—*Add to the value of* ζ, *the value of the argument at* 0^h *of the first day.*

The above statement of procedure is applicable to nearly all the tides, but there are certain tides *viz.*, K_1 and K_2, which have their origins jointly in the tide-generating forces of the moon and sun, and also the tides L and M_1, which are rendered complex from the fact that the tidal analysis only extends over a year. These tides require the special treatment which will now be indicated.

14.

Special Treatment of the Tides K_1 *and* K_2.

The schedules B, ii. and C, ii. give the expression for the K_1 tide of luni-solar origin in the form

$$\mathrm{M}\cos(t + h - \tfrac{1}{2}\pi - \nu) + \mathrm{S}\cos(t + h - \tfrac{1}{2}\pi) \quad \ldots \ldots \quad (39)$$

where M, the lunar coefficient, is $(1 + \frac{3}{2}e^2)\frac{1}{2}\sin I \cos I$,

and S, the solar coefficient, is $\frac{\tau_1}{\tau}(1 + \frac{3}{2}e_1^2)\frac{1}{2}\sin\omega\cos\omega$,

the general coefficients being left out.

If then,

$$\left.\begin{aligned} \mathrm{R}^2 &= \mathrm{M}^2\left\{1 + \left(\frac{\mathrm{S}}{\mathrm{M}}\right)^2 + 2\frac{\mathrm{S}}{\mathrm{M}}\cos\nu\right\} \\ \text{and} \quad \tan\nu' &= \frac{\sin\nu}{\cos\nu + \frac{\mathrm{S}}{\mathrm{M}}} \end{aligned}\right\} \quad \ldots \ldots \quad (40)$$

the resultant tide may be written

$$R \cos(t + h - \tfrac{1}{2}\pi - \nu' - \kappa),$$

the transition to the actual case being effected by the introduction of κ.

If h_0 be the sun's mean longitude at 0^h of the first day, $t + h - h_0$ is equal to γt, where t is now mean solar time measured from that 0^h and not reduced to angle; so that if

$$\zeta = \kappa + \tfrac{1}{2}\pi - h_0 + \nu' \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (41)$$

the expression becomes

$$R \cos(\gamma t - \zeta),$$

which is the form in which the result of harmonic analysis for the total K_1 tide is expressed in the first method.

From (41)

$$\kappa = \zeta + (h_0 - \tfrac{1}{2}\pi) - \nu' \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (42)$$

In this formula, $h_0 - \frac{1}{2}\pi$ is V_0 for the solar K_1 tide, and ν' is a complex function of N, the longitude of the moon's node, to be computed from the second equation of (40).

It now remains to consider the coefficient f.

If M_0 is the mean value of the lunar K_1 tide, it will be shown in Section 18 that

$$\frac{M}{M_0} = \frac{\sin I \cos I}{\sin\omega\cos\omega\,(1 - \frac{3}{2}\sin^2 i)};$$

also the ratio of M to S is according to theory

$$\frac{M}{S} = \frac{\tau\,(1 + \frac{3}{2}e^2)\sin I \cos I}{\tau_1\,(1 + \frac{3}{2}e_1^2)\sin\omega\cos\omega}.$$

Now if R_0 be the mean value of R, it will be shown in Section 18 that

R_0 = the part independent of N in the expansion of $R \cos \nu'$.

But
$$\sec^2\nu' = 1 + \tan^2\nu' = \frac{1 + 2\left(\frac{S}{M}\right)\cos\nu + \left(\frac{S}{M}\right)^2}{\left(\cos\nu + \frac{S}{M}\right)^2},$$

so that
$$\cos\nu' = \frac{\cos\nu + \frac{S}{M}}{\left\{1 + 2\frac{S}{M}\cos\nu + \left(\frac{S}{M}\right)^2\right\}^{\frac{1}{2}}},$$

therefore
$$R\cos\nu' = M\cos\nu + S.$$

Now, as will be shown in Section 18, the part independent of N in the expansion of $M \cos \nu$ is M_0, and in S is S_0,

so that
$$R_0 = M_0 + S_0;$$

therefore
$$\left.\begin{aligned} f = \frac{R}{R_0} &= \frac{\left\{1 + \left(\frac{S}{M}\right)^2 + 2\frac{S}{M}\cos\nu\right\}^{\frac{1}{2}}}{1 + \frac{S_0}{M_0}}\,\frac{M}{M_0} \\ \text{where}\quad \frac{S_0}{M_0} &= \frac{\tau_1\,(1 + \frac{3}{2}e_1^2)}{\tau\,(1 + \frac{3}{2}e^2)}\,\frac{1}{(1 - \frac{3}{2}\sin^2 i)} \\ \text{and}\quad \frac{S}{M} &= \frac{S_0}{M_0}\,\frac{\sin\omega\cos\omega\,(1 - \frac{3}{2}\sin^2 i)}{\sin I\cos I} \end{aligned}\right\} \quad . \quad . \quad . \quad . \quad . \quad (43)$$

Following the same process in regard to the K_2 luni-solar tide, it will be found that it may be written

$$R \cos (2t + 2h - 2\nu'' - \kappa),$$

where
$$R = M \left\{1 + \left(\frac{S}{M}\right)^2 + 2\,\frac{S}{M} \cos 2\nu\right\}^{\frac{1}{2}},$$

and
$$\tan 2\nu'' = \frac{\sin 2\nu}{\cos 2\nu + \dfrac{S}{M}};$$

and it follows that
$$\left.\begin{aligned} f &= \frac{\left\{1 + \left(\dfrac{S}{M}\right)^2 + 2\,\dfrac{S}{M} \cos 2\nu\right\}^{\frac{1}{2}}}{1 + \dfrac{S_0}{M_0}}\,\frac{M}{M_0} \\ \text{where}\quad \frac{S_0}{M_0} &= \frac{\tau_1\,(1 + \frac{3}{2}e_1^2)}{\tau\,(1 + \frac{3}{2}e^2)}\,\frac{1}{(1 - \frac{3}{2}\sin^2 i)} \\ \text{and}\quad \frac{S}{M} &= \frac{S_0}{M_0}\,\frac{\sin^2 \omega\,(1 - \frac{3}{2}\sin^2 i)}{\sin^2 I} \end{aligned}\right\} \quad \ldots\ldots \quad (44)$$

The numerical value of $\frac{S_0}{M_0}$ both for K_1 and K_2 is ·46407.

15.

Special Treatment of the Tide L.

It does not seem to be possible to bring the rule for the reduction of the L tide into an absolutely rigorous form, and the method must be looked on as a semi-empirical one, invented to take some account of perturbation.

It appears from the schedule B, i. that this tide is proportional to

$$\cos^4 \tfrac{1}{2}I \sqrt{1 - 12 \tan^2 \tfrac{1}{2}I \cos 2\,(p - \xi)}\,\cos\left[2\,t + 2\,(h - \nu) - 2\,(s - \xi) + (s - p) - R + \pi - \kappa\right] \quad . \quad (45)$$

where
$$\tan R = \frac{\sin 2\,(p - \xi)}{\frac{1}{6}\cot^2 \frac{1}{2}I - \cos 2\,(p - \xi)}.$$

The tide is now only approximately harmonic and the amplitude is variable. If the part under the root were unity and $R = 0$, the expression would represent the pure L tide: hence, if in analysing over the period of a year, a mean value is assigned to R as a constant, and a mean value to the part under the root also as a constant, some account will have been taken of the perturbing term. Consequently, R must be considered as forming part of the function u for which the mean value is to be taken; and although this way of looking at it is not very satisfactory, seeing that p increases by nearly 41° per annum, yet it is practically sufficient for a small tide like L.

If then, P is taken as the longitude of the perigee at mid-year measured from the intersection, and R is computed from the formula

$$\tan R = \frac{\sin 2P}{\frac{1}{6}\cot^2 \frac{1}{2}I - \cos 2P} \quad \ldots\ldots\ldots \quad (46)$$

the treatment will be the same as in all the other cases, if the argument $V + u$ is taken as

$$2\,t + 2\,(h - \nu) - 2\,(s - \xi) + (s - p) - R + \pi.$$

The factor f will be found, by considering the part under the root as unity, to be,

$$\frac{\cos^4 \frac{1}{2} I}{\cos^4 \frac{1}{2}\omega \cos^4 \frac{1}{2} i} \sqrt{1 - 12 \tan^2 \frac{1}{2} I \cos 2P}.$$

16.

Special Treatment of the Tide M_1.

The procedure in regard to this tide must also be looked on as semi-empirical; and here it is of even less importance to be correct, as the true lunar diurnal tide depending on the fourth power of the moon's parallax has been neglected.

Reference to schedule B, ii. shows that this tide is proportional to

$$\sin I \cos^2 \tfrac{1}{2} I \sqrt{\tfrac{5}{2} + \tfrac{3}{2} \cos 2(p - \xi)} \cos \left[t + (h - \nu) - (s - \xi) + Q - \tfrac{1}{2}\pi - \kappa\right] \quad . \quad . \quad (47)$$

where $\tan Q = \frac{1}{2} \tan (p - \xi)$.

As before, Q must be considered part of the function u for which a mean value is to be taken, the remark made about R applying equally to it.

Thus Q must be computed from the formula

$$\tan Q = \tfrac{1}{2} \tan P \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (48)$$

the argument $V + u$ being

$$t + (h - \nu) - (s - \xi) + Q - \tfrac{1}{2}\pi,$$

and the factor f being

$$\frac{\sin I \cos^2 \frac{1}{2} I}{\sin \omega \cos^2 \frac{1}{2}\omega \cos^4 \frac{1}{2} i} \sqrt{1 + \tfrac{3}{5} \cos 2P} \quad . \quad . \quad . \quad . \quad . \quad . \quad (49)$$

Through an oversight in the original computations, the quantity $\sqrt{\frac{5}{2}}$ was left out, and the factor introduced into the computation forms as $\frac{\sin I \cos^2 \frac{1}{2} I}{\sin \omega \cos^2 \frac{1}{2}\omega \cos^4 \frac{1}{2} i} \sqrt{\frac{5}{2} + \frac{3}{2} \cos 2P}$. As it is a matter of indifference for the practical prediction of the tides what factor is used, this value has been allowed to stay both in the forms and in the remaining chapters of this volume.

17.

Method of computing the Arguments and Coefficients.

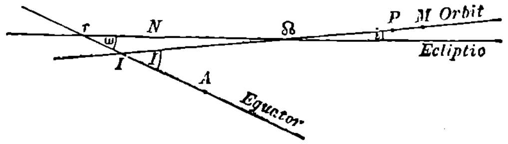
In performing the reductions of the preceding pages, a number of numerical quantities are required which are to be derived from the positions of the heavenly bodies.

In the accompanying figure,

$I ☊ = N - \xi$,

$♈ I = \nu$,

$♈ ☊ = N$,



and the angles at ♈, ☊ and I are now ω, i and I respectively.

The usual formulæ in spherical trigonometry consequently give

$$\left.\begin{aligned} \cot(N-\xi)\sin N &= \cos N\cos i + \sin i\cot\omega \\ \cot\nu\sin N &= \cos N\cos\omega + \sin\omega\cot i \\ \cos I &= \cos i\cos\omega - \sin i\sin\omega\cos N \end{aligned}\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad (50)$$

so that if β is an auxiliary defined by $\tan\beta = \tan i\cos N$ . . . . . (51)

then

$$\left.\begin{aligned} \cos I &= \cos i\sec\beta\cos(\omega+\beta) \\ \sin\nu &= \sin i\ \mathrm{cosec}\, I\sin N \\ \sin(N-\xi) &= \sin\omega\ \mathrm{cosec}\, I\sin N \end{aligned}\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad (52)$$

a table of values of ξ, ν, I for every half degree of N with $\omega = 23° 27'{\cdot}3$ and $i = 5° 8'{\cdot}8$, is given at the end of the next chapter.

18.

On the Mean Values of the Coefficients in Schedules [B].

In the three schedules B, i., B, ii., B, iii. of the lunar tides, the coefficients are certain functions of I, and there are certain terms in the arguments, which are functions of ν and ξ. All these terms may be typified by $J\cos(T+u)$, where J is a function of I, and u of ν and ξ. If the values of J and u are substituted in terms of ω, i and N and the result developed, a series of terms is obtained in which one is independent of N. Now, it is shown in what follows that the part independent of N in $J\sin u$ is zero, and in $J\cos u$ is J_1, say; therefore the part independent of N in the expression $J\cos(T+u)$ is $J_1\cos T$, so that J_1 is the mean value of the semi-range of the tide in question.

A reference to the schedules shows that the following values of $J\cos u$ are required:—

$$\cos^4\tfrac{1}{2}I\cos 2(\nu-\xi); \quad \sin^2 I\cos 2\nu; \quad \sin I\cos^2\tfrac{1}{2}I\cos(2\xi-\nu); \quad \sin I\sin^2\tfrac{1}{2}I\cos(2\xi+\nu);$$

$$\sin I\cos I\cos\nu; \quad \sin^2 I\cos 2\xi; \quad 1-\tfrac{3}{2}\sin^2 I,$$

with corresponding values for $J\sin u$.

Now let $P = \cos\tfrac{1}{2}\omega$, $p = \cos\tfrac{1}{2}i$, $Q = \sin\tfrac{1}{2}\omega$ and $q = \sin\tfrac{1}{2}i$,

and let

$$\pi = Pp - Qqe^{N\sqrt{-1}}, \quad \kappa = Qp + Pqe^{N\sqrt{-1}},$$

$$\pi_1 = Pp - Qqe^{-N\sqrt{-1}}, \quad \kappa_1 = Qp + Pqe^{-N\sqrt{-1}}.$$

Then

$$\begin{aligned} \sin I\cos(N-\xi) &= \sin i\cos\omega + \cos i\sin\omega\cos N \\ &= 2[(P^2-Q^2)pq + PQ(p^2-q^2)\cos N], \end{aligned}$$

and

$$\sin I\sin(N-\xi) = 2PQ\sin N.$$

Therefore

$$\begin{aligned} \sin Ie^{(N-\xi)\sqrt{-1}} &= \sin I\{\cos(N-\xi) + \sqrt{-1}\sin(N-\xi)\} \\ &= 2[(P^2-Q^2)pq + PQ(p^2-q^2)\cos N + PQ(p^2+q^2)\sqrt{-1}\sin N] \\ &= 2[(P^2-Q^2)pq + PQp^2e^{N\sqrt{-1}} - PQq^2e^{-N\sqrt{-1}}] \\ &= 2[Pq(Pp-Qqe^{-N\sqrt{-1}}) + Qp(Ppe^{N\sqrt{-1}} - Qq)] \\ &= 2\pi_1[Pq + Qpe^{N\sqrt{-1}}] \\ &= 2\pi_1\kappa_1 e^{N\sqrt{-1}} \end{aligned}$$

so that

$$\sin Ie^{-\xi\sqrt{-1}} = 2\pi_1\kappa_1;$$

again $\sin I \cos \nu = \sin \omega \cos i + \cos \omega \sin i \cos N$

$$= 2[PQ(p^2 - q^2) + pq(P^2 - Q^2)\cos N],$$

and $\sin I \sin \nu = 2pq \sin N;$

so that similarly $\sin I e^{\nu\sqrt{-1}} = 2\pi_1 \kappa.$

Also $\cos I = \cos \omega \cos i - \sin \omega \sin i \cos N$

$$= (P^2 - Q^2)(p^2 - q^2) - 4PQpq \cos N$$

$$= P^2p^2 - P^2q^2 - Q^2p^2 + Q^2q^2 - 2PQpq(e^{N\sqrt{-1}} + e^{-N\sqrt{-1}})$$

$$= \pi\pi_1 - \kappa\kappa_1;$$

and $\pi\pi_1 + \kappa\kappa_1 = P^2p^2 + Q^2q^2 + Q^2p^2 + P^2q^2$

$$= (P^2 + Q^2)(p^2 + q^2)$$

$$= 1;$$

therefore $2\cos^2 \tfrac{1}{2} I = 1 + \cos I = 2\pi\pi_1$

or $\cos^2 \tfrac{1}{2} I = \pi\pi_1$ and $\sin^2 \tfrac{1}{2} I = \kappa\kappa_1.$

Now $\sin^2 I e^{(\nu-\xi)\sqrt{-1}} = 4\pi_1^2 \kappa\kappa_1,$

so that $e^{(\nu-\xi)\sqrt{-1}} = \dfrac{\pi_1}{\pi};$

therefore $$\cos 2(\nu - \xi) = \frac{e^{2(\nu-\xi)\sqrt{-1}} + e^{-2(\nu-\xi)\sqrt{-1}}}{2} = \frac{\pi^4 + \pi_1^4}{2\pi^2\pi_1^2},$$

or $$\cos^4 \tfrac{1}{2} I \cos 2(\nu - \xi) = \tfrac{1}{2}(\pi^4 + \pi_1^4) \quad \text{(i)}$$

Again $$e^{\nu\sqrt{-1}} = \frac{2\pi_1\kappa}{\sin I} = \sqrt{\frac{\pi_1\kappa}{\pi\kappa_1}};$$

therefore $$\cos 2\nu = \frac{\pi_1^2\kappa^2 + \pi^2\kappa_1^2}{2\pi\pi_1\kappa\kappa_1},$$

or $$\sin^2 I \cos 2\nu = 2(\pi^2\kappa_1^2 + \pi_1^2\kappa^2) \quad \text{(ii)}$$

Similarly $$\sin I \cos^2 \tfrac{1}{2} I \cos(2\xi - \nu) = \pi^3\kappa + \pi_1^3\kappa_1 \quad \text{(iii)}$$

$$\sin I \sin^2 \tfrac{1}{2} I \cos(2\xi + \nu) = \pi\kappa^3 + \pi_1\kappa_1^3 \quad \text{(iv)}$$

$$\sin I \cos I \cos \nu = (\pi\kappa_1 + \pi_1\kappa)(\pi\pi_1 - \kappa\kappa_1) \quad \text{(v)}$$

$$\sin^2 I \cos 2\xi = 2(\pi^2\kappa^2 + \pi_1^2\kappa_1^2) \quad \text{(vi)}$$

and $$1 - \tfrac{3}{2}\sin^2 I = \pi^2\pi_1^2 - 4\pi\pi_1\kappa\kappa_1 + \kappa^2\kappa_1^2 \quad \text{(vii)}$$

Now $\pi^4 = P^4p^4 - 4P^3p^3Qqe^{N\sqrt{-1}} + 6P^2p^2Q^2q^2e^{2N\sqrt{-1}} - 4PpQ^3q^3e^{3N\sqrt{-1}} + Q^4q^4e^{4N\sqrt{-1}},$

and $\pi_1^4 =$ same with $e^{-N\sqrt{-1}}$ written for $e^{N\sqrt{-1}}$,

therefore $\tfrac{1}{2}(\pi^4 + \pi_1^4) = P^4p^4 - 4P^3p^3Qq \cos N + 6P^2p^2Q^2q^2 \cos 2N - 4PpQ^3q^3 \cos 3N + Q^4q^4 \cos 4N,$

so that the part independent of N in (i) is P^4p^4 or $\cos^4 \tfrac{1}{2}\omega \cos^4 \tfrac{1}{2} i$.

Again $\pi_1 \kappa = PQp^2 - PQq^2 + P^2pqe^{N\sqrt{-1}} - Q^2pqe^{-N\sqrt{-1}}$,

and $\pi_1^2 \kappa^2 = P^2Q^2(p^2-q^2)^2 - 2P^2Q^2p^2q^2 + 2PQ(p^2-q^2)[P^2pqe^{N\sqrt{-1}} - Q^2pqe^{-N\sqrt{-1}}]$
$+ P^4p^2q^2e^{2N\sqrt{-1}} + Q^4p^2q^2e^{-2N\sqrt{-1}}$,

and $\pi^2 \kappa_1^2 =$ same with $e^{-N\sqrt{-1}}$ written for $e^{N\sqrt{-1}}$,

so that the part independent of N in (ii) is

$$4P^2Q^2\{(p^2-q^2)^2 - 2p^2q^2\},$$

or

$$4P^2Q^2\{(p^2+q^2)^2 - 6p^2q^2\},$$

or

$$\sin^2\omega\{1 - \tfrac{3}{2}\sin^2 i\}.$$

Similarly, the part independent of N in (iii) is

$$2P^3p^3Qp \quad \text{or} \quad \sin\omega\cos^2\tfrac{1}{2}\omega\cos^4\tfrac{1}{2}i;$$

and in (iv) is $2Q^3p^3Pp$ or $\sin\omega\sin^2\tfrac{1}{2}\omega\cos^4\tfrac{1}{2}i$.

Again $\pi\kappa_1 + \pi_1\kappa = 2PQ(p^2-q^2) + (P^2-Q^2)pqe^{N\sqrt{-1}} + (P^2-Q^2)pqe^{-N\sqrt{-1}}$,

and $\pi\pi_1 - \kappa\kappa_1 = (P^2-Q^2)(p^2-q^2) - 2PQpqe^{N\sqrt{-1}} - 2PQpqe^{-N\sqrt{-1}}$;

therefore the part independent of N in (v) is

$$2PQ(P^2-Q^2)(p^2-q^2)^2 - 4PQ(P^2-Q^2)p^2q^2,$$

or

$$2PQ(P^2-Q^2)(1-6p^2q^2),$$

or

$$\sin\omega\cos\omega\,(1 - \tfrac{3}{2}\sin^2 i).$$

Again $\pi\kappa = PQp^2 + (P^2-Q^2)pqe^{N\sqrt{-1}} - PQq^2e^{2N\sqrt{-1}}$,

$\pi_1\kappa_1 =$ same with $e^{-N\sqrt{-1}}$ for $e^{N\sqrt{-1}}$,

therefore the part independent of N in (vi) is

$$4P^2Q^2p^4 \quad \text{or} \quad \sin^2\omega\cos^4\tfrac{1}{2}i.$$

Again $\pi^2\pi_1^2 - 4\pi\pi_1\kappa\kappa_1 + \kappa^2\kappa_1^2 = 1 - 6\pi\pi_1\kappa\kappa_1$

But $\pi\kappa = PQp^2 + (P^2-Q^2)pqe^{N\sqrt{-1}} - PQq^2e^{2N\sqrt{-1}}$,

and $\pi_1\kappa_1 =$ same with $e^{-N\sqrt{-1}}$ instead of $e^{N\sqrt{-1}}$,

therefore the part independent of N in (vii) is

$$1 - 6\{P^2Q^2p^4 + (P^2-Q^2)^2p^2q^2 + P^2Q^2q^4\},$$

which reduces to

$$(1 - \tfrac{3}{2}\sin^2\omega)(1 - \tfrac{3}{2}\sin^2 i).$$

Proceeding in a similar manner, it will easily be seen that the parts independent of N in the expressions $\cos^4\tfrac{1}{2}I\sin 2(\nu-\xi)$; $\sin^2 I\sin 2\nu$; $\sin I\cos^2\tfrac{1}{2}I\sin(2\xi-\nu)$; $\sin I\sin^2\tfrac{1}{2}I\sin(2\xi+\nu)$; $\sin I\cos I\sin\nu$ and $\sin^2 I\sin 2\xi$ are all zero, so that the mean values of the semi-ranges are as given above.

As then f is the ratio of the mean value of a coefficient to the coefficient itself, and the mean value of the coefficients have just been found, it follows that the various values of $\frac{1}{\mathrm{f}}$ which are required are :—

(i). $\dfrac{\cos^4\frac{1}{2}\omega\cos^4\frac{1}{2}i}{\cos^4\frac{1}{2}I}$; (ii). $\dfrac{\sin^2\omega\,(1-\frac{3}{2}\sin^2 i)}{\sin^2 I}$; (iii). $\dfrac{\sin\omega\cos^2\frac{1}{2}\omega\cos^4\frac{1}{2}i}{\sin I\cos^2\frac{1}{2}I}$;

(iv). $\dfrac{\sin\omega\sin^2\frac{1}{2}\omega\cos^4\frac{1}{2}i}{\sin I\sin^2\frac{1}{2}I}$; (v). $\dfrac{\sin\omega\cos\omega\,(1-\frac{3}{2}\sin^2 i)}{\sin I\cos I}$; (vi). $\dfrac{\sin^2\omega\cos^4\frac{1}{2}i}{\sin^2 I}$;

(vii). $\dfrac{(1-\frac{3}{2}\sin^2\omega)\,(1-\frac{3}{2}\sin^2 i)}{1-\frac{3}{2}\sin^2 I}$; (viii). $\dfrac{1\cdot46407\,k_2}{\sqrt{\{1+(0\cdot46407\times k_2)^2+0\cdot92814\,k_2\cos 2\nu\}}}$, where

k_2 is the value of $\frac{1}{\mathrm{f}}$ in (ii); (ix). $\dfrac{1\cdot46407\,k_1}{\sqrt{\{1+(0\cdot46407\times k_1)^2+0\cdot92814\,k_1\cos\nu\}}}$, where k_1 is the value of $\frac{1}{\mathrm{f}}$ in (v), the two latter being for the K_2 and K_1 tides respectively.

The angle I ranges from 18° 18′·5, when it is $\omega - i$, to 28° 36′·1, when it is $\omega + i$, and tables have been constructed giving $\frac{1}{\mathrm{f}}$ and f for every 0°·1 between these limits.

The coefficients for the over-tides and compound tides may be found from tables of squares and cubes, and by multiplication.

19.

Evaluation of the Quantities s, p, h, p_1, and N.

The quantities s, p, h, p_1, and N required in the calculations of the arguments and coefficients may be computed from the formulæ given in the preface to Hansen's *Tables de la Lune*, page 15. These are for 0^h, January 0, 1800 :—

$$g = 110^\circ\,19'\,33''\cdot64 + (13\times360^\circ + 331158''\cdot3715)\,(t-1800) + 49''\cdot435\left(\frac{t-1800}{100}\right)^2 + 0''\cdot050073\left(\frac{t-1800}{100}\right)^3,$$

$$g' = 0^\circ\,24'\,28''\cdot22 + (360^\circ - 33''\cdot9218)\,(t-1800) - 0''\cdot5612\left(\frac{t-1800}{100}\right)^2,$$

$$\omega = 192^\circ\,7'\,21''\cdot91 + 216115''\cdot2207\,(t-1800) - 44''\cdot323\left(\frac{t-1800}{100}\right)^2 - 0''\cdot043759\left(\frac{t-1800}{100}\right)^3,$$

$$\omega' = 246^\circ\,13'\,50''\cdot28 + 69690''\cdot9809\,(t-1800) - 6''\cdot518\left(\frac{t-1800}{100}\right)^2 - 0''\cdot007159\left(\frac{t-1800}{100}\right)^3,$$

$$\Theta = 326^\circ\,43'\,28''\cdot85 + 69629''\cdot3961\,(t-1800) - 8''\cdot189\left(\frac{t-1800}{100}\right)^2 - 0''\cdot007159\left(\frac{t-1800}{100}\right)^3,$$

where g and g' are the mean anomalies of the moon and sun respectively, ω and ω' the distances from the moon's and sun's perigees to the ascending node, Θ the supplement of the longitude of the ascending node, and t the time in Julian years of $365\frac{1}{4}$ days;

so that

$$N = 360^\circ - \Theta,$$
$$p = \omega - \Theta,$$
$$p_1 = \omega' - \Theta,$$
$$s = g + p,$$
$$h = g' + p_1.$$

These formulæ when reduced to a more convenient epoch and to forms appropriate to the present investigation become

$$
\begin{aligned}
s &= 150^\circ\!\cdot\!0419 + [13 \times 360^\circ + 132^\circ\!\cdot\!67900]\ T + 13^\circ\!\cdot\!1764\ D + 0^\circ\!\cdot\!5490165\ H,\\
p &= 240^\circ\!\cdot\!6322 + 40^\circ\!\cdot\!69035\ T + 0^\circ\!\cdot\!1114\ D + 0^\circ\!\cdot\!0046418\ H,\\
h &= 280^\circ\!\cdot\!5287 + 360^\circ\!\cdot\!00769\ T + 0^\circ\!\cdot\!9856\ D + 0^\circ\!\cdot\!0410686\ H,\\
p_1 &= 280^\circ\!\cdot\!8748 + 0^\circ\!\cdot\!01711\ T + 0^\circ\!\cdot\!000047\ D,\\
N &= 285^\circ\!\cdot\!9569 - 19^\circ\!\cdot\!34146\ T - 0^\circ\!\cdot\!0529540\ D,
\end{aligned}
$$

where T is the number of Julian years of $365\frac{1}{4}$ mean solar days,

D the number of mean solar days,

H the number of mean solar hours,

after 0^h Greenwich mean time, January 1, 1880.

From these coefficients it appears that

$$
\begin{aligned}
\sigma &= 0^\circ\!\cdot\!5490165,\\
\varpi &= 0^\circ\!\cdot\!0046418,\\
\eta &= 0^\circ\!\cdot\!0410686,
\end{aligned}
$$

whence

$$\gamma = 15^\circ\!\cdot\!0410686.$$

For the purpose of using the forms for the harmonic analysis of the tidal observations, these formulæ may be reduced to yet more convenient and simple forms.

The mean values of N and p_1 are required and, for the treatment of the L and M_1 tides, the mean value of $p - \xi$ denoted by P.

Half the coefficients of T may therefore be added once for all, and these three quantities written,

$$
\begin{aligned}
N &= 276^\circ\!\cdot\!2861 - 0^\circ\!\cdot\!05295\ D - 19^\circ\!\cdot\!34146\ T,\\
p_1 &= 280^\circ\!\cdot\!8833 + 0^\circ\!\cdot\!00005\ D + 0^\circ\!\cdot\!01711\ T,\\
P + \xi &= 261^\circ\!\cdot\!0 + 0^\circ\!\cdot\!111\ D + 40^\circ\!\cdot\!69\ T,
\end{aligned}
$$

where T is simply the number of years, whether there be leap-years or not among them, since 1880 and D the number of days from January 1, numbered as zero, up to the first day of the year to be analysed.

Now suppose, d to denote the number of quarter days, either one, two, or three in excess of the Julian years, which have elapsed since 0^h January 1, 1880 up to 0^h January 1 of the year in question; let D denote the same as before, and let L be the east longitude of the place of observation in hours and decimals of hours, then the formulæ give for s_0, p_0, h_0, the values of s, p and h at 0^h of the first day,

$$
\begin{aligned}
s_0 &= 150^\circ\!\cdot\!0419 + 132^\circ\!\cdot\!67900\ T + 3^\circ\!\cdot\!29410\ d + 13^\circ\!\cdot\!1764\ D - 0^\circ\!\cdot\!54902\ L,\\
p_0 &= 240^\circ\!\cdot\!6322 + 40^\circ\!\cdot\!69035\ T + 0^\circ\!\cdot\!02785\ d + 0^\circ\!\cdot\!1114\ D - 0^\circ\!\cdot\!00464\ L,\\
h_0 &= 280^\circ\!\cdot\!5287 + 0^\circ\!\cdot\!00769\ T + 0^\circ\!\cdot\!24641\ d + 0^\circ\!\cdot\!9856\ D - 0^\circ\!\cdot\!04107\ L.
\end{aligned}
$$

In these formulæ T is an integer, being the excess of the year in question above 1880, and d is to be determined thus:—If the excess of the year above 1880 divided by 4 leaves remainder 3, d is 1; if remainder 2, it is 2; if remainder 1, it is 3; and if remainder zero, it is zero. For example for 1895, $T = 15$, $d = 1$; because from 0^h January 1, 1880 to 0^h January 1, 1895 is 15 Julian years and a quarter day. For all dates after February 28, 1900, one day's motion must be subtracted from s_0, p_0, h_0, p, and $P + \xi$, and one day's motion added to N.

The terms in L may be described as corrections for longitude: the multiple of 360° which occurred in s and h are omitted as T is essentially an integer. If it be preferred, the values of s_0 and N may be extracted from the *Nautical Almanac*, and h_0 is (neglecting nutation) the sidereal time reduced to angle. Also p_0 can be taken from the tables in Chapter VII which are reprinted from those given at pages 299 and 300 of Hansen's *Tables de la Lune*.

The results of the various kinds of tides are scattered throughout the preceding pages, and it will therefore be convenient to collect them together. In order to present the results in a form convenient for computation, each argument is given by reference to any previous argument which contains the same element. In the following schedule Arg. M_2 and Fac. M_2 (for example) mean the argument and factor computed for the tide M_2.

Schedule of Arguments at 0^h *of the First Day, and Factors for the Ensuing Year.*

Tide	Initial Argument. $V_0 + u$	Factor for Reduction. $\frac{1}{f}$
S_1 S_2 S_3 S_4	zero	unity
P	$- h_0 + \frac{1}{2}\pi$	unity
T	$- (h_0 - p_1)$	unity
M_1	$(h_0 - \nu) - (s_0 - \xi) + Q - \frac{1}{2}\pi$, where $\tan Q = \frac{1}{2}\tan P$	Fac. O $\div \sqrt{\frac{5}{2} + \frac{3}{2}\cos 2P}$
M_2	$2(h_0 - \nu) - 2(s_0 - \xi)$	$\left(\frac{\cos\frac{1}{2}\omega\cos\frac{1}{2}i}{\cos\frac{1}{2}I}\right)^4$
M_3	$\frac{3}{2}$ Arg. M_2	$(\text{Fac. } M_2)^{\frac{3}{2}}$
M_4	2 Arg. M_2	$(\text{Fac. } M_2)^2$
M_6	3 Arg. M_2	$(\text{Fac. } M_2)^3$
M_8	4 Arg. M_2	$(\text{Fac. } M_2)^4$
K_2	$2h_0 - 2\nu''$, where $\tan 2\nu'' = \frac{\sin 2\nu}{\cos 2\nu + \cdot 464 \times k}$	$\frac{1\cdot 46407\, k}{\sqrt{\{1 + (\cdot 464 \times k)^2 + \cdot 928\, k\cos 2\nu\}}}$ where $k = \frac{\sin^2\omega\,(1 - \frac{3}{2}\sin^2 i)}{\sin^2 I}$
K_1	$h_0 - \nu' - \frac{1}{2}\pi$, where $\tan\nu' = \frac{\sin\nu}{\cos\nu + \cdot 464 \times k}$	$\frac{1\cdot 46407\, k}{\sqrt{\{1 + (\cdot 464 \times k)^2 + \cdot 928\, k\cos\nu\}}}$ where $k = \frac{\sin 2\omega\,(1 - \frac{3}{2}\sin^2 i)}{\sin 2I}$
N	Arg. $M_2 - (s_0 - p_0)$	Fac. M_2
2N	Arg. N $- (s_0 - p_0)$	Fac. M_2

Schedule of Arguments.—(Continued).

Tide	Initial Argument. $V_0 + u$	Factor for Reduction. $\frac{1}{f}$
L	Arg. $M_2 + (s_0 - p_0) - R + \pi$ where $\tan R = \dfrac{\sin 2P}{\frac{1}{6}\cot^2 \frac{1}{2}I - \cos 2P}$	Fac. $M_2 \div \sqrt{1 - 12 \tan^2 \frac{1}{2}I \cos 2P}$
ν	Arg. $M_2 + (s_0 - p_0)\, 2h_0 - 2s_0$	Fac. M_2
O	$(h_0 - \nu) - 2(s_0 - \xi) + \frac{1}{2}\pi$	$\dfrac{\sin \omega \cos^2 \frac{1}{2}\omega \cos^4 \frac{1}{2}i}{\sin I \cos^2 \frac{1}{2}I}$
OO	$(h_0 - \nu) + 2(s_0 - \xi) - \frac{1}{2}\pi$	$\dfrac{\sin \omega \sin^2 \frac{1}{2}\omega \cos^4 \frac{1}{2}i}{\sin I \sin^2 \frac{1}{2}I}$
Q	Arg. O $- (s_0 - p_0)$	Fac. O
J	$(h_0 - \nu) + (s_0 - p_0) - \frac{1}{2}\pi$	$\dfrac{\sin 2\omega (1 - \frac{3}{2}\sin^2 i)}{\sin 2I}$
MS	Arg. M_2	Fac. M_2
μ or 2MS	Arg. M_4	Fac. M_4
2SM	$2\pi -$ Arg. M_2	Fac. M_2
M_2K_1	Arg. M_2 + Arg. K_1	Fac. $M_2 \times$ Fac. K_1
$2M_2K_1$	Arg. M_4 − Arg. K_1	Fac. $M_4 \times$ Fac. K_1
M_2N	Arg. M_2 + Arg. N	Fac. $M_2 \times$ Fac. N
MSf	$2\pi -$ Arg. M_2	Fac. M_2
Mm	$s_0 - p_0$	$\dfrac{(1 - \frac{3}{2}\sin^2 \omega)(1 - \frac{3}{2}\sin^2 i)}{1 - \frac{3}{2}\sin^2 I}$
Mf	$2(s_0 - \xi)$	$\dfrac{\sin^2 \omega \cos^4 \frac{1}{2}i}{\sin^2 I}$
Sa	h_0	unity
Ssa	$2h_0$	unity

CHAPTER VII.

DESCRIPTION OF THE NUMERICAL HARMONIC ANALYSIS OF THE TIDES.

1.

Measurement of the Heights of the Water.

The tide-gauge gives a graphical record of the height of the water above some known datum for every instant of time. The first operation performed on the tidal record is the measurement, in feet and decimals, at every mean solar hour of the height of the water above the true zero of the gauge, the height of which relatively to the datum is known. The period chosen for analysis is about one year, and the first measurement corresponds to noon, but it has been found inconvenient hitherto to have the same initial noon at the several ports.

It would seem, at first sight, preferable to take the measurements at each lunar hour; but the whole of the actual process in use is based on measurements taken at the mean solar hours, and a change to lunar time would involve a great deal of fresh labour and expense.

The process used in reducing the short-period tides differs entirely from that employed for the long-period tides.

2.

Short-period Tides:—Manipulation of the Measurements.

If T be the period of any one of the diurnal tides, or the double period of any one of the semi-diurnal tides, it approximates more or less nearly to 24 mean solar hours, and if it be divided into 24 equal parts, each part may be spoken of as a T-hour, while for brevity mean solar time will be referred to as S-time.

Let it be supposed, now, that there are two clocks, each marked with 360° or 24 hours, and that the hand of the first or S-clock goes round once in 24 S-hours, and that of the second or T-clock once in 24 T-hours; and that the two clocks are started at 0° or 0^h at noon of the initial day. For the sake of distinctness, let a T-hour be longer than an S-hour, so that the T-clock goes slower than the S-clock.

The measurements of the tide-curve give the heights of the water at each S-hour, and it is required from these data to determine the height of the water at each T-hour. For this end, it is necessary to count T-time, but it must be done with reference to S-time, and moreover the time must be specified as an integral number of hours.

Beginning, then, with 0^h of the first day, it is necessary to count 0, 1, 2, &c., as the T-hand comes up to its hour marks. But as the S-hand gains on the T-hand, there will come a time when, the T-hand being exactly at the p hour mark, the S-hand is nearly as far as $p+\frac{1}{2}$. When, however, the T-hand has advanced to the $p+1$ hour mark, the S-hand will be a little beyond $p+1+\frac{1}{2}$, that is to say, a little less than half-an-hour before $p+2$. Counting, then, the T-hours in S-time, it is necessary to jump from p to $p+2$. The counting will go on continuously for a number of hours nearly equal to $2p$, and then another number will be dropped, and so on throughout the whole year.

If the T-hand went faster than the S-hand, it is obvious that one number would be repeated at two successive hours instead of being dropped. Each such process may be described as a 'change.'

Now, if there is a sheet marked for entries of heights of water according to T-hours from results measured in S-hours, the S-measurements must be entered continuously up to p; then comes a 'change' and the dropping of one of the S-series, after which the entry goes on continuously until another 'change' when another is dropped, and so on.

Since a 'change' occurs when a T-hour falls almost exactly between two S-hours, it will be more accurate to insert the two S-entries which fall on each side of the truth. If this be done, the whole of the S-series of measurements will be entered on the T-sheet. Similarly, if it is the T-hand which goes faster than the S-hand, a gap may be left in the T-series instead of duplicating an entry.

For the analysis of the T-tide there is, therefore, prepared a sheet arranged in rows and columns: each row corresponds to one T-day and the columns are marked 0^h, 1^h and . . . . 23^h, the 0^h of which may be called a T-noon. A dot is put in each space for the entry, and where there is a 'change' two dots are put if there is to be a double entry, or a bar if there is to be no entry, while black vertical lines mark the end of each S-day. The black vertical lines will of course fall into slightly irregular diagonal lines across the page, being steeper and steeper the more nearly T-time approaches to S-time. They slope downwards from right to left if the T-hour is longer than the S-hour, and the other way in the opposite case. The 'changes' also run diagonally with a slope in the opposite direction to that of the black lines when the T-hour is longer than the S-hour, and in the same direction in the opposite case.

These 'changes' and black lines will be found exhibited in the specimen of the reductions given at the end of this chapter.

Since the first day is numbered 1, and the first hour 0^h, it follows that to find the period which has elapsed from 0^h of the first day, it is necessary to subtract 1 from the number of the day and to add 1 to the number of the hour.

For each class of tide there are five pages in the computation forms, each page occupying two in the specimen of the reductions at the end of this chapter, giving in all about 370 values for the height of the water at each of the 24 special hours: the number of values for each hour varies slightly according as more or less changes fall into each column.

The numbers entered in each column are summed on each of the five pages: the five sets of results are now summed and the results divided each by the proper divisor for its column, thus giving a mean result for that column. In this way 24 numbers are found which give the mean height of the water at each of the 24 special hours.

It is obvious that if this process were continued over a very long time, in the end, the tide under analysis would be extracted from among all the others, and the heights thus found would accurately represent the heights of the water due to this tide; but as the process only extends over about a year, the elimination of the others is not quite complete.

3.

Short-period Tides:—Selection of Periods for Analysis.

The elimination of the effects of the other tides may be improved by choosing the period for analysis not exactly equal to one year. For, suppose that the expression for the height of the water is

$$A_1 \cos n_1 t + B_1 \sin n_1 t + A_2 \cos n_2 t + B_2 \sin n_2 t$$

where n_2 is nearly equal to n_1, and that it is required to eliminate the n_2-tide so as to be left only with the n_1-tide.

The expression for the height of the water is equal to

$$\{A_1 + A_2 \cos (n_1 - n_2)t - B_2 \sin (n_1 - n_2)t\} \cos n_1 t$$
$$+ \{B_1 + A_2 \sin (n_1 - n_2)t + B_2 \cos (n_1 - n_2)t\} \sin n_1 t,$$

so that the tide may be regarded as oscillating with a speed n_1 but with slowly varying range.

Now, in the column appertaining to any hour in the form, $n_1 t$ is a multiple of 15° if n_1 be a diurnal, and of 30°, if n_1 be a semi-diurnal tide. Consider the column headed 'p-hours', then $n_1 t = 15°p$ for diurnals, and $30°p$ for semi-diurnals.

Hence the sum of all entries, supposing there are q of them in the column numbered p-hours, is for diurnal tides

$$\cos 15°p \left\{ A_1 q + A_2 \left[\cos (n_1 - n_2) \frac{15p}{n_1} + \cos (n_1 - n_2) \left(\frac{2\pi}{n_1} + \frac{15p}{n_1} \right) + \cos (n_1 - n_2) \left(2\frac{2\pi}{n_1} + \frac{15p}{n_1} \right) \right. \right.$$
$$\left. \left. + \&c. \right] + B_2 [\&c.] \right\} \quad + \quad \sin 15°p \left\{ \&c. \right\}$$

and for semi-diurnal tides, the arguments of all the circular functions in the expression are to be doubled.

Now such a number of terms is to be chosen that the series by which A_2 and B_2 are multiplied may vanish. This is exactly the case if the series is exactly re-entrant and is nearly the case if nearly re-entrant.

The condition is exactly satisfied where r is either a positive or negative integer for diurnal tides, if $(n_1 - n_2) q \frac{2\pi}{n_1} = 2\pi r$; and for semi-diurnal tides if $(n_1 - n_2) q \frac{4\pi}{n_1} = 2\pi r$: that is to say, if

$$(n_1 - n_2) q = n_1 r \quad \text{for diurnal tides;}$$

or

$$(n_1 - n_2) q = \tfrac{1}{2} n_1 r \quad \text{for semi-diurnal tides.}$$

It is not worth while attempting to eliminate the effects of the semi-diurnal tides on the diurnal tides, and *vice versâ*, because any period will satisfy the above equations within the fraction of a day, and owing to the incommensurability of the speeds, it is impossible to avoid being wrong to that amount.

It is of course impossible to choose for each tide n_1, a period which shall minimise the effects of more than one of the short-period tides n_2 in vitiating the values of the mean semi-ranges of the tide n_1; accordingly the periods have been chosen so as to minimise the effect of the principal solar semi-diurnal S_2 upon the principal lunar semi-diurnal M_2, and of M_2 on the other semi-diurnal tides: in the case of the diurnal tides the periods are chosen to minimise the effect of either O or K_1.

In analysing for the S_2 tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2(\gamma - \eta) = 2 \times 15^\circ \text{ per hour},$$
$$n_2 = 2(\gamma - \sigma),$$
$$n_1 - n_2 = 2(\sigma - \eta) = 1^\circ{\cdot}0158958 \text{ per hour};$$

the equation therefore is
$$1{\cdot}0158958\, q = 15\, r;$$

and if $r = 25$, $q = 369{\cdot}13$. Thus 25 periods of $2(\sigma - \eta)$ is 369·13 mean solar days, so that in order to get as great accuracy as possible, the series must be summed over 369·13 days. Now, this is true of all the columns, and as each must have the same number of entries, the period which should be chosen is 369 days.

In analysing for the M_2 tide, it is required to find the period which will minimise the effect of the S_2 tide.

Here
$$n_1 = 2(\gamma - \sigma) = 2 \times 14^\circ{\cdot}4920521 \text{ per hour},$$
$$n_2 = 2(\gamma - \eta),$$
$$n_1 - n_2 = 2(\eta - \sigma) = -1^\circ{\cdot}0158958 \text{ per hour};$$

hence, taking r negative,
$$1{\cdot}0158958\, q = 14{\cdot}4920521\, r;$$

and if $r = 25$, $q = 356{\cdot}63$, so that the period should be 357 days, corresponding to a period of $369^d\ 12^h$ mean solar time.

In analysing for the K_2 tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma = 2 \times 15^\circ{\cdot}0410686 \text{ per hour},$$
$$n_2 = 2(\gamma - \sigma),$$
$$n_1 - n_2 = 2\sigma = 1^\circ{\cdot}0980330 \text{ per hour};$$

hence
$$1{\cdot}0980330\, q = 15{\cdot}0410686\, r;$$

and if $r = 27$, $q = 369{\cdot}85$.

In analysing for the K_1 tide, it is required to find the period which will minimise the effect of the O tide.

Here
$$n_1 = \gamma = 15^\circ{\cdot}0410686 \text{ per hour},$$
$$n_2 = \gamma - 2\sigma,$$
$$n_1 - n_2 = 2\sigma = 1^\circ{\cdot}0980330 \text{ per hour},$$

which again gives $q = 369 \cdot 85$, so that for both the K tides the period should be 370 days, corresponding to a period of $369^d\ 0^h$ mean solar time.

In analysing for the N tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma - 3\sigma + \varpi = 2 \times 14^\circ \cdot 2198648 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = -(\sigma - \varpi) = -0^\circ \cdot 5443747 \text{ per hour;}$$

hence
$$0 \cdot 5443747\, q = 14 \cdot 2198648\, r;$$

and if $r = 13$, $q = 339 \cdot 58$, so that the period should be 340 days, corresponding to a period of $358^d\ 16^h$ mean solar time.

In analysing for the L tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma - \sigma - \varpi = 2 \times 14^\circ \cdot 7642394 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = \sigma - \varpi = 0^\circ \cdot 5443747 \text{ per hour;}$$

hence
$$0 \cdot 5443747\, q = 14 \cdot 7642394\, r;$$

and if $r = 13$, $q = 352 \cdot 58$, so that the period should be 353 days, corresponding to a period of $358^d\ 15^h$ mean solar time.

In analysing for the ν tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma - 3\sigma - \varpi + 2\eta = 2 \times 14^\circ \cdot 2562915 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = -\sigma - \varpi + 2\eta = -0^\circ \cdot 4715211 \text{ per hour;}$$

hence
$$0 \cdot 4715211\, q = 14 \cdot 2562915\, r;$$

and if $r = 11$, $q = 332 \cdot 58$, so that the period should be 333 days, corresponding to a period of $350^d\ 9^h$ mean solar time.

In analysing for the λ tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma - \sigma + \varpi - 2\eta = 2 \times 14^\circ \cdot 7278127 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = \sigma + \varpi - 2\eta = 0^\circ \cdot 4715211 \text{ per hour;}$$

hence
$$0 \cdot 4715211\, q = 14 \cdot 7278127\, r;$$

and if $r = 11$, $q = 343 \cdot 58$, so that the period should be 344 days, corresponding to a period of $350^d\ 9^h$ mean solar time.

In analysing for the 2N tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma - 4\sigma + 2\varpi = 2 \times 13^\circ\cdot 9476774 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = -2(\sigma - \varpi) = -1^\circ\cdot 0887494 \text{ per hour;}$$
hence
$$1\cdot 0887494\, q = 13\cdot 9476774\, r;$$
and if $r = 26$, $q = 333\cdot 08$, so that the period should be 333 days, corresponding to a period of $358^d\, 3^h$ mean solar time.

In analysing for the T tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma - 3\eta = 2 \times 14^\circ\cdot 9794657 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = 2\sigma - 3\eta = 0^\circ\cdot 9748272 \text{ per hour;}$$
hence
$$0\cdot 9748272\, q = 14\cdot 9794657\, r;$$
and if $r = 24$, $q = 368\cdot 79$, so that the period should be 369 days, corresponding to a period of $369^d\, 12^h$ mean solar time.

In analysing for the R tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma - \eta = 2 \times 15^\circ\cdot 0205343 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = 2\sigma - \eta = 1^\circ\cdot 0569644 \text{ per hour;}$$
hence
$$1\cdot 0569644\, q = 15\cdot 0205343\, r;$$
and if $r = 25$, $q = 355\cdot 28$; or if $r = 26$, $q = 369\cdot 49$, so that the period should be either 355 days or 369 days, corresponding to a period of $354^d\, 12^h$, or $368^d\, 12^h$ mean solar time respectively.

In analysing for the μ tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma - 4\sigma + 2\eta = 2 \times 13^\circ\cdot 9841042 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = -2(\sigma - \eta) = -1^\circ\cdot 0158958 \text{ per hour;}$$
hence
$$1\cdot 0158958\, q = 13\cdot 9841042\, r;$$
and if $r = 24$, $q = 330\cdot 37$; or if $r = 25$, $q = 344\cdot 13$, so that the period should be either 330 days or 344 days, corresponding to a period of $353^d\, 23^h$, or $369^d\, 0^h$ mean solar time respectively.

In analysing for the 2SM tide, it is required to find the period which will minimise the effect of the M_2 tide.

Here
$$n_1 = 2\gamma + 2\sigma - 4\eta = 2 \times 15^\circ\cdot 5079479 \text{ per hour,}$$
$$n_2 = 2\gamma - 2\sigma,$$
$$n_1 - n_2 = 4(\sigma - \eta) = 2^\circ\cdot 0317916 \text{ per hour;}$$
hence
$$2\cdot 0317916\, q = 15\cdot 5079479\, r;$$

and if $r = 48$, $q = 366\cdot37$; or if $r = 49$, $q = 374\cdot00$; or if $r = 50$, $q = 381\cdot63$, so that the period should be 366 days, or 374 days, or 382 days, corresponding to a period of $354^d\ 0^h$, $361^d\ 18^h$, or $369^d\ 12^h$ mean solar time respectively.

In analysing for the O tide, it is required to find the period which will minimise the effect of the K_1 tide.

Here
$$n_1 = \gamma - 2\sigma = 13^\circ\cdot9430356 \text{ per hour},$$
$$n_2 = \gamma,$$
$$n_1 - n_2 = -2\sigma = -1^\circ\cdot0980330 \text{ per hour};$$
hence
$$1\cdot0980330\, q = 13\cdot9430356\, r;$$
and if $r = 27$, $q = 342\cdot85$, so that the period should be 343 days, corresponding to a period of $369^d\ 0^h$ mean solar time.

In analysing for the P tide, it is open to question whether it is better to minimise the effect of the K_1 tide or of the O tide.

In the case of the K_1 tide,
$$n_1 = \gamma - 2\eta = 14^\circ\cdot9589314 \text{ per hour},$$
$$n_2 = \gamma,$$
$$n_1 - n_2 = -2\eta = -0^\circ\cdot0821372 \text{ per hour};$$
hence
$$0\cdot0821372\, q = 14\cdot9589314\, r;$$
and if $r = 2$, $q = 364\cdot24$.

In the case of the O tide,
$$n_2 = \gamma - 2\sigma,$$
$$n_1 - n_2 = 2(\sigma - \eta) = 1^\circ\cdot0158958 \text{ per hour};$$
hence
$$1\cdot0158958\, q = 14\cdot9589314\, r;$$
and if $r = 25$, $q = 368\cdot12$. It is better to abide by the last number, because in the former case $n_1 - n_2$ varies slowly and by this means the adequate elimination of both O and K_1 will be effected. The period should therefore be 368 days, corresponding to a period of $369^d\ 0^h$ mean solar time.

In analysing for the J tide, the same remark applies in regard to the K_1 tide or the O tide.

In the case of the K_1 tide,
$$n_1 = \gamma + \sigma - \varpi = 15^\circ\cdot5854433 \text{ per hour},$$
$$n_2 = \gamma,$$
$$n_1 - n_2 = \sigma - \varpi = 0^\circ\cdot5443747 \text{ per hour};$$
hence
$$0\cdot5443747\, q = 15\cdot5854433\, r;$$
and if $r = 12$, $q = 343\cdot56$; or if $r = 13$, $q = 372\cdot19$.

In the case of the O tide,
$$n_2 = \gamma - 2\sigma,$$
$$n_1 - n_2 = 3\sigma - \varpi = 1^\circ\cdot6424077 \text{ per hour};$$
hence
$$1\cdot6424077\, q = 15\cdot5854433\, r;$$
and if $r = 36$, $q = 341\cdot62$; or if $r = 39$, $q = 370\cdot09$.

Since in the latter case, when the effect of the O tide is minimized, $n_1 - n_2$ varies three times as fast as in the former when the K_1 tide is employed, it will be better to take the period either 342 days or 370 days, corresponding to a period of $329^d\ 4^h$, or $356^d\ 2^h$ mean solar time respectively.

In analysing for the Q tide the same remark applies in regard to the K_1 tide or the O tide.

In the case of the K_1 tide,

$$n_1 = \gamma - 3\sigma + \varpi = 13°\cdot3986609 \text{ per hour},$$

$$n_2 = \gamma,$$

$$n_1 - n_2 = -(3\sigma - \varpi) = -1°\cdot6424077 \text{ per hour};$$

hence

$$1\cdot6424077\, q = 13\cdot3986609\, r;$$

and if $r = 39$, $q = 318\cdot16$.

In the case of the O tide,

$$n_2 = \gamma - 2\sigma,$$

$$n_1 - n_2 = -(\sigma - \varpi) = -0°\cdot5443747 \text{ per hour};$$

hence

$$0\cdot5443747\, q = 13\cdot3986609\, r;$$

and if $r = 13$, $q = 319\cdot97$. As before, it will be better to take the period 318 days, corresponding to a period of $356^d\ 0^h$ mean solar time.

With regard to the quaterdiurnal and terdiurnal tides MS, M_2N, M_2K_1 and $2M_2K_1$ it does not matter what period is taken, but it seems reasonable to stop with the exact year of 365 mean solar days.

4.

Short-period Tides:—Augmenting Factors.

Returning now to the general notation and considering the 24 mean values pertaining to the 24 T-hours, it may be supposed that all the tides except the T-tide are adequately eliminated, and in fact, that this is the case will be found on reference to the *Report of the British Association for the Advancement of Science*, 1872, page 366, where the necessary corrections for the absence of complete elimination are given.

Now it is obvious that any one of the 24 values does not give the true height of the T-tide at that T-hour, but that it gives the average height of the water as due to the T-tide, estimated over half a T-hour before and after a T-hour. A correction must therefore be determined on this account.

The required expression for the height of the tide at any T-hour is

$$h = A_1 \cos\theta + B_1 \sin\theta + \&c. + A_r \cos r\theta + B_r \sin r\theta + \&c.$$

But the results of analysis gives instead of this, the mean of all the h's between the limits $\theta + \frac{a}{2}$ and $\theta - \frac{a}{2}$ where $a = 15°$.

If then Σ represents the summation between these limits, it follows that,

$$\begin{aligned} h\,a &= \Sigma\, h \\ &= \&c. + \Sigma\, A_r \cos r\theta + \Sigma\, B_r \sin r\theta + \&c. \\ &= \&c. + A_r \frac{2}{r} \sin\frac{ra}{2} \cos r\theta + B_r \frac{2}{r} \sin\frac{ra}{2} \sin r\theta + \&c., \end{aligned}$$

whence
$$h = \&c. + \frac{\sin\frac{ra}{2}}{\frac{ra}{2}} A_r \cos r\theta + \frac{\sin\frac{ra}{2}}{\frac{ra}{2}} B_r \sin r\theta + \&c.,$$
consequently, the coefficients expressing that oscillation which goes through its period r times in 24 T-hours must be augmented by the factor $\dfrac{\frac{ra}{2}}{\sin\frac{ra}{2}}$ to give the true A_r and B_r.

Remembering that a is 15°, and putting 1, 2, 3, &c., in succession for r, the augmenting factors for the diurnal, semi-diurnal, terdiurnal oscillations &c., become

$$\frac{7\cdot5\,\pi}{180 \sin 7^\circ\, 30'}; \qquad \frac{15\,\pi}{180 \sin 15^\circ}; \qquad \frac{22\cdot5\,\pi}{180 \sin 22^\circ\, 30'}; \ \&c.$$

The augmenting factors are therefore as follows:—

for A_1, B_1	1·00286,
A_2, B_2	1·01152,
A_3, B_3	1·02617,
A_4, B_4	1·04720,
A_6, B_6	1·11072,
A_8, B_8	1·20920.

In the case of the S-series of tides, since the numbers treated are the actual heights of the water exactly at the S-hours, no augmenting factors are required.

5.

Short-period Tides:—Determination of the Constants.

If now t denotes T-time expressed in hours and n is 15°, the height h, as expressed by the averaging process explained above, is given by the formula
$$h = A_0 + A_1 \cos nt + B_1 \sin nt + A_2 \cos 2nt + B_2 \sin 2nt + \&c.,$$
where t is 0, 1, 2 . . . 23.

Now $\Sigma \cos rnt$, from $t = 0$ to $t = 23$, is equal to zero, since there are corresponding positive and negative values of the cosine: similarly $\Sigma \sin rnt = 0$.

Also $\Sigma \begin{smallmatrix}\cos^2\\ \sin^2\end{smallmatrix} rnt = \Sigma\left(\frac{1}{2} \pm \frac{1}{2}\cos 2rnt\right) = 12$, $\Sigma \begin{smallmatrix}\cos\\ \sin\end{smallmatrix} rnt \begin{smallmatrix}\cos\\ \sin\end{smallmatrix} snt = \frac{1}{2}\Sigma\{\cos(r-s)nt \pm \cos(r+s)nt\} = 0$,
and $\Sigma \cos rnt \sin snt = \frac{1}{2}\Sigma\{\sin(r+s)nt - (r-s)nt\} = 0$, where r and s are any positive integers.

Therefore it follows that

$$A_0 = \frac{1}{24}\Sigma h; \quad A_1 = \frac{1}{12}\Sigma h \cos nt; \quad B_1 = \frac{1}{12}\Sigma h \sin nt; \quad A_2 = \frac{1}{12}\Sigma h \cos 2nt; \quad B_2 = \frac{1}{12}\Sigma h \sin 2nt;$$
and so on.

Also, since $n = 15°$, and t is an integer, all the cosines and sines involved will be found among the following:—0; $\pm \sin 15°$; $\pm \sin 30°$; $\pm \sin 45°$; $\pm \sin 60°$; $\pm \sin 75°$; ± 1. These are denoted in the computation forms by 0; $\pm S_1$; $\pm S_2$; $\pm S_3$; $\pm S_4$; $\pm S_5$; ± 1. This enables the forms to be arranged neatly as given in the specimen of the reductions at the end of this chapter, where the 24 hourly values to be submitted to analysis are entered continuously in columns I and II. The subsequent operations are sufficiently indicated by the headings to the columns, and it will be found on examination that the results are in reality the sums of the several series given above.

The A's and B's are thus deduced, and then $R = \sqrt{A^2 + B^2}$: it must be multiplied by the augmenting factor, already evaluated, to obtain the augmented R which when multiplied by $\frac{1}{f}$ gives H. Next the angle whose tangent is $\frac{B}{A}$ gives ζ, which must be added to the appropriate $V_0 + u$ to find κ. The form used will be found in the specimen of the reductions: it also serves for the final treatment of the long-period tides, except that there is no augmenting factor, and that the increase of n for $11\frac{1}{2}$ hours has to be added to ζ.

6.

Long-period Tides:—Formation and Clearance of Daily Means.

For the purpose of determining the tides of long-period, it is necessary to eliminate the oscillations of water level arising from the tides of short-period. As the quickest of the long-period tides has a period of many days, the height of the water at one instant for each day gives sufficient data. Thus there will, in a year's observations, be 365 heights to be submitted to harmonic analysis. In leap-year the last day's observation must be dropped, because the treatment is adapted for analysing 365 values.

In finding the value of the height of the water for each day, the algebraical mean of 24 consecutive hourly values, beginning with the height at noon, is taken: the result applies to the middle instant of the period 0^h to 23^h, that is to say, to $11^h\ 30^m$ at night.

The formation of a daily mean does not obliterate the oscillations of the short-period tides, because none of the latter, excepting those of the principal solar series, have commensurable periods in mean solar hours.

A correction or 'clearance of the daily mean' has therefore to be applied for all important tides of short-period excepting for the solar series.

Let $R \cos(nt - \zeta)$ be the expression for one of the tides of short-period, as evaluated by the harmonic analysis, and let a be the value of $nt - \zeta$ at any noon. Then the 24 consecutive hourly heights of the water due to this tide, beginning with that noon, are:—

$$R \cos a, \quad R \cos(n + a), \quad R \cos(2n + a) \quad . \ . \ . \ . \ . \ . \ . \ . \quad R \cos(23n + a).$$

Now the sum of these 24 quantities is $R \frac{\sin 12n}{\sin \frac{1}{2}n} \cos(a + 11\frac{1}{2}n)$, so that the 'clearance' is $-\frac{1}{24} R \frac{\sin 12n}{\sin \frac{1}{2}n} \cos(a + 11\frac{1}{2}n)$, and is additive.

It has been found, practically, that only three tides of short period, *viz.*, M_2, N and O exercise any appreciable effect, so that clearances for them have to be applied. It was formerly the custom to compute the clearances for these three tides for every day of the year, as above, and to correct the daily means accordingly: but in the present procedure, a single correction, for each of the three short-period tides, is applied to each of the final equations instead of to each daily mean. The process will be explained more fully below.

The late Professor J. C. Adams suggested an alternative plan in which the tide-predicting machine may be used for the evaluation of the sum of the clearances. It is evident that $R\cos(\alpha + 11\frac{1}{2}n)$ is the height of the tide n at $11^h\ 30^m$, and the same is true for each such tide. Hence if the tide predicter is used to run off a year of fictitious tides with the semi-range of each tide equal to $\frac{1}{24}\frac{\sin 12n}{\sin\frac{1}{2}n}$ of its true semi-range, and with all the solar series and the annual and semi-annual tides put at zero, the height given at each $11^h\ 30^m$ in the year is the sum for each day of all the clearances to be subtracted.

7.

Long-period Tides:—Final Equations.

The 365 daily means are then taken and their mean value found. This is the mean height of the water for the year, and even if the daily means are uncleared, the result cannot be sensibly vitiated.

The mean height is next subtracted from each of the daily means, leaving 365 quantities δh, the daily height of the water above the mean height. These quantities are to be the subject of harmonic analysis: and the tides chosen for evaluation are those which have been denoted above as Mm, Mf, MSf, Sa, Ssa.

Let

$$\begin{aligned}\delta h = &\ A\cos(\sigma - \varpi)t && + B\sin(\sigma - \varpi)t \\ &+ C\cos 2\sigma t && + D\sin 2\sigma t \\ &+ C'\cos 2(\sigma - \eta)t && + D'\sin 2(\sigma - \eta)t \\ &+ E\cos\eta t && + F\sin\eta t \\ &+ G\cos 2\eta t && + H\sin 2\eta t,\end{aligned}$$

where t is measured from the first $11^h\ 30^m$.

Now if l_1, l_2 are the increments in 24 mean solar hours of any two of the five arguments $(\sigma - \varpi)t$, $2\sigma t$, $2(\sigma - \eta)t$, ηt, $2\eta t$, and if A_1, B_1; A_2, B_2, are the corresponding coefficients of the cosine and sine in the expression for δh, and if δh_i be the value of δh at the $(i+1)^{th}$ $11^h\ 30^m$ in the year, then

$$\delta h_i = A_1\cos l_1 i + B_1\sin l_1 i + A_2\cos l_2 i + B_2\sin l_2 i + \&c.$$

and therefore, if the terms in A_2 and B_2 alone be written,

$$\delta h_i\cos l_1 i = \tfrac{1}{2}A_2\{\cos(l_1 + l_2)i + \cos(l_1 - l_2)i\} + \tfrac{1}{2}B_2\{\sin(l_1 + l_2)i - \sin(l_1 - l_2)i\} + \&c.$$

$$\delta h_i\sin l_1 i = \tfrac{1}{2}A_2\{\sin(l_1 + l_2)i + \sin(l_1 - l_2)i\} + \tfrac{1}{2}B_2\{-\cos(l_1 + l_2)i + \cos(l_1 - l_2)i\} + \&c.$$

Now let

$$\phi(x) = \tfrac{1}{2}\frac{\sin\frac{365}{2}x}{\sin\frac{1}{2}x},$$

so that

$$\phi(l_1 \pm l_2) = \tfrac{1}{2}\frac{\sin\frac{365}{2}(l_1 \pm l_2)}{\sin\frac{1}{2}(l_1 \pm l_2)};$$

then, it is clear that $\phi(x) = \phi(-x)$ and $\phi(0) = 182{\cdot}5$.

If, therefore, Σ denote the summation for the 365 values from $i = 0$ to $i = 364$, it follows that

$$\Sigma\delta h \cos l_1 i = [\phi(l_1 + l_2)\cos 182\,(l_1 + l_2) + \phi(l_1 - l_2)\cos 182\,(l_1 - l_2)]\,\mathrm{A}_2$$
$$+ [\phi(l_1 + l_2)\sin 182\,(l_1 + l_2) - \phi(l_1 - l_2)\sin 182\,(l_1 - l_2)]\,\mathrm{B}_2 + \&c.$$
$$\Sigma\delta h \sin l_1 i = [\phi(l_1 + l_2)\sin 182\,(l_1 + l_2) + \phi(l_1 - l_2)\sin 182\,(l_1 - l_2)]\,\mathrm{A}_2$$
$$+ [-\phi(l_1 + l_2)\cos 182\,(l_1 + l_2) + \phi(l_1 - l_2)\cos 182\,(l_1 - l_2)]\,\mathrm{B}_2 + \&c.$$

In these equations there is always one pair of terms in which l_2 is identical with l_1, and since $\phi(l_1 - l_1) = 182{\cdot}5$ and as $\cos 182\,(l_1 - l_1) = 1$, it follows that there is one term in each equation, in which there is a coefficient nearly equal to 182·5. In the cosine series, it will be the coefficient of an A and in the sine series, of a B.

The following are the equations with the coefficients inserted, as computed from these formulæ, or their equivalents:—

Final Equations for Tides of Long-period.*

	Co-efficient of A	Co-efficient of B	Co-efficient of C	Co-efficient of D	Co-efficient of C′	Co-efficient of D′	Co-efficient of E	Co-efficient of F	Co-efficient of G	Co-efficient of H
$\Sigma\delta h \times \cos(\sigma-\varpi)t =$	+183·05	+ 2·14	+ 0·72	+ 4·29	+ 0·76	+ 5·04	+ 4·88	− 0·34	+ 4·96	− 0·70
„ $\times \sin(\sigma-\varpi)t =$	+ 2·14	+181·95	− 4·15	+ 1·01	− 4·90	+ 1·06	+ 3·80	+ 0·34	+ 3·88	+ 0·68
„ $\times \cos 2\sigma t =$	+ 0·72	− 4·15	+183·17	+ 0·88	+ 0·56	+ 0·92	− 1·50	− 0·09	− 1·51	− 0·18
„ $\times \sin 2\sigma t =$	+ 4·29	+ 1·01	+ 0·88	+181·83	+ 0·92	− 0·80	+ 3·05	− 0·08	+ 3·06	− 0·17
„ $\times \cos 2(\sigma-\eta)t =$	+ 0·76	− 4·90	+ 0·56	+ 0·92	+183·19	+ 0·97	− 1·68	− 0·11	− 1·70	− 0·21
„ $\times \sin 2(\sigma-\eta)t =$	+ 5·04	+ 1·06	+ 0·92	− 0·80	+ 0·97	+181·81	+ 3·24	− 0·10	+ 3·25	− 0·20
„ $\times \cos \eta t =$	+ 4·88	+ 3·80	− 1·50	+ 3·05	− 1·68	+ 3·24	+182·38	+ 0·00	− 0·24	+ 0·01
„ $\times \sin \eta t =$	− 0·34	+ 0·34	− 0·09	− 0·08	− 0·11	− 0·10	+ 0·00	+182·62	+ 0·00	+ 0·00
„ $\times \cos 2\eta t =$	+ 4·96	+ 3·88	− 1·51	+ 3·06	− 1·70	+ 3·25	− 0·24	+ 0·00	+182·38	+ 0·00
„ $\times \sin 2\eta t =$	− 0·70	+ 0·68	− 0·18	− 0·17	− 0·21	− 0·20	+ 0·01	+ 0·00	+ 0·00	+182·62

If the daily means have been cleared by the use of the tide-predicter as above described, these ten equations are ready for solution, but if not, then before solution of the final equations, corrections for clearance must be applied to the left-hand sides.

8.

Long-period Tides:—Evaluation of Clearances.

Let n be the speed of short-period tide in degrees per mean solar hour, and let $\psi(n) = \dfrac{1}{24}\,\dfrac{\sin 12n}{\sin \frac{1}{2}n}$. Then it has been already shown that the clearance to δh_i, the mean height of water at $11^{\mathrm{h}}\,30^{\mathrm{m}}$ of the $(i+1)^{\mathrm{th}}$ day, will be

$$-\psi(n)\,\mathrm{R}\cos[n\{24i + 11\tfrac{1}{2}\} - \zeta].$$

* The figures here given differ slightly from those given in the computation forms but the difference is immaterial.

If m is put equal to $24n$ (so that m is the daily increase of the argument of the short-period tide) and $\beta = n \times 11\frac{1}{2} - \zeta$, this becomes

$$-\psi(n)\,\mathrm{R}\cos(mi + \beta).$$

Hence the clearance for $\delta h_i \cos li$ is

$$-\tfrac{1}{2}\psi(n)\,\mathrm{R}\{\cos[(m+l)i+\beta] + \cos[(m-l)i+\beta]\},$$

and for $\delta h_i \sin li$ is

$$-\tfrac{1}{2}\psi(n)\,\mathrm{R}\{\sin[(m+l)i+\beta] - \sin[(m-l)i+\beta]\}.$$

Summing the series of 365 terms, the additive clearance for $\Sigma\delta h_i \cos li$ becomes

$$-\mathrm{R}\psi(n)\{\phi(m+l)\cos[182(m+l)+\beta] + \phi(m-l)\cos[182(m-l)+\beta]\},$$

where as before
$$\phi(x) = \tfrac{1}{2}\frac{\sin\frac{365}{2}x}{\sin\frac{1}{2}x}.$$

If Δn denote the increment of the argument nt in $182^{\mathrm{d}}\ 11^{\mathrm{h}}\ 30^{\mathrm{m}}$, this may now be written

$$-\mathrm{R}\psi(n)\{\phi(m+l)\cos[\Delta n + 182l - \zeta] + \phi(m-l)\cos[\Delta n - 182l - \zeta]\}.$$

If therefore $\mathrm{R}\cos\zeta = \mathrm{A}$ and $\mathrm{R}\sin\zeta = \mathrm{B}$, so that A and B are the component semi-ranges of the tide n as immediately deduced from the harmonic analysis for the tides of short-period, the clearance to $\Sigma\delta h_i \cos li$ becomes

$$-[\psi(n)\phi(m+l)\cos(\Delta n+182l) + \psi(n)\phi(m-l)\cos(\Delta n-182l)]\mathrm{A}$$
$$-[\psi(n)\phi(m+l)\sin(\Delta n+182l) + \psi(n)\phi(m-l)\sin(\Delta n-182l)]\mathrm{B}.$$

In precisely the same manner the clearance for $\Sigma\delta h_i \sin li$ is found to be

$$-[\psi(n)\phi(m+l)\sin(\Delta n+182l) - \psi(n)\phi(m-l)\sin(\Delta n-182l)]\mathrm{A}$$
$$+[\psi(n)\phi(m+l)\cos(\Delta n+182l) - \psi(n)\phi(m-l)\cos(\Delta n-182l)]\mathrm{B}.$$

If then
$$\mathrm{K}(n,l) = \phi(m+l) + \phi(m-l),$$
and
$$\mathrm{Z}(n,l) = \phi(m+l) - \phi(m-l);$$
and if
$$\mathrm{C}(n) = \psi(n)\cos\Delta n = \frac{1}{24}\frac{\sin 12n}{\sin\frac{1}{2}n}\cos\Delta n,$$
and
$$\mathrm{S}(n) = \psi(n)\sin\Delta n;$$

and if the additive clearances for $\Sigma\delta h_i \cos li$, and $\Sigma\delta h_i \sin li$, be denoted respectively by

$$[\mathrm{A},n,l,\cos]\,\mathrm{A} + [\mathrm{B},n,l,\cos]\,\mathrm{B},$$
and
$$[\mathrm{A},n,l,\sin]\,\mathrm{A} + [\mathrm{B},n,l,\sin]\,\mathrm{B};$$
then
$$[\mathrm{A},n,l,\cos] = -\mathrm{C}(n)\mathrm{K}(n,l)\cos 182l + \mathrm{S}(n)\mathrm{Z}(n,l)\sin 182l,$$
$$[\mathrm{B},n,l,\cos] = -\mathrm{S}(n)\mathrm{K}(n,l)\cos 182l - \mathrm{C}(n)\mathrm{Z}(n,l)\sin 182l,$$
$$[\mathrm{A},n,l,\sin] = -\mathrm{S}(n)\mathrm{Z}(n,l)\cos 182l - \mathrm{C}(n)\mathrm{K}(n,l)\sin 182l,$$
$$[\mathrm{B},n,l,\sin] = +\mathrm{C}(n)\mathrm{Z}(n,l)\cos 182l - \mathrm{S}(n)\mathrm{K}(n,l)\sin 182l.$$

In the case when l refers to the tide MSf of speed $2(\sigma-\eta)$, and m to the tide M_2 of speed $2(\gamma-\sigma)$, $\frac{1}{2}(m+l) = 360°$, and $\phi(m+l) = 182{\cdot}5$.

The following schedule gives the value of these coefficients for the various tides:—

Schedule of Coefficients for Clearance of Daily Means in the Final Equations.*

		Coefficient	$l = \sigma - \varpi$	$l = 2\sigma$	$l = 2(\sigma - \eta)$	$l = \eta$	$l = 2\eta$
M_2	$n = 2(\gamma - \sigma)$	[A, n, l, cos]	− 0·05557	+ 0·00302	+ 5·7393	− 0·10410	− 0·10465
		[B, n, l, cos]	− 0·17036	− 0·03773	− 2·9228	− 0·07525	− 0·07546
		[A, n, l, sin]	− 0·17075	+ 0·04170	− 2·8400	− 0·00176	− 0·00353
		[B, n, l, sin]	+ 0·04410	+ 0·01052	− 5·7271	+ 0·00476	+ 0·00958
N	$n = 2\gamma - 3\sigma + \varpi$	[A, n, l, cos]	− 0·05884	+ 0·03680	+ 0·02938	− 0·01760	− 0·01760
		[B, n, l, cos]	− 0·07758	− 0·22357	− 0·19384	+ 0·00254	+ 0·00254
		[A, n, l, sin]	− 0·02059	− 0·15257	− 0·12210	+ 0·00020	+ 0·00041
		[B, n, l, sin]	+ 0·11381	− 0·08544	− 0·08081	+ 0·00007	+ 0·00015
O	$n = \gamma - 2\sigma$	[A, n, l, cos]	− 0·06485	+ 0·01662	+ 0·01571	− 0·19240	− 0·19340
		[B, n, l, cos]	− 0·34765	− 0·07775	− 0·08158	− 0·18260	− 0·18311
		[A, n, l, sin]	− 0·34523	+ 0·08411	+ 0·08754	− 0·00460	− 0·00926
		[B, n, l, sin]	+ 0·04052	+ 0·03384	+ 0·03306	+ 0·00897	+ 0·01802

9.

Long-period Tides:—Solution of Equations.

As the determination of each of the ten quantities $\Sigma\delta h \cos(\sigma - \varpi)t$, $\Sigma\delta h \sin(\sigma - \varpi)t$, &c., by multiplying each of the 365 δh's by its proper cosine or sine and adding the results together, would be extremely laborious, the method of equivalent multipliers was devised by the late Professor Adams. The values of the respective cosines and sines are divided into eleven groups according as they fall nearest to 1·0, ·9, ·8 . . . . ·2, ·1, 0. Then as each of the values of δh is to be multiplied by some value of the cosine or sine, and as this value must fall into one of the groups, all the values of δh which belong to one of these groups are collected together, summed, and the sum multiplied by the corresponding value of the cosine or sine. Also since there are as many positive as negative values of the cosine or sine, the signs of half the δh's must be changed. This is effected mechanically as follows:—in the spaces in the forms for the entry of δh's those δh's in which the signs are to be unchanged are entered on the left hand side of the space, if positive, and on the right, if negative. Thus in the column corresponding to each multiplier there are two sub-columns: these are separately summed, and the difference of these sums gives the total of the column for the δh's whose signs are to be unchanged. This process is carried out in the upper half of the form and the result is called a. Exactly the same process is carried out in the lower half of the form with the δh's in which the signs are to be changed,

* The figures here differ slightly from those used in the computation forms but the difference is immaterial.

and the result is denoted by b. The complete sum of the δh's is thus $a - b$, and the value of $a - b$ in each column is multiplied by the multiplier corresponding to that column, the sum of the products giving the result required. A pair of forms, one for the cosine and the other for the sine series, is required for each long-period tide.

The ten equations are to be solved by successive approximation, the results being the component semi-amplitudes A, B, &c., of the five long-period tides. But the initial instant of time is the first $11^h\ 30^m$ in the year, instead of the first noon: hence, if, as before, $R^2 = A^2 + B^2$ and $\tan \zeta_1 = \frac{B}{A}$, then, in order to reduce the results to the normal form in which the noon of the first day is the initial instant of time, the increment of the corresponding argument for $11^h\ 30^m$ must be added to ζ_1.

10.

Long-period Tides:—Breaks in the Record.

It may happen from time to time, that the tide-gauge breaks down for a few days, from the stoppage of the clock, the choking of the tube, or some other accident, and that other readings are not taken during the interruption. In this case there will be a hiatus in the values of δh. Now the whole process employed depends on the existence of 365 continuous values of δh. Unless, therefore, the year's observations are to be sacrificed, this hiatus must be filled. If not more than three or four days' observations are wanting, it is best to plot out the values of δh graphically on each side of the hiatus and, filling in the gap with a curve drawn by hand, to use the values of δh given by the conjectural curve. The tide-table predictions are invariably utilised in this process when available.

If the gap is somewhat longer, several plans might be adopted, for example, if there is another station in the neighbourhood, the values of δh for that station might be inserted; or, the values of δh for another part of the year, in which the moon's and sun's declinations are as nearly as possible the same as they were during the gap, might be used, and, as a matter of fact, these methods have been employed.

When the hiatus is of considerable length, the preceding methods are inapplicable, and the method employed is as follows:—The actual δh's are entered in their proper places and in the ten final equations all the terms with small coefficients are neglected, and in the terms whose coefficients are approximately 182·5, a coefficient equal to 182·5 diminished by half the number of days of the hiatus, is substituted: the computations are then carried out as if there was no gap, until the values of R and ζ are obtained for each long-period tide. From these approximate values of R and ζ, the height of each tide for each day of the gap is computed by the formula $R \cos (nt - \zeta)$, where t is the number of days since the commencement of the year of observation and n is the speed of the particular long-period tide in degrees per mean solar day. Thus five heights, above or below mean water level, are obtained for each day of the gap. These five heights are added together and the sum is the missing δh for the particular day. The gap having been thus filled in with computed δh's, the whole computation is repeated with the completed series of δh's.

When a break extends over two or three months in the first half of the working year, the observations antecedent to the break in that half-year are rejected, and the date of the working year put forward to the date following the end of the break: but if the break occurs in the second half of the working year, that year is considered to end at the commencement of the break and to begin 365 days before it; and the year following the break will begin at the end of the break.

FORMS FOR SHORT-PERIOD TIDES.

Bombay—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - \eta)$. Series S. Motion per mean Solar hour = 15°.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Daily Sum	Daily Mean
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	247·92	10·330
2	16·66	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	247·94	10·331
3	16·63	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	253·58	10·566
4	14·87	16·40	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	255·05	10·627
5	12·28	14·51	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	258·98	10·791
6	9·67	12·12	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	262·98	10·958
7	7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	265·10	11·046
8	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	263·23	10·968
9	7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	255·79	10·658
10	7·14	6·75	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	253·25	10·552
11	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	251·49	10·479
12	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	252·91	10·538
13	10·23	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	252·67	10·528
14	11·80	9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	252·56	10·523
15	13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	247·85	10·327
16	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	245·67	10·236
17	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	247·25	10·302
18	14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	246·84	10·285
19	14·06	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	242·28	10·095
20	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	244·36	10·182
21	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	249·03	10·376
22	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	253·59	10·566
23	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	256·64	10·693
24	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	256·53	10·689
25	6·08	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	255·73	10·655
26	5·83	5·38	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	252·88	10·537
27	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	249·40	10·392
28	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	245·29	10·220
29	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	244·25	10·177
30	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	244·78	10·199
31	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	246·38	10·266
32	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	245·46	10·228
33	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	251·17	10·465
34	13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	255·13	10·630
35	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	257·26	10·719

36	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11	11·12	9·30	7·54	6·26	6·13	6·68	254·53	10·605
37	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	248·50	10·354
38	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	244·59	10·191
39	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76	9·97	9·00	8·00	242·79	10·116
40	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	240·19	10·008
41	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	10·36	238·54	9·939
42	8·82	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	236·90	9·871
43	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	242·61	10·109
44	12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	242·99	10·125
45	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	14·56	239·20	9·967
46	14·85	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	240·74	10·031
47	15·50	15·15	13·08	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	241·46	10·061
48	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	237·18	9·883
49	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	238·79	9·950
50	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	243·80	10·158
51	10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06	6·46	245·64	10·235
52	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92	5·44	243·60	10·150
53	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98	5·77	5·38	240·66	10·028
54	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	7·32	5·96	238·35	9·931
55	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	12·26	11·27	9·76	7·96	236·30	9·846
56	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	12·60	10·86	240·25	10·010
57	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	13·76	242·57	10·107
58	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	240·63	10·026
59	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	237·84	9·910
60	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	238·20	9·925
61	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	237·28	9·887
62	15·97	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	242·32	10·097
63	14·34	16·02	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	243·69	10·154
64	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	245·55	10·231
65	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	249·30	10·388
66	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	252·05	10·502
67	8·54	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	255·55	10·648
68	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98	253·85	10·577
69	7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	248·72	10·363
70	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	247·99	10·333
71	8·84	7·56	6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	246·87	10·286
72	9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	242·04	10·085
73	11·46	9·42	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	241·51	10·063
74	13·37	11·16	8·45	6·26	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	239·23	9·968
Sum	814·09	807·47	768·68	713·90	656·10	612·63	601·16	628·55	691·30	776·04	866·90	936·49	975·00	976·40	939·65	873·58	794·64	719·55	662·98	634·76	641·91	681·53	734·50	786·21	18294·02	

FORMS FOR SHORT-PERIOD TIDES.

SERIES S.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Daily Sum	Daily Mean
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
75	15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	234·57	9·774
76	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	238·69	9·945
77	16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	240·53	10·022
78	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	244·50	10·188
79	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	247·71	10·321
80	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	251·80	10·492
81	9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	260·22	10·843
82	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	259·96	10·832
83	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67	8·30	7·06	260·46	10·853
84	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26	12·36	12·92	12·78	11·94	10·50	8·78	254·97	10·624
85	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	11·72	251·52	10·480
86	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	249·75	10·406
87	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	248·98	10·374
88	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	248·54	10·356
89	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	252·79	10·533
90	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	252·73	10·530
91	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	251·83	10·493
92	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	253·06	10·544
93	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	255·20	10·633
94	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	258·68	10·778
95	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	256·01	10·667
96	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	252·79	10·533
97	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	249·65	10·402
98	7·98	8·76	9·87	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	251·07	10·461
99	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	252·17	10·507
100	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	254·21	10·592
101	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	253·83	10·576
102	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	249·60	10·400
103	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36	16·20	244·43	10·185
104	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	239·14	9·964
105	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97	15·58	237·49	9·895
106	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	240·38	10·016
107	16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	246·14	10·256
108	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67	9·40	246·76	10·282
109	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·33	9·92	7·24	5·36	4·17	4·16	5·20	7·26	250·28	10·428

110	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60	5·96	4·93	5·02	5·86	247·00	10·292
111	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	248·49	10·354
112	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	250·32	10·430
113	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	250·88	10·453
114	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	13·72	13·87	12·97	11·36	247·23	10·301
115	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86	244·52	10·188
116	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	15·54	240·36	10·015
117	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14	16·26	239·70	9·988
118	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	240·64	10·027
119	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	238·27	9·928
120	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	240·82	10·034
121	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	237·58	9·899
122	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	238·91	9·955
123	12·80	14·56	15·43	14·76	13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	241·48	10·062
124	11·42	13·34	14·60	14·86	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	244·23	10·176
125	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	245·52	10·230
126	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	247·28	10·303
127	8·66	9·74	10·97	12·22	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	249·67	10·403
128	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	247·40	10·308
129	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	250·44	10·435
130	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	12·12	13·50	14·22	13·67	12·20	249·46	10·394
131	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	247·65	10·319
132	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	244·83	10·201
133	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	240·61	10·025
134	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	236·39	9·850
135	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	234·56	9·773
136	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	235·02	9·793
137	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	240·09	10·004
138	12.92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	246·49	10·270
139	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	248·31	10·346
140	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	248·99	10·375
141	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	245·71	10·238
142	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	239·63	9·985
143	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	238·73	9·947
144	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	241·20	10·050
145	11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	242·92	10·122
146	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	240·46	10·019
147	14·67	12·94	10·67	8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	241·53	10·064
148	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	243·57	10·149
Sum	885·27	889·48	864·56	818·97	767·77	731·08	714·25	726·49	762·13	811·55	860·03	891·16	889·23	848·64	777·93	694·49	619·85	569·27	555·03	578·32	633·64	709·45	788·20	850·54	18237·33	

FORMS FOR SHORT-PERIOD TIDES.

Series S.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Daily Sum	Daily Mean
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
149	16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66	245·21	10·217
150	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00	13·46	246·34	10·264
151	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	248·44	10·352
152	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	248·50	10·354
153	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	248·03	10·335
154	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	250·52	10·438
155	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	254·73	10·614
156	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32	8·36	258·37	10·765
157	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23	263·32	10·972
158	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	269·32	11·222
159	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28	13·22	14·76	15·82	15·76	14·97	13·34	290·03	12·085
160	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	16·85	15·70	293·64	12·235
161	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	279·46	11·644
162	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	17·95	265·69	11·070
163	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	255·38	10·641
164	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	251·17	10·465
165	18·12	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	250·06	10·419
166	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	16·05	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	248·24	10·343
167	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07	13·02	14·92	15·57	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	253·50	10·563
168	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	257·70	10·738
169	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86	6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	261·22	10·884
170	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	260·09	10·837
171	8·49	9·03	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60	259·17	10·799
172	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46	11·06	258·99	10·791
173	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	14·17	12·86	257·31	10·721
174	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	249·43	10·393
175	12·40	10·90	9·46	8·62	8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	243·58	10·149
176	13·77	12·06	10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56	15·33	238·17	9·924
177	14·70	13·32	11·14	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	235·13	9·797
178	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	7·84	10·40	12·82	14·74	236·71	9·863
179	15·56	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	234·25	9·760
180	15·12	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	232·29	9·679
181	14·31	15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	11·17	233·28	9·720
182	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07	10·12	232·60	9·692
183	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	9·24	237·53	9·897

184	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56	8·50	242·76	10·115
185	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	243·34	10·139
186	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	243·60	10·150
187	8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	241·12	10·047
188	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	243·89	10·162
189	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	243·34	10·139
190	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	238·60	9·942
191	12·92	10·40	8·23	7·07	6·90	7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	235·34	9·806
192	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	15·05	14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	233·39	9·725
193	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	233·17	9·715
194	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	236·04	9·835
195	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	238·84	9·952
196	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	246·63	10·276
197	13·00	15·56	17·04	17·17	15·44	12·60	9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	251·45	10·477
198	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	251·54	10·481
199	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	253·94	10·581
200	8·86	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	250·39	10·433
201	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	252·51	10·521
202	10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	255·49	10·645
203	11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	253·89	10·579
204	12·08	10·74	9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	251·04	10·460
205	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	251·04	10·460
206	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	250·98	10·458
207	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	251·13	10·464
208	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	247·80	10·325
209	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	249·10	10·379
210	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	244·98	10·208
211	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76	247·03	10·293
212	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	246·43	10·268
213	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	249·74	10·406
214	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	250·04	10·418
215	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	252·17	10·507
216	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	258·66	10·778
217	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	256·85	10·702
218	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	258·03	10·751
219	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	260·82	10·868
220	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	254·83	10·618
221	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	15·72	13·66	10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	18·37	253·83	10·576
222	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	16·38	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	252·94	10·539
Sum	943·28	948·07	928·91	889·06	838·11	788·76	748·57	726·62	726·18	746·27	773·80	793·58	793·05	769·34	722·70	666·49	620·53	596·14	604·10	640·99	705·26	783·60	857·11	913·59	18524·11	

FORMS FOR SHORT-PERIOD TIDES.

Series S.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Daily Sum	Daily Mean
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
223	18.50	17.76	14.76	10.60	7.27	5.06	4.48	5.07	7.18	10.36	13.94	16.34	17.16	16.04	13.12	9.20	5.80	3.36	2.56	3.60	5.73	9.03	12.78	15.94	245.64	10.235
224	17.78	18.04	16.74	13.32	9.36	6.05	4.18	3.80	4.90	7.56	11.10	14.46	16.66	16.88	15.39	12.15	8.23	5.44	3.52	3.32	4.58	7.04	10.14	13.35	243.99	10.166
225	16.16	17.52	17.26	15.28	11.80	8.22	5.32	3.80	4.02	5.58	8.40	11.50	14.52	16.18	16.06	14.38	11.26	7.98	5.62	4.54	4.80	6.25	8.27	11.00	245.72	10.238
226	13.96	16.32	17.26	16.42	14.32	10.85	7.62	5.16	4.10	4.64	6.45	8.92	12.0[illegible]	14.70	15.80	15.18	13.36	10.62	7.94	6.32	5.74	6.44	7.77	9.72	251.66	10.486
227	12.07	14.12	15.66	15.72	14.46	12.06	9.36	6.96	5.40	5.07	5.84	7.33	9.54	11.87	13.60	14.46	13.96	12.48	10.40	8.65	7.45	7.28	8.00	9.26	251.00	10.458
228	10.72	12.27	13.74	14.47	14.18	12.78	10.82	8.78	6.78	5.83	5.86	6.74	8.34	10.14	12.02	13.26	13.57	12.85	11.76	10.70	9.74	9.12	8.90	9.34	252.71	10.530
229	10.06	10.94	12.10	12.88	13.72	13.38	11.88	10.06	8.17	7.02	6.68	7.00	7.70	8.77	10.10	11.44	12.33	12.66	12.46	12.00	11.36	10.62	10.07	9.67	253.07	10.545
230	9.77	10.12	10.82	11.54	12.43	12.67	12.12	11.23	9.96	8.64	7.77	7.46	7.69	8.30	9.04	10.10	11.17	12.34	12.90	12.90	12.34	11.72	11.15	10.62	254.80	10.617
231	10.30	10.00	10.14	10.50	11.34	11.96	12.26	11.97	11.38	10.53	9.44	8.35	7.66	7.57	8.12	9.06	10.48	11.57	12.72	13.42	13.56	13.18	12.30	11.45	259.26	10.803
232	10.72	10.26	9.92	9.63	10.00	10.71	11.62	12.32	12.18	11.42	10.36	9.08	8.15	7.53	7.24	7.70	8.54	9.82	11.43	12.72	13.64	13.66	13.26	12.36	254.27	10.595
233	11.22	10.18	9.34	8.97	9.08	9.88	10.76	11.64	12.26	12.35	11.85	10.40	8.78	7.36	6.44	6.28	7.14	8.37	10.20	11.94	13.38	14.40	14.54	13.58	250.34	10.431
234	12.17	10.70	9.34	8.82	8.84	9.26	10.00	11.16	12.50	13.30	13.42	12.06	10.16	8.40	6.86	6.06	6.14	7.20	8.95	10.80	12.76	13.96	14.91	14.84	252.61	10.525
235	13.64	11.84	9.97	8.77	8.36	8.48	8.96	10.06	11.56	13.12	13.97	13.64	12.06	9.70	7.27	5.96	5.56	6.35	7.80	9.76	11.70	13.66	15.10	15.46	252.75	10.531
236	14.62	12.86	10.57	8.64	7.46	7.31	7.76	8.84	10.72	12.64	14.21	14.62	13.44	11.00	8.24	6.24	5.17	5.36	6.54	8.54	10.66	13.00	15.02	15.96	249.42	10.393
237	15.50	14.08	11.60	8.97	7.34	6.70	6.84	7.80	9.62	11.70	13.76	14.95	14.67	12.76	10.00	7.37	5.56	4.97	5.74	7.38	9.36	11.94	14.36	16.04	249.01	10.375
238	16.27	15.32	13.08	10.11	7.72	6.36	6.10	6.94	8.63	10.83	13.20	15.21	15.71	14.43	11.89	8.54	6.26	4.97	5.06	6.36	8.22	10.64	13.40	15.80	251.05	10.460
239	16.62	16.16	14.21	11.38	8.34	6.35	5.46	5.74	7.13	9.22	11.84	14.36	15.71	15.48	13.64	10.66	7.60	5.70	4.96	5.70	7.24	9.54	12.02	14.56	249.62	10.401
240	16.24	16.56	15.34	12.80	9.60	7.06	5.50	5.18	5.94	7.72	10.28	13.04	15.14	15.90	14.88	12.52	9.63	7.07	5.74	5.64	6.67	8.36	10.62	13.17	250.60	10.442
241	15.30	16.38	15.97	14.06	11.04	8.16	6.11	5.05	5.41	6.72	8.83	11.26	13.77	15.36	15.38	14.00	11.50	8.72	6.86	5.97	6.34	7.52	9.30	11.47	250.48	10.437
242	13.80	15.46	15.84	14.77	12.44	9.37	7.06	5.37	4.85	5.64	7.12	9.24	11.64	13.96	15.06	14.75	13.17	10.76	8.64	7.30	6.86	7.44	8.64	10.38	249.56	10.398
243	12.36	14.06	15.24	15.10	13.64	11.26	8.61	6.50	5.32	5.38	6.34	7.85	9.86	11.96	13.64	14.58	14.07	12.68	10.68	8.97	8.02	7.81	8.36	9.26	251.55	10.481
244	10.60	12.24	13.73	14.44	13.86	12.25	10.02	8.06	6.46	5.62	5.78	6.47	7.80	9.63	11.38	12.97	13.74	13.44	12.44	11.04	9.83	8.84	8.57	8.87	248.08	10.337
245	9.67	10.67	11.96	13.06	13.46	13.08	11.68	9.86	8.26	6.87	6.17	6.26	7.02	8.17	9.66	11.26	12.55	13.37	13.57	12.94	11.92	10.73	9.67	9.16	251.02	10.459
246	9.18	9.63	10.54	11.48	12.46	12.92	12.66	11.74	10.42	8.87	7.44	6.44	6.21	6.66	7.76	9.20	10.76	12.36	13.54	14.05	13.67	12.68	11.26	10.02	251.95	10.498
247	9.22	8.90	9.14	9.86	10.86	12.02	12.84	12.98	12.36	11.16	9.57	7.60	6.24	5.63	5.97	7.17	8.80	10.66	12.80	14.28	14.96	14.74	13.66	11.85	253.27	10.553
248	10.04	8.66	8.02	8.14	9.04	10.38	12.00	13.14	13.74	13.40	12.04	10.04	7.64	5.76	4.78	5.02	6.24	8.16	10.78	13.20	15.04	15.98	15.74	14.33	251.31	10.471
249	11.96	9.30	7.37	6.55	6.70	8.06	9.98	12.06	13.93	14.86	14.44	12.80	10.18	7.37	5.17	3.90	4.03	5.50	7.96	10.88	13.80	16.04	17.04	16.46	246.34	10.264
250	14.44	11.04	8.24	6.27	5.15	5.63	7.24	9.64	12.52	14.74	15.98	15.46	13.29	9.94	6.63	4.34	3.17	2.53	5.38	8.20	11.40	14.56	16.82	17.44	240.05	10.002
251	16.36	13.83	9.98	6.70	4.46	3.84	4.58	6.80	10.06	13.28	15.76	16.64	15.75	12.94	9.26	6.06	3.66	2.67	3.72	5.66	8.70	12.20	15.53	17.33	235.77	9.824
252	17.53	15.87	12.42	8.56	5.32	3.44	3.17	4.55	7.26	10.87	14.22	16.50	17.05	15.47	12.37	8.44	5.52	3.48	3.10	4.46	6.74	9.94	13.47	16.22	235.97	9.832
253	17.47	17.02	14.77	10.84	7.23	4.52	3.00	3.30	5.07	8.06	11.72	14.94	16.86	16.90	14.94	11.54	8.00	5.38	3.90	4.20	5.52	7.95	11.06	14.30	238.49	9.937
254	16.51	17.04	15.88	12.99	9.17	5.97	3.70	2.94	3.94	6.16	9.14	12.45	15.42	16.68	16.10	13.81	10.56	7.46	5.47	4.87	5.60	7.04	9.54	12.25	240.69	10.029
255	14.81	16.16	16.06	14.44	11.07	7.87	5.34	3.84	3.92	5.16	7.43	10.36	13.44	15.47	16.04	14.92	12.66	9.98	7.74	6.47	6.36	7.02	8.54	10.58	245.68	10.237
256	12.80	14.58	15.36	14.73	12.52	9.86	7.17	5.31	4.44	5.02	6.44	8.50	11.04	13.56	14.79	14.77	13.46	11.46	9.44	8.00	7.36	7.56	8.36	9.51	246.04	10.252
257	11.10	12.60	13.73	13.94	12.90	11.02	8.73	6.90	5.70	5.63	6.34	7.60	9.36	11.36	13.14	13.88	13.60	12.43	10.94	9.64	8.76	8.44	8.70	9.18	245.63	10.234

258	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	241·49	10·062
259	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	239·91	9·996
260	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	240·69	10·029
261	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	243·05	10·127
262	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	241·25	10·052
263	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	242·16	10·090
264	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	237·22	9·884
265	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	238·66	9·944
266	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	241·36	10·057
267	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	240·52	10·022
268	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	242·11	10·088
269	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	241·56	10·065
270	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	243·01	10·125
271	14·26	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	243·47	10·145
272	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87	7·56	7·92	8·94	243·54	10·148
273	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	8·56	246·16	10·257
274	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	248·91	10·371
275	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	252·43	10·518
276	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	251·58	10·483
277	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	258·51	10·771
278	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	258·60	10·775
279	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15	257·68	10·737
280	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40	252·44	10·518
281	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	253·35	10·556
282	17·12	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	251·22	10·468
283	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	248·60	10·358
284	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	243·79	10·158
285	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	244·96	10·207
286	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	245·15	10·215
287	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	241·51	10·063
288	9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	242·38	10·099
289	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	242·08	10·087
290	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	244·81	10·200
291	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	246·11	10·255
292	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	247·68	10·320
293	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	249·02	10·376
294	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	245·82	10·243
295	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	248·75	10·365
296	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16	11·00	8.32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	247·70	10·321
Sum	937·59	911·22	852·77	773·80	692·27	628·64	595·34	600·56	643·42	708·54	779·87	831·26	854·14	845·43	805·24	749·88	695·89	659·99	659·79	691·62	747·19	815·87	881·94	926·37	18288·63	

FORMS FOR SHORT-PERIOD TIDES.

Series S.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Daily Sum	Daily Mean
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
297	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	247·49	10·312
298	16·22	14·81	11·87	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	248·55	10·356
299	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68	245·17	10·215
300	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	11·56	246·08	10·253
301	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	250·93	10·455
302	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	7·92	251·48	10·478
303	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	252·30	10·513
304	7·84	8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	251·09	10·462
305	7·22	7·02	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	250·52	10·438
306	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	250·93	10·455
307	9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	249·96	10·415
308	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	246·08	10·253
309	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	15·52	15·84	245·40	10·225
310	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	245·23	10·218
311	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	242·78	10·116
312	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	240·71	10·030
313	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	241·83	10·076
314	13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68	245·57	10·232
315	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	246·68	10·278
316	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	247·03	10·293
317	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72	10·53	9·66	9·14	8·92	8·96	247·65	10·319
318	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	249·42	10·393
319	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88	252·54	10·523
320	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	251·42	10·476
321	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	13·00	11·72	10·14	250·46	10·436
322	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	13·94	13·04	11·34	248·30	10·346
323	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87	245·11	10·213
324	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	14·20	237·83	9·910
325	12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	233·40	9·725
326	13·97	11·41	8·07	4·96	2·57	1·63	2.58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	228·11	9·505
327	15·17	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	231·00	9·625
328	15·50	14·80	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	231·96	9·665
329	14·67	15·26	14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	233·39	9·725
330	12·77	14·29	14·72	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	236·34	9·848
331	10·30	12·38	13·76	13·96	12·68	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	242·56	10·107

332	8·04	10·04	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	244·22	10·176
333	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	248·32	10·347
334	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	250·95	10·456
335	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	251·42	10·476
336	7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	248·19	10·341
337	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	248·42	10·351
338	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56	248·42	10·351
339	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	247·53	10·314
340	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	249·57	10·399
341	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	250·21	10·425
342	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	249·08	10·378
343	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	251·20	10·467
344	13·03	13·80	13·45	11·78	9·47	7·26	5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	249·14	10·381
345	11·60	12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	243·64	10·152
346	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	243·62	10·151
347	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	252·05	10·502
348	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	254·38	10·599
349	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	254·86	10·619
350	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	8·36	253·08	10·545
351	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	249·04	10·377
352	7·18	5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	241·72	10·072
353	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	13·00	242·66	10·111
354	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	15·14	15·03	245·69	10·237
355	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	242·65	10·110
356	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	239·31	9·971
357	16·17	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	238·83	9·951
358	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	234·83	9·785
359	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	239·38	9·974
360	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	242·74	10·114
361	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	244·25	10·177
362	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	243·30	10·138
363	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	8·24	8·54	9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	243·57	10·149
364	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	8·58	8·66	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	243·29	10·137
365	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	10·28	9·14	8·62	8·63	9·20	10·44	11·66	12·53	12·92	12·58	11·64	9·77	243·24	10·135
366	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	239·49	...
367	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	13·16	243·46	...
368	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	13·46	13·82	244·44	...
369	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	243·31	...
370	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35·61	...
Sum	814·95	774·00	708·99	629·27	572·10	540·36	545·06	587·93	658·53	742·96	822·19	880·63	912·48	915·78	892·52	849·63	799·14	754·68	726·45	720·34	734·38	761·88	791·71	808·45	17944·41	

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - \sigma)$. SERIES M. Motion per mean Solar hour = 14°·4920521.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour	
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d	h
1	15·53	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14 11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	16·66	2	0
2	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16 6·10	8·63	11·84	14·68	16·63	16·96	3	1
3	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	14·87	16·40 16·40	4	2
4	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	12·28	14·51	15·96	5	2
5	15·58	13·48	10·47	7·54 5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67	12·12	14·04	15·00	6	3
6	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60 12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76	11·80	13·27	14·00	7	4
7	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18 13·87	11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	11·16	12·55	13·24	8	5
8	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24 7·06	7·34	8·07	9·14	10·55	11·74	12·48	9	6
9	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	8·96 10·26	11·64	12·67	10	7
10	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	11	7
11	13·23	13·84	13·63 12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	12	8
12	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14 9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10	13	9
13	15·20	15·17	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96 13·64	13·36	11·80	9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	14	10
14	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	10·84	8·24	6·20 4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15	11
15	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44 11·24	14·04	15·74	16·36	16	12
16	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	17	12
17	16·63	15·27 12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	18	13
18	16·08	14·04	11·02	8·54	6·76	6·12 6·34	7·60	9·84	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	19	14
19	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28 14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	20	15
20	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91 6·34	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	21	16
21	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	10·80 12·97	14·62	15·50	15·17	13·80	22	17
22	11·46	9·14	7·34	6·17	6·00	6·68	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37 12·76	23	18
23	10·76	8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	24	18
24	12·06	10·26	8·46	7·10	6·25 6·08	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	25	19
25	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78	8·55 10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	26	20
26	12·40	10·74	8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33 13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	27	21
27	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24 6·86	7·53	9·20	11·11	12·97	14·55	15·08	28	22
28	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92 15·74	16·28	29	23
29	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	30	23
30	16·84	15·28	11·68 7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	32	0
31	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86 7·74	11·40	14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	33	1
32	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94 16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43	34	2
33	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34 4·92	4·74	5·86	8·26	11·07	13·60	15·16	15·34	35	3
34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·56 13·26	14·34	14·26	36	4
35	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11	11·12	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	37	4

36	12·94	11·93 10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	38	5
37	11·92	11·42	10·84	10·34	10·07	9·97	9·77 9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	39	6
38	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27 11·45	11·25	10·76	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	40	7
39	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07 7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	41	8
40	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82 6·94	8·54	10·36	12·06	13·46	42	9
41	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	43	9
42	14·67 14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	44	10
43	15·64	15·23	13·64	11·13	9·02 7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	45	11
44	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85 13·07	14·56	14·85	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	46	12
45	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50	15·15	13·08 9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	47	13
46	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52 7·84	10·68	13·68	15·84	16·68	15·86	48	14
47	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26 16·26	14·64	49	15
48	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	50	15
49	13·18	10·24	7·54	5·62 4·54	4·69	5·80	7·87	10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	51	16
50	11·86	9·24	6·90	5·18	4·58	5·06	6·46	8·24	10·33 12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	52	17
51	10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76 11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	53	18
52	10·25	8·57	6·98	5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44 8·48	9·27	10·44	11·57	12·34	12·34	11·70	54	19
53	10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87 11·93	12·44	12·26	55	20
54	11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	56	20
55	13·52	12·60	10·86 8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	57	21
56	14·74	13·76	11·70	8·84	6·08	4·05	3·42 4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	58	22
57	15·86	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04 17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	59	23
58	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20 6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	61	0
59	16·36	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10 10·34	13·76	15·97	16·76	62	1
60	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02	63	1
61	16·28 14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	15·64	64	2
62	15·33	13·25	10·46	8·22	6·76	6·34 7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	65	3
63	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96 14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	13·74	66	4
64	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86 7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	12·88	12·88	67	5
65	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50 9·00	9·78	10·74	11·76	12·46	12·67	68	6
66	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08 12·36	69	7
67	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46	70	7
68	13·04	13·10	12·54	11·68 10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	6·74	6·70	7·63	8·94	10·62	12·06	13·26	71	8
69	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46 9·64	10·86	12·06	12·78	12·56	11·57	9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	72	9
70	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03 11·46	9·42	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	73	10
71	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16 5·12	6·24	8·10	10·63	13·22	15·15	15·86	74	11
Sum	1020·87	900·44	752·96	600·02	497·60	465·12	502·71	600·78	765·87	901·35	1016·37	1068·59	1045·66	921·58	748·92	586·33	476·86	459·09	492·81	595·88	744·51	912·16	1021·90	1075·13	No. of Days. 73ᵈ 12ʰ.	
No.	73	73	74	74	73	73	73	73	75	73	73	73	74	74	74	73	73	75	74	73	73	74	73	74	18173·51	

SERIES M.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
72	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34 16·00	16·06	75 12
73	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73	76 12
74	16·07	13·66	10·42 7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	77 13
75	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60 9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	78 14
76	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74 15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	79 15
77	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96 7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	80 16
78	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40 13·77	14·52	14·20	12·80	81 17
79	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	82 17
80	12·06	10·56 8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	83 18
81	12·44	11·22	9·67	8·30	7·06	6·48 6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26	12·36	12·92	84 19
82	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20 13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	85 20
83	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64 12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	86 21
84	15·36	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80 6·40	9·20	12·06	14·62	16·12	87 22
85	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64 17·04	88 23
86	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	89 23
87	17·34	16·56	14·28	10·82	7·84 5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	91 0
88	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26 12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	92 1
89	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94 9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	93 2
90	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16 7·85	9·97	12·30	14·30	15·48	15·46	94 3
91	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05 14·67	14·27	95 4
92	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	96 4
93	13·26	12·13	10·96	10·04 9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	97 5
94	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02 10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	12·66	98 6
95	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02 10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	99 7
96	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	8·46 7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	100 8
97	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08 12·70	14·06	14·56	101 9
98	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	102 9
99	15·12	14·21 12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	103 10
100	15·49	13·80	11·08	8·22	5·93	4·52	4·32 5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	104 11
101	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40 16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97	16·08	105 12
102	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36 6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	106 13
103	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36 11·33	14·12	15·97	16·50	15·10	107 14
104	12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	108 14
105	13·66 10·74	7·44	4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	109 15
106	12·53	9·92	7·24	5·36	4·17 4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	110 16

107	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00 13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	111 17
108	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26 10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	112 18
109	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96 6·96	7·85	9·40	10·96	12·36	13·06	113 19
110	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64 13·72	114 20
111	13·87	12·97	11·36	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	115 20
112	14·66	14·94	13·86	11·70 9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	116 21
113	15·57	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48 9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14	117 22
114	16·26	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66 14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	118 23
115	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44 3·36	4·67	6·96	9·52	12·56	14·92	16·36	120 0
116	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68 13·46	15·48	16·25	121 1
117	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	15·56	122 1
118	15·54	14·30	11·86 9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	123 2
119	14·76	13·04	10·84	8·96	7·76	7·44	7·76 8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	124 3
120	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46 11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	125 4
121	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	6·96 6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	126 5
122	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97 12·22	13·24	13·54	13·24	127 6
123	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	128 6
124	12·94 12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	129 7
125	13·18	12·36	11·16	9·68	8·30	7·26 6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	130 8
126	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20 12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	131 9
127	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38 10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	132 10
128	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92 10·02	12·44	14·46	15·64	15·47	133 11
129	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97 15·24	134 12
130	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	135 12
131	14·62	11·54	7·86	4·52	2·14 1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	136 13
132	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58 12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	137 14
133	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40 12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	138 15
134	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54	6·48 6·38	7·36	9·30	11·76	13·38	13·98	13·42	139 16
135	11·66	9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30 13·13	12·92	140 17
136	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	141 17
137	12·53	12·07	10·86 9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	142 18
138	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70 8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	143 19
139	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14 14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	144 20
140	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84 5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	145 21
141	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16 8·40	11·03	13·46	15·10	146 22
142	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	147 22
143	15·74	15·70 14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	148 23
Sum	1024·63	914·06	744·98	586·08	476·79	447·90	489·12	604·61	755·24	907·73	1036·36	1107·56	1058·74	937·98	779·46	599·48	499·89	451·76	494·27	610·92	770·90	916·80	1048·80	1093·78	No. of Days. 74^d 12^h
No.	74	75	75	74	75	74	74	75	75	74	74	75	74	74	75	74	75	74	74	75	75	74	75	75	18357·84

SERIES M.—(*Continued*).

Day	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
144	16·13	15·62	13·90	11·47	9·28	7·84 7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	150 0
145	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	11·55	13·36 14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00	13·46	15·32	16·07	151 1
146	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66	14·02	12·96	10·86	8·34 6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30	15·60	152 2
147	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64 10·66	12·74	14·30	15·12	15·06	153 3
148	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	154 3
149	14·22 12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	155 4
150	13·77	12·16	10·50	9·20	8·47 8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	156 5
151	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93 11·70	11·97	11·72	11·06	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	157 6
152	12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	11·84 11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	158 7
153	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17 11·38	12·77	13·98	14·67	15·14	14·88	159 8
154	13·86	12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28	13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30 15·65	15·48	160 9
155	14·17	12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	161 9
156	15·22	13·50	10·84	8·22 6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	162 10
157	15·33	12·77	9·46	6·32	4·44	3·62	4·30	6·30 8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	163 11
158	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53 17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14	164 12
159	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55 6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96	165 13
160	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80 15·12	16·05	15·26	166 14
161	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07	13·02	14·92	15·57	167 14
162	14·68	12·28 9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85	168 15
163	14·05	11·96	9·47	7·26	6·06	5·80	6·39 7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86	6·32	6·58	7·80	9·82	12·04	13·55	14·17	169 16
164	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20 15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	170 17
165	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10 8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	171 18
166	13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49 9·06	10·86	12·50	13·66	172 19
167	14·10	13·63	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	173 19
168	14·05 14·63	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	174 20
169	14·45	14·84	13·95	12·40	10·90	9·46 8·62	8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	175 21
170	15·00	14·86	13·77	12·06	10·27	8·84	8·10	7·94	8·52	9·68 11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56	176 22
171	15·33	14·70	13·32	11·14	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40 7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	177 23
172	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22 5·70	7·84	10·40	12·82	14·74	15·56	179 0
173	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12 15·46	180 1
174	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31	15·28	181 1
175	15·12	13·77	11·30	9·01 7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	11·17	13·22	14·74	15·17	182 2
176	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92 11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	183 3
177	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77	12·64	11·27 9·34	7·48	6·30	5·87	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20	184 4
178	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56 8·50	10·00	11·48	13·23	14·36	14·44	13·38	185 5

179	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30 / 13·98	13·72	12·51	186 6
180	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	13·27	187 6
181	11·87	10·24	8·57 / 7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	188 7
182	11·86	10·30	8·58	7·00	5·74	5·32	5·74 / 6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	189 8
183	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57 / 15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	190 9
184	12·32	10·27	7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40 / 8·23	7·07	6·90	7·82	9·54	11·60	13·35	14·38	14·34	191 10
185	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30 / 11·84	13·92	15·05	14·90	192 11
186	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	193 11
187	15·46	13·17 / 9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46	16·44	194 12
188	15·54	12·76	8·60	5·17	2·76	1·62 / 2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	195 13
189	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36 / 17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	196 14
190	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60 / 9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	197 15
191	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	6·24 / 8·00	10·50	12·97	14·30	14·44	198 16
192	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38 / 13·40	199 17
193	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	200 17
194	12·90	12·68	11·87	10·93	10·01 / 9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	201 18
195	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76 / 10·73	11·74	12·78	13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	202 19
196	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94	12·66 / 11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	203 20
197	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36	7·66	6·38 / 5·86	6·06	7·07	8·94	10·96	13·07	14·58	204 21
198	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02 / 14·00	15·20	205 22
199	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	206 22
200	16·05	15·68	14·35 / 12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	207 23
201	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78 / 8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	209 0
202	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90 / 14·32	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	210 1
203	15·17	22·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76 / 5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	211 2
204	14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76 / 13·95	15·50	15·83	14·93	212 3
205	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	213 3
206	13·84	11·46 / 8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	214 4
207	12·72	10·34	8·27	6·67	6·12	6·40	7·34 / 8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	215 5
208	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96 / 13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	216 6
209	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26 / 9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	217 7
210	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96 / 11·33	12·62	13·38	13·55	12·96	218 8
211	11·68	9·90	7·96	6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	219 8
212	14·02 / 12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	220 9
213	14·86	13·21	10·40	7·41	4·97 / 3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	221 10
214	15·72	13·66	10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08 / 14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	222 11
Sum	1027·69	892·75	725·74	583·23	502·54	476·45	523·48	615·47	754·55	913·26	1051·87	1066·39	1021·39	899·21	742·68	599·35	494·34	482·75	533·46	650·77	799·94	940·31	1041·05	1070·88	No. of Days. 73ᵈ 12ʰ.
No.	74	74	73	73	74	74	74	73	73	74	75	73	73	73	74	74	73	73	73	74	74	73	73	73	18409·55

SERIES M.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
215	16·38	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76 14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	17·16	223 12
216	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80 4·90	7·56	11·10	14·46	16·66	16·88	224 13
217	15·39	12·15	8·23	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52 16·18	16·06	225 14
218	14·38	11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	226 14
219	15·18	13·36	10·62	7·94 6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	227 15
220	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26 10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	228 16
221	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38 11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	229 17
222	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77 7·46	7·69	8·30	9·04	10·10	11·17	12·34	12·90	230 18
223	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48 11·57	12·72	13·42	231 19
224	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	232 19
225	13·64	13·66	13·26 12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	233 20
226	14·40	14·54	13·58	12·17	10·70	9·34	8·82 8·84	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	234 21
227	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12 13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	235 22
228	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24 6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	236 23
229	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36 11·94	14·36	16·04	16·27	238 0
230	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	239 0
231	16·16 14·21	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	240 1
232	15·34	12·80	9·60	7·06	5·50	5·18 5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	241 2
233	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77 15·30	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	242 3
234	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64 7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	243 4
235	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26 10·60	12·24	13·73	14·44	13·86	12·25	244 5
236	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08 11·68	245 6
237	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	246 6
238	11·74	10·42	8·87	7·44 6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	247 7
239	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80 10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	248 8
240	13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98 15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	249 9
241	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27 5·15	5·63	7·24	9·64	12·52	14·74	15·98	250 10
242	15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06 13·28	15·76	16·64	251 11
243	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	252 11
244	17·05	15·47	12·37 8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	253 12
245	16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52 7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	254 13
246	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16 16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	255 14
247	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31 4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	256 15
248	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36 11·36	13·14	13·88	13·60	257 16
249	11·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	258 16

250	12·20	11·38 10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	11·97	259 17
251	11·87	11·54	11·08	10·42	9·92	9·60 9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	260 18
252	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64 11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	8·43	9·42	10·67	11·65	12·46	261 19
253	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92 9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24	262 20
254	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54 7·88	9·68	11·56	13·16	14·03	263 21
255	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87 14·64	264 22
256	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	265 22
257	15·37	14·28	12·24	9·67	7·34 5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	266 23
258	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44 11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	268 0
259	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61 10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	269 1
260	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42 6·51	8·50	11·14	13·77	15·60	15·98	14·86	270 2
261	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46 15·24	13·48	271 3
262	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	272 3
263	12·07	9·24	7·02 5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	273 4
264	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34 10·76	12·86	14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	274 5
265	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66 12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	275 6
266	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72 8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	276 7
267	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60 12·11	13·20	14·04	277 8
268	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	278 8
269	15·38	15·04 13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	279 9
270	16·85	16·30	14·16	10·84	7·77	5·85	5·07 5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	280 10
271	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66 16·26	17·40	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	281 11
272	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14 6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	282 12
273	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50 8·04	11·13	14·40	16·50	17·22	283 13
274	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	284 13
275	16·32 14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	285 14
276	15·01	13·36	11·14	9·11	7·80 7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	286 15
277	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46 12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	287 16
278	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52 8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	288 17
279	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02 8·86	10·06	11·16	12·02	12·40	12·34	289 18
280	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78 12·36	12·58	290 19
281	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	291 19
282	13·28	13·04	12·24	10·77 9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8.86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	292 20
283	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96 9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	293 21
284	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00 14·16	12·26	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	294 22
285	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16 6·40	7·67	9·66	11·93	14·14	15·62	15·76	295 23
286	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84 15·02	16·10	15·46	297 0
Sum	1032·54	910·43	760·26	608·18	501·65	473·80	511·80	621·28	762·12	907·49	1021·76	1072·60	1060·31	924·04	744·15	591·06	495·43	460·89	511·58	610·72	763·36	946·14	1054·15	1072·91	No. of Days. 74^d 13^h.
No.	74	74	75	75	74	74	74	75	75	74	74	74	76	75	74	74	75	75	75	74	74	76	75	74	18418·65

Series M.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour	
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	d	h
287	13·18	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	298	0
288	14·81	11·87	8·55 5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60	299	1
289	13·70	10·52	7·15	4·66	2·92	3·10	4·72 7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78	300	2
290	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96 16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	301	3
291	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86 7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	302	4
292	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	7·92	8·94	10·40 11·85	12·91	13·12	12·26	303	5
293	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	12·06	12·64	304	5
294	12·40 11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48	12·55	305	6
295	12·87	12·46	11·36	9·70	8·28	7·14 6·80	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	306	7
296	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36 12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	307	8
297	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56 10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	308	9
298	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46 3·86	5·60	8·44	11·74	14·64	16·50	309	10
299	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81 17·12	310	11
300	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	311	11
301	17·05	16·14	13·92	11·10 8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	312	12
302	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00 11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	313	13
303	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18 8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	314	14
304	14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50 6·66	8·34	10·52	12·80	14·44	15·18	14·68	315	15
305	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	14·18 14·40	13·64	316	16
306	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	317	16
307	12·96	11·72	10·53 9·66	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	318	17
308	12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16 9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	319	18
309	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50 11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	320	19
310	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04 8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	321	20
311	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13 11·64	13·14	13·94	13·94	322	21
312	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	323	21
313	14·14	12·87 10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	324	22
314	14·20	12·26	9·36	6·51	4·12	2·75 2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	325	23
315	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22 16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	15·17	327	0
316	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23 9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	14·80	328	1
317	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26 10·06	12·76	14·67	15·26	14·06	329	2
318	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	14·72 13·33	330	3
319	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	331	3
320	12·68	10·56	8·18	6·28	4·97 4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	332	4
321	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84 12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	333	5

322	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72 12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	334 6
323	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72 5·86	6·88	8·64	10·40	12·07	13·31	335 7
324	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56 12·60	14·12	336 8
325	14·40	13·86	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	337 8
326	15·24	15·84	15·08	13·13 10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	338 9
327	16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40 8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	339 10
328	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76 14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	340 11
329	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	5·58 4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	341 12
330	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70 14·07	15·87	16·56	342 13
331	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88	15·05	16·23	343 13
332	16·28	14·89 12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	344 14
333	15·18	13·58	11·42	9·46	7·98	7·36	7·62 8·50	10·02	11·60	12·68	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	345 15
334	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26 12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	346 16
335	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76 7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	347 17
336	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70 12·04	13·16	13·78	13·79	13·14	348 18
337	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	349 18
338	12·64 11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	350 19
339	12·44	11·22	9·78	8·36	7·04 6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	351 20
340	12·46	11·00	9·17	7·18	5·75	4·90	4·92	6·07	7·94	10·07 12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	352 21
341	12·54	10·80	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05 10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	353 22
342	13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04 8·06	10·00	12·15	14·04	15·14	15·03	354 23
343	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81 15·20	356 0
344	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	357 0
345	14·94	12·16	8·55	5·06 2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	15·86	358 1
346	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90 12·30	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	359 2
347	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38	17·48 15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	10·96	13·30	14·68	14·83	360 3
348	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17 5·13	6·30	8·60	10·76	12·74	13·74	13·62	361 4
349	12·37	10·30	8·14	6·53	5·84	6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	6·00	7·78	9·85 11·62	12·84	13·10	362 5
350	12·28	10·74	9·22	7·96	7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70	6·37	7·72	9·40	11·06	12·32	363 5
351	12·86	12·50	11·47 10·24	9·12	8·42	8·24	8·54	9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10	364 6
352	13·01	13·12	12·46	11·26	10·02	9·06	8·58 8·66	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	365 7
353	13·68	13·81	12·94	11·57	10·28	9·14	8·62	8·63	9·20	10·44	11·66	12·53 12·92	12·58	11·64	9·77	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	366 8
354	14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	9·64 7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	367 9
355	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36 8·55	11·00	13·44	15·21	368 10
356	15·84	15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	369 10
357	15·93 15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	370 2
Sum	1014·95	885·30	738·49	593·11	478·97	448·53	503·53	595·16	750·39	893·87	1015·57	1078·27	1033·88	910·94	761·64	592·07	476·85	437·85	478·26	584·39	738·21	878·16	989·11	1051·45	No. of Days. $73^d\ 2^h$.
No.	74	73	74	74	73	73	74	73	74	73	73	74	73	73	74	73	72	72	73	72	73	72	72	73	17928·95

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - 2\sigma)$. SERIES O. Motion per mean Solar hour = 13°·9430356.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour d	Solar Hour h
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d	h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28 4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20 11·31	14·16	16·06	16·66	15·40	2	1
2	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94 16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	16·63	16·96 15·24	11·92	3	3
3	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06 13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	14·87	16·40	16·40	14·28	11·00	4	4
4	7·63 4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10 5·05	5·25	6·68	9·24	12·28	14·51	15·96	15·58	13·48	10·47	7·54	5	6
5	5·76	5·07	5·67 7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67 12·12	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6	8
6	6·84	7·54	8·67	10·60	12·84	15·06 16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76	11·80	13·27	14·00 13·64	12·22	10·47	9·05	8·44	8·46	7	10
7	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87 11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	11·16 10·27	9·64	9·60	9·90	8	12
8	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24 7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86 10·17	9	14
9	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74 8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10	15
10	10·84	11·64 12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14 13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11	17
11	11·24	11·97	12·52	12·50	11·87 10·54	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72 11·24	10·02	9·32	9·14	9·46	10·37	11·48	12	19
12	12·46	13·04	12·84	11·88	10·23	3·20	6·52 5·62	5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75 8·76	9·26	10·34	11·68	12·96	13	21
13	13·64	13·36	11·80	9·66	7·32	5·82	5·14	5·44	6·74 8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46 13·64	13·98	14	23
14	13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13 15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	16	0
15	12·44 9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22 8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	13·84	11·50	17	2
16	8·60	5·94	4·37 4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68 7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48	18	4
17	5·34	4·30	4·66	6·25	8·54	11·38 14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06 14·84	14·14	12·06	9·06	6·46	4·67	19	6
18	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45 15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28	14·56	13·33	10·92 8·30	6·04	4·87	5·06	20	8
19	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37 6·37	5·54	5·64	6·83	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30 7·70	21	10
20	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62 9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	22	11
21	10·80	12·97 14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	9·76	11·65	13·04 13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	23	13
22	13·36	14·56	15·02	14·37 12·76	10·76	8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08 9·94	9·11	8·88	9·28	10·22	11·70	13·06	24	15
23	14·14	14·41	13·60	12·06	10·26	8·46	7·10 6·25	6·08	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24 9·34	10·07	11·16	12·40	13·38	25	17
24	13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68 6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46 11·87	12·94	13·44	26	19
25	13·33	12·40	10·74	8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63 14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	27	20
26	14·14 13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12 14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	28	22
27	14·17	11·84	8·82 5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07 6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	30	0
28	12·18	8·44	5·42	3·22	2·16 3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40 11·85	14·65	16·52	16·84	15·28	11·68	31	2
29	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98 17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00 16·86	14·76	11·06	7·36	32	4
30	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66 14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16 6·82	4·54	33	6
31	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94	16·48	13·27	9·84	6·84	4·96 4·33	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	34	7
32	5·14	6·20 8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26 11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	35	9
33	8·04	9·56	11·76	14·24 15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34 14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	36	11
34	10·36	12·08	13·76	14·66	14·44	13·11	11·12 9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72 9·12	9·06	9·26	9·66	10·60	37	13
35	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86 6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77 9·94	10·44	11·32	38	15

36	12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	7·18	8·03 9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	39	16
37	11·27 11·45	11·25	10·76	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76 12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	40	18
38	11·36	11·44	10·97 10·10	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56 11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	41	20
39	11·66	11·34	10·36	8·82	7·36 6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84 8·12	8·96	10·24	11·52	12·40	12·66	42	22
40	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55 9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03 12·66	13·62	13·60	12·30	44	0
41	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85 15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88 11·93	9·10	45	2
42	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26 9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	14·56	14·85	13·63	10·90	7·86	46	3
43	5·57	4·07 4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74 7·26	9·70	12·25	14·42	15·50	15·15	13·08	9·90	6·94	4·75	47	5
44	3·92	4·66	6·62	9·46 12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30 15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	48	7
45	5·52	7·84	10·68	13·68	15·84	16·68 15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53 7·47	5·38	4·52	5·04	6·70	49	9
46	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28 4·54	4·14	5·07	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60 6·54	8·40	10·77	50	11
47	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80 7·87	10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66 13·73	51	13
48	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06	6·46	8·24	10·33	12·41	13·86 14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	52	14
49	14·16	14·12	12·82 10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56 10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	53	16
50	13·06	11·88	10·25	8·57	6·98 5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94 8·44	8·48	9·27	10·44	11·57	12·34	12·34	54	18
51	11·70	10·50	8·90	7·32	5·96	5·24	5·12	5·86 7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56 10·87	11·93	12·44	12·26	55	20
52	11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67 12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36 13·52	12·60	56	22
53	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25 15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	13·76	57	23
54	11·70 8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00 5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	14·57	11·93	59	1
55	8·26	5·48	3·42	2·92 4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84 8·66	11·92	14·74	16·46	16·54	14·66	11·26	7·66	60	3
56	4·94	3·20	3·27	4·70	7·52	10·86 14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55 16·86	16·36	13·86	10·44	6·92	4·54	61	5
57	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46 12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76	15·76	12·96	9·44 6·74	4·67	4·23	62	7
58	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84 3·56	3·86	5·60	8·27	11·55	14·34	16·02	16·28	14·66	11·66	8·60	6·46	5·26	5·46 6·56	63	9
59	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67 9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	64	10
60	10·22	12·44	14·42 15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58 13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	65	12
61	12·96	14·04	14·24	13·22	11·36 9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07 9·16	8·96	9·27	9·77	10·46	11·36	12·44	66	14
62	13·07	13·03	12·12	10·46	8·86	7·68	7·02 7·02	7·66	8·54	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47 10·86	11·44	12·02	12·40	67	16
63	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	9·78 10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26 11·56	11·38	68	18
64	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08 12·36	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	69	19
65	10·78 10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68 10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	70	21
66	11·14	10·07	8·84	7·56 6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16 8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	71	23
67	9·92	8·17	6·67	5·98	6·16	7·20 8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84 11·76	12·97	13·54	13·03	11·46	9·42	73	1
68	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02 15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37 11·16	8·45	6·26	74	3
69	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40 7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44 4·44	75	5
Sum	745·01	691·67	695·23	687·13	680·95	730·71	722·78	789·33	788·74	803·03	774·59	813·78	745·79	764·28	763·48	760·84	779·48	782·19	832·47	816·07	838·97	801·49	803·77	738·84	No. of Days.	
																									74ᵈ 6ʰ.	
No.	75	73	75	74	74	74	74	75	75	74	74	75	73	74	75	74	74	73	75	74	75	74	75	74	18350·62	

FORMS FOR SHORT-PERIOD TIDES.

Series O.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
70	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97 5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	76 6
71	5·52	7·55 10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30 16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	77 8
72	8·92	11·86	14·66	16·40	16·56 15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26 10·83	8·00	5·75	5·11	5·88	7·84	10·46	78 10
73	13·38	15·68	16·60	15·80	13·36	10·12	7·06 4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12 6·08	7·14	9·00	11·56	13·90	79 12
74	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06 8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07 14·08	15·23	80 14
75	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90 15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	81 15
76	14·20 12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06 12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	82 17
77	12·06	10·56	8·92	7·40 6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24 8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	83 19
78	11·22	9·67	8·30	7·06	6·48	6·64 7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44 9·76	11·26	12·36	12·92	12·78	11·94	84 21
79	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26 12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56 13·57	14·06	13·37	11·72	85 23
80	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94 14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05 9·44	87 1
81	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36 6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	14·90	12·22	9·12	88 2
82	6·60	5·05 4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70 6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	89 4
83	5·14	5·64	6·94	9·43	12·61 15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43 17·34	16·56	14·28	10·82	7·84	5·95	5·42	90 6
84	6·12	7·87	10·62	13·66	16·10	17·14	16·46 13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64	12·86 9·53	7·16	5·81	5·93	7·22	91 8
85	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84 4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04 8·26	10·50	92 10
86	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73 11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	93 11
87	13·48 14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48 15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	94 13
88	14·16	13·84	12·27 10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04 9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	95 15
89	12·28	10·94	9·24	7·80	6·78	6·70 7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54 9·90	10·56	11·44	11·92	12·05	11·54	96 17
90	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46 10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81 11·14	11·27	10·92	10·30	97 19
91	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	12·66 12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62 10·00	98 21
92	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47 10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50	99 22
93	9·40	8·46 7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96 7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	101 0
94	8·12	7·40	7·47	8·26 9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52 13·00	13·97	14·12	13·00	11·02	9·05	7·48	102 2
95	6·74	6·92	7·97	9·72	11·72	13·58	14·86 15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06 13·40	10·95	8·28	6·66	6·02	103 4
96	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08 8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34 5·76	5·40	6·24	104 6
97	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91 5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	105 7
98	8·91 11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97 15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	10·07	106 9
99	13·10	15·40	16·44 15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91 14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	107 11
100	15·97	16·50	15·10	12·22	8·67	5·24 3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17 6·07	7·04	9·13	12·00	14·47	15·69	108 13
101	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36 6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70 12·14	14·15	15·02	14·50	109 15
102	12·53	9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40 14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28 11·76	110 17
103	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76 12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	111 18
104	10·14	8·48 6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10 8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	112 20

105	9·47	8·14	7·03	6·54 6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96 7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	113 22
106	8·87	7·52	6·74	6·84	7·66	9·26	11·04 12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64 13·72	13·87	12·97	11·36	9·32	115 0
107	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17 14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86 11·70	9·34	7·26	116 2
108	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16 6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	117 3
109	6·07 6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12 7·30	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97	118 5
110	6·54	7·98	10·16 12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32 16·17	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	119 7
111	8·40	10·90	13·45	15·07	15·35 13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36	16·28	14·70	11·93 9·06	7·20	6·40	6·70	7·74	9·37	120 9
112	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24 3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40 7·02	8·34	10·44	12·60	121 11
113	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80 9·18	11·76	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86	9·36	11·24 13·06	13·96	122 13
114	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43 14·76	13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	123 14
115	12·28	10·40 8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14 8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	124 16
116	9·58	7·94	6·74	6·04 6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	8·56 9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	125 18
117	7·86	6·96	6·92	7·44	8·22	9·26	10·47 12·10	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96 11·44	11·34	10·58	9·56	8·46	126 20
118	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54 13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79 10·06	9·26	8·46	127 22
119	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17 9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78 8·17	129 0
120	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90 7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	130 1
121	7·83	8·24	9·37 10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20 12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	131 3
122	7·93	9·36	11·30	13·16	14·26 14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34 14·46	12·38	10·01	8·14	6·95	6·90	8·01	132 5
123	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83 6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14 6·17	6·50	7·92	10·02	133 7
124	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74 4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94 10·30	12·84	134 9
125	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62 13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	135 10
126	15·64	16·06 14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77 14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	136 12
127	15·74	13·76	10·48	6·92 4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30 5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	137 14
128	12·82	9·66	6·56	4·08	2·67	2·88 4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	6·11	7·20	9·40 12·06	14·14	14·98	14·36	12·18	138 16
129	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15 15·36	16·54	16·23	14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98 13·42	11·66	9·36	139 18
130	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46 14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08 8·18	140 20
131	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84 6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	141 21
132	7·86	6·87	6·74 7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93 7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	142 23
133	7·47	7·24	7·70	8·44	10·00 11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90 12·46	13·44	13·42	12·46	10·72	9·12	8·02	144 1
134	7·47	7·63	8·26	9·76	11·56	13·14	14·05 13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24 11·36	9·64	8·16	7·52	145 3
135	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84 5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84 7·36	7·72	146 5
136	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57 6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	147 6
137	9·10 10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40 15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	148 8
138	11·80	13·62	14·54	14·16 12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90 11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	149 10
Sum	744·58	744·14	745·38	733·90	753·80	700·15	747·98	708·24	728·23	716·84	751·36	754·60	777·61	804·95	814·93	824·98	812·14	820·54	774·60	795·55	779·96	755·00	757·02	755·77	No. of Days 74ᵈ 5ʰ
No.	74	75	74	75	74	73	75	74	74	74	74	74	74	75	75	74	75	74	73	75	75	73	74	74	18302·25

FORMS FOR SHORT-PERIOD TIDES.

SERIES O.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
139	14·02	14·27	13·22	10·78	8·10	5·76 4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54 7·34	8·10	9·52	11·55	13·36	14·27	150 12
140	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70 11·00	13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26 13·66	14·02	12·96	151 14
141	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30 15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96 9·94	152 16
142	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84 10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	153 17
143	7·32	6·03	5·94 6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	8·30 9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	154 19
144	6·70	6·93	7·78	8·83	10·30 11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26 11·83	12·05	11·56	10·60	9·20	8·14	7·72	155 21
145	7·83	8·62	9·82	11·10	12·64	13·94	14·46 14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72 11·06	9·98	8·86	8·32	8·36	156 23
146	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08 8·98	8·20	8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23 8·78	9·20	158 1
147	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54 7·76	8·67	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	159 2
148	11·38 13·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28 13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	160 4
149	12·90	14·12	15·30	15·65 15·48	14·17	12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	16·85 15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	161 6
150	14·21	15·47	16·06	15·22	13·50	10·84 8·22	6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07 8·34	8·17	8·96	10·27	12·23	14·24	162 8
151	15·74	16·29	15·33	12·77	9·46	6·32	4·44	3·62 4·30	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55 12·08	14·54	16·07	163 10
152	16·21	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80 15·92	18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40 16·14	164 12
153	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40 17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96	165 13
154	13·80	10·33 6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05 5·72	5·77	7·00	9·56	12·80	15·12	16·05	15·26	12·76	166 15
155	9·20	6·14	3·95	2·88	3·47 5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41 10·07	13·02	14·92	15·57	14·68	12·28	9·20	167 17
156	6·52	4·77	4·20	4·94	6·52	8·80	11·67 14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32 14·85	14·05	11·96	9·47	7·26	168 19
157	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74 13·76	10·84	8·61	6·86	6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34 8·60	7·57	169 21
158	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31 7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	170 22
159	8·31 8·49	9·03	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53	6·70 7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	172 0
160	8·82	9·24	10·33 11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50 13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	173 2
161	9·33	10·22	11·60	12·90	13·82	13·85 13·08	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	14·17 12·86	11·33	10·04	9·14	8·86	9·20	174 4
162	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85 7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46 8·62	8·24	8·56	9·64	175 6
163	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62 7·74	9·76	12·14	14·01	15·00	14·86	13·77	12·06	10·27	8·84	8·10	7·94	8·52	9·68 11·18	176 8
164	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90 14·56	15·33	14·70	13·32	11·14	9·44	8·17	7·54	7·57	8·34	9·81	11·65	177 9
165	13·20	13·60 12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	15·44	14·56 12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	178 11
166	13·60	12·02	9·66	6·93	4·96 3·94	4·22	5·70	7·84	10·40	12·82	14·74	15·56	15·33	13·80	11·44	9·35	7·79	7·04 7·03	7·90	9·44	11·66	13·22	13·92	13·00	179 13
167	10·74	8·00	5·64	4·04	3·83	4·76	6·70 9·02	11·37	13·67	15·12	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44 12·57	13·67	13·68	12·22	9·64	180 15
168	6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31 15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07 8·44	6·12	181 17
169	4·72	4·42	5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74 7·86	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	182 18
170	5·02 5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57 7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	183 20
171	6·54	7·66	9·24 10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94 12·19	12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56	184 22
172	8·50	10·00	11·48	13·23	14·36	14·44 13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12 9·70	8·48	7·63	7·56	8·14	9·04	186 0
173	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96 7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34 8·14	8·38	9·04	10·37	187 2

174	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87 6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46 11·88	188 4
175	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62 12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	189 5
176	13·02	13·62 13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22 14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	190 7
177	13·97	13·69	12·32	10·27 7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23 7·07	6·90	7·82	9·54	11·60	13·35	14·38	191 9
178	14·34	12·76	10·16	7·15	4·46	2·56	2·27 3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17 9·30	11·84	13·92	15·05	14·90	192 11
179	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54 13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76 16·12	15·46	13·17	193 13
180	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87 15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46	16·44	15·54	12·76	194 14
181	8·60 5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30 5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	195 16
182	5·36	3·22	2·47 3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04 7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	196 18
183	4·20	3·82	5·12	6·97	9·80	13·00 15·56	17·04	17·17	15·44	12·60	9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36 15·40	13·86	11·04	8·20	6·43	5·40	197 20
184	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86 14·11	11·28	8·50	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92 9·08	7·74	7·24	7·56	198 22
185	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38 6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58 8·59	8·86	200 0
186	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24 8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	201 1
187	9·97	10·90 12·12	13·14	13·41	12·71	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46 12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	202 3
188	10·73	11·74	12·78	13·04 12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87 13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	203 5
189	11·70	12·60	12·94	12·66	11·70	10·10	8·56 7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52 8·94	8·94	9·48	10·50	11·72	204 7
190	12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06 7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16 10·36	11·74	13·14	205 9
191	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02 14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	206 10
192	13·92 12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35 12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	14·04	207 12
193	11·84	8·90	6·50 5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57 7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	208 14
194	7·76	5·53	4·56	4·86	6·26 8·20	10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80 13·84	14·90	14·32	12·37	9·57	6·78	209 16
195	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96 16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50 10·90	8·02	5·86	4·76	210 18
196	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47 8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64 5·14	5·97	211 20
197	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77 6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	212 21
198	8·61	10·53 12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48 13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	213 23
199	11·37	13·15	14·57	15·10 14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	13·26	13·32	12·36 10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	215 1
200	13·33	14·29	14·38	13·46	11·64	9·64 7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76 9·04	9·66	10·72	12·02	13·24	216 3
201	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73 7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59 11·83	12·88	13·62	217 5
202	13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	10·20 11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38 13·55	218 7
203	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50 14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	219 8
204	14·02	12·80	10·52 8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54 8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	220 10
205	13·21	10·40	7·41	4·97	3·62 3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85 8·10	10·22	12·92	15·15	16·26	15·72	13·66	221 12
206	10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08 14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07 17·04	16·38	13·96	10·25	222 14
Sum	750·62	738·47	702·83	693·10	664·46	703·65	700·15	741·62	756·99	779·83	810·97	810·04	821·23	808·73	788·43	770·37	769·74	758·91	793·22	799·07	798·23	803·96	779·79	784·21	No. of Days. 73d 4h.
No.	73	73	74	72	73	74	73	74	73	73	73	73	73	74	72	74	72	73	74	74	73	73	73	73	18328·62

FORMS FOR SHORT-PERIOD TIDES.

Series O.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
207	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50 17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12 9·20	5·80	223 16
208	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36 6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	224 17
209	3·52	3·32 4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58 8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62	4·54	225 19
210	4·80	6·25	8·27	11·00 13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70 15·80	15·18	13·36	10·62	7·94	6·32	5·74	6·44	226 21
211	7·77	9·72	12·07	14·12	15·66	15·72 14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48 10·40	8·65	7·45	7·28	8·00	9·26	227 23
212	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78 5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90 9·34	10·06	10·94	229 1
213	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	7·00	7·70 8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82 11·54	230 3
214	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69	8·30	9·04	10·10	11·17 12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	231 4
215	11·96	12·26	11·97 11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57	12·72	13·42	13·56	13·18 12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	232 6
216	12·32	12·18	11·42	10·36	9·08 8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22	10·18 9·34	8·97	9·08	9·88	10·76	11·64	12·26	233 8
217	12·35	11·85	10·40	8·78	7·36	6·44	6·28 7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84	9·26 10·00	11·16	12·50	13·30	13·42	234 10
218	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76 13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97 13·64	12·06	235 12
219	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62 12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	236 13
220	8·24 6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70 6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	237 15
231	5·56	4·97	5·74	7·38 9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83 13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	238 17
222	5·06	6·36	8·22	10·64	13·40	15·80 16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48 13·64	10·66	7·60	5·70	4·96	5·70	239 19
223	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80 9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74 5·64	6·67	8·36	240 21
224	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41 6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30 11·47	241 23
225	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64 13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	243 0
226	14·06	15·24 15·10	13·64	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68 10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	244 2
227	14·44	13·86	12·25	10·02	8·06 6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84 8·57	8·87	9·67	10·67	11·96	13·06	13·46	245 4
228	13·08	11·68	9·86	8·26	6·87	6·17	6·26 7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63 10·54	11·48	12·46	12·92	12·66	246 6
229	11·74	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	10·76 12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84 12·98	12·36	247 8
230	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96 14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	13·40	248 9
231	12·04 10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96 9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44	12·80	249 11
232	10·18	7·37	5·17	3·90 4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63 7·24	9·64	12·52	14·74	15·98	15·46	13·29	9·94	250 13
233	6·63	4·34	3·17	2·53	5·38	8·20 11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28 15·76	16·64	15·75	12·94	9·26	6·06	251 15
234	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33 17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47	12·37 8·44	5·52	3·48	252 17
235	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23 4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	5·38	3·90 4·20	253 19
236	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94 6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	254 20
237	7·04	9·54 12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44 15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	255 22
238	10·58	12·80	14·58	15·36	14·73 12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	11·46 9·44	8·00	7·36	7·56	8·36	9·51	11·10	257 0
239	12·60	13·73	13·94	12·90	11·02	8·73	6·90 5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43	10·94	9·64	8·76	8·44 8·70	9·18	9·95	10·88	12·06	258 2
240	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34 8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66 11·30	11·62	259 4
241	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62 11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	260 5

242	10·80 10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88 11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	261 7
243	10·94	10·46	9·52 8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96 8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	262 9
244	10·92	9·74	8·36	7·26	6·68	6·86 7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74 9·92	11·30	12·38	12·82	12·42	11·17	263 11
245	9·62	7·86	6·55	6·10	6·54	7·88	9·68	11·56 13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16 13·44	12·50	10·70	8·70	264 13
246	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87 10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96 6·07	265 15
247	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74 5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	266 16
248	4·94	5·94 8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·41 11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	267 18
249	6·65	8·86	11·54	14·06	15·76 16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80 13·61	10·52	7·73	5·58	4·88	5·77	7·56	268 20
250	10·04	12·74	14·90	15·94	15·62	13·71	10·64 7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97 5·54	5·42	6·51	8·50	11·14	269 22
251	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67 4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42 9·65	12·22	14·26	271 0
252	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69 14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	272 1
253	14·83 14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13 12·37	10·41	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	273 3
254	12·81	10·83	8·83 7·10	5·78	5·25	5·76	6·66	8·34	10·76	12.86	14·16	14·44	13·68	12·40	10·86	9·52 8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	274 5
255	10·54	9·05	7·64	6·61	6·06	6·30 7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10 10·17	11·30	12·30	12·61	12·14	11·16	275 7
256	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57 12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04 12·52	12·48	11·98	11·16	276 9
257	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17 14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76 10·92	277 11
258	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26 8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	278 12
259	8·36	6·38 5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14 5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	279 14
260	5·85	5·07	5·66	7·50 9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38 16·70	17·32	16·33	13·48	9·84	7·20	5·47	280 16
261	4·98	5·96	7·74	10·58	13·66	16·26	17·40 16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26 12·76	9·26	6·56	5·24	5·38	281 18
262	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14 6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26 5·44	6·06	7·47	282 20
263	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62 5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	283 21
264	10·52 13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56 16·24	16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	284 23
265	13·26	14·41	14·26 12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36 11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	286 1
266	13·64	13·06	11·36	9·07	7·14 5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24 8·54	9·26	10·30	11·46	12·12	12·22	287 3
267	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34 9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14 11·01	11·52	11·46	10·73	288 5
268	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30 12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66 10·30	9·78	289 7
269	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48 10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	290 8
270	10·03	9·26 8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90 8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	291 10
271	9·30	8·14	7·56	7·77 8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12 9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	292 12
272	7·70	7·28	7·65	8·65	10·02	11·54	12·81 13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96 13·77	12·48	10·52	8·76	7·36	293 14
273	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40 11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96 7·92	6·50	6·22	294 16
274	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46 4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	295 17
275	7·67 9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15 13·10	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	296 19
Sum	716·99	703·85	701·16	715·55	748·94	769·12	784·15	788·73	757·19	780·21	739·58	752·49	745·90	763·61	772·47	786·92	811·51	832·13	840·80	821·35	770·38	754·72	741·66	709·07	No. of Days. 74ᵈ 5ʰ.
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	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
276	10·16	12·84	15·02 16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35 16·28	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	297 21
277	14·12	15·94	16·22	14·81	11·87 8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66 7·28	5·94	6·04	7·36	9·64	12·45	14·84	298 23
278	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10 4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70 9·92	12·68	14·78	15·58	300 1
279	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05 14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64 15·04	13·76	301 3
280	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22 15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	302 4
281	10·68	8·54 6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42 8·12	7·64	7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75	303 6
282	9·22	7·66	6·68	6·30 6·72	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84 8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	304 8
283	8·76	7·68	7·01	7·06	7·90	9·22 10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48 12·55	12·87	12·46	11·36	9·70	305 10
284	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54 14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66 12·30	10·26	8·61	306 12
285	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64 9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56 7·12	307 14
286	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10 5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	308 15
287	5·96	6·51	8·24 10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74 14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	309 17
288	6·71	8·67	11·25	13·84	15·52 15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72 14·87	12·03	9·20	7·26	6·32	6·37	7·46	310 19
289	9·60	12·20	14·35	15·67	15·28	13·15	10·15 7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87 6·16	6·46	8·00	10·44	311 21
290	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94 6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00 11·24	13·43	312 23
291	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46 15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52	314 0
292	14·02 13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72 10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	315 2
293	12·06	10·17	8·00	6·25 5·31	5·50	6·66	8·34	10·52	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10 8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	316 4
294	9·16	7·62	6·54	6·20	6·84	7·96 9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00 10·94	11·57	11·80	11·36	10·28	8·94	317 6
295	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86 13·83	12·96	11·72	10·53	9·66	7·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01 10·20	9·26	8·46	318 8
296	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72 10·86	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58 8·94	319 10
297	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88 8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	320 11
298	8·64	8·75	9·38 10·38	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83 10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	321 13
299	8·34	8·96	10·02	11·20	12·46 13·23	13·47	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17 13·63	13·10	11·86	10·18	8·76	7·98	7·96	322 15
300	8·75	10·13	11·64	13·14	13·94	13·94	13·04 11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58 8·10	7·27	7·36	8·22	323 17
301	9·82	11·76	13·33	14·28	14·14	12·87	10·56	7·98	5·77	4·14 3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78 8·22	10·37	324 19
302	12·25	13·88	14·74	14·20	12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03 10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	325 20
303	12·84 14·46	15·08	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47 17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	326 22
304	15·11	15·17	13·27	9·96 6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00 6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	328 0
305	14·80	12·31	8·84	5·46	3·00	1·66 2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74 7·26	10·06	12·76	14·67	15·26	14·06	329 2
306	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96 11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29 14·72	13·33	10·74	330 4
307	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57 15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	12·68	10·56 8·18	331 6
308	6·28	4·97	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94 8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	12·24	10·73	8·96	332 7
309	7·30	6·24 5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56 7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	333 9
310	7·52	7·06	7·44	8·47	10·17 11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45 11·84	12·86	13·08	12·42	11·25	9·75	8·54	334 11

311	7·84	7·88	8·64	10·02	11·65	13·16	14·14 14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88 13·62	12·36	10·67	9·06	8·12	335 13
312	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05 7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97 7·94	7·68	336 15
313	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41 5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	337 16
314	8·05 9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54 12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	338 18
315	9·77	11·52	13·36 14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21 14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	339 20
316	12·02	13·86	14·76	14·17	12·16	8·93 6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98 7·71	7·36	7·70	9·02	10·97	12·94	340 22
317	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16 5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12 9·82	11·91	13·58	14·48	342 0
318	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07 15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24 13·24	343 2
319	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88	15·05	16·23	16·28	14·89 12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	344 3
320	9·47	7·26 5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98 7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	345 5
321	6·54	5·59	5·67	6·77	8·43 10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22 11·48	12·26	12·24	11·15	9·47	8·01	6·87	346 7
322	6·45	6·75	7·83	9·14	10·75	12·56	13·86 14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81 10·84	9·56	8·46	7·76	7·56	347 9
323	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50 10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78 8·48	8·71	348 11
324	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83 8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	349 12
325	9·74 10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85 10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	350 14
326	10·76	11·97	12·94 13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50 13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	351 16
327	11·57	12·76	13·30	13·22	12·46	11·00 9·17	7·18	5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	10·77 9·04	7·98	7·73	8·23	9·70	11·40	352 18
328	12·74	13·42	13·45	12·54	10·80	8·50	6·30	4·47 3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36 8·16	9·80	11·80	13·38	353 20
329	14·33	14·26	13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37 9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04 15·14	354 22
330	15·03	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72 17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	355 23
331	15·20	12·64 9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00 8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	14·94	357 1
332	12·16	8·55	5·06	2·64 1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64 7·65	10·63	13·44	15·46	15·86	14·14	10·98	358 3
333	7·68	4·48	2·36	1·77	3·30	5·83	8·90 12·30	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70 15·36	15·32	13·24	9·92	6·64	359 5
334	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38 17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	10·96	13·30	14·68	14·83	13·24 10·55	7·68	5·43	360 7
335	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76 6·38	5·17	5·13	6·30	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	361 8
336	5·84 6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27 6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	362 10
337	7·28	7·93	9·16 10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70	6·37	7·72	9·40 11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	8·24	363 12
338	8·54	9·54	11·12	12·64	13·57	13·57 12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12 12·46	11·26	10·02	9·06	8·58	8·66	364 14
339	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06 8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	10·28 9·14	8·62	8·63	9·20	365 16
340	10·44	11·66	12·53	12·92	12·58	11·64	9·77	7·86	6·12	5·05 4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24 8·62	9·76	366 18
341	11·04	12·36	13·08	12·90	11·65	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97 12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	367 19
342	11·70	12·96 13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84 15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	368 21
343	13·46	13·82	12·72	10·52 7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37	10·23 8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	369 23
344	14·00	12·18	9·43	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	370 2
Sum	755·04	734·74	751·60	689·56	708·52	694·75	703·48	684·89	727·13	728·87	756·86	776·57	787·04	780·12	786·89	786·56	785·66	782·46	760·00	765·24	764·66	764·68	766·75	756·46	No. of Days.
																									$73^d\ 7^h$.
No.	74	74	75	73	73	74	73	73	72	74	72	74	73	73	73	73	74	74	73	72	74	72	74	73	17998·53

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument (γ). SERIES K. Motion per mean Solar hour = 15°·0410686.

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour d	Solar Hour h
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d	h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	1	23
2	16·66	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	2	23
3	16·63	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	3	23
4	14·87	16·40	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	4	23
5	12·28	14·51	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	5	23
6	9·67	12·12	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	6	23
7	7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7	23
8	7·40	8·29	9·81	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	——	14·02	14·44	13·75	12·27	10·82	9·20	7·93	8	22
9	7·24	7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	9	22
10	7·97	7·14	6·75	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	10	22
11	8·97	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	11	22
12	10·54	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	12	22
13	11·88	10·23	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13	22
14	13·36	11·80	9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	14	22
15	13·98	13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	15	22
16	14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	16	22
17	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	17	22
18	13·55	14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	18	22
19	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	19	22
20	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	20	22
21	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	21	22
22	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	22	22
23	6·68	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	——	6·96	23	21
24	6·23	6·09	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	24	21
25	7·10	6·25	6·08	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	25	21
26	8·47	7·00	5·83	5·38	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	26	21
27	10·74	8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	27	21
28	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	28	21
29	15·08	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	29	21
30	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	30	21
31	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	31	21
32	12·56	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	32	21
33	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	33	21
34	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	34	21
35	5·86	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	35	21

36	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11	11·12	9·30	7·54	6·26	36	21
37	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	37	21
38	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	38	21
39	7·86	7·24	6·94	7·18	—	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76	39	20
40	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	40	20
41	10·97	10·10	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	41	20
42	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	42	20
43	12·40	12·66	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	43	20
44	12·66	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	44	20
45	11·85	13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	45	20
46	10·85	13·07	14·56	14·85	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	46	20
47	9·70	12·25	14·42	15·50	15·15	13·08	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	47	20
48	7·84	10·54	13·30	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	48	20
49	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	49	20
50	5·07	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	50	20
51	4·69	5·80	7·87	10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	51	20
52	4·58	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	52	20
53	5·45	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	53	20
54	6·98	5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	—	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	54	19
55	10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	55	19
56	12·26	11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	56	19
57	13·36	13·52	12·60	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	57	19
58	12·96	14·40	14·74	13·76	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	58	19
59	11·16	13·67	15·38	15·86	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	59	19
60	8·66	11·92	14·74	16·46	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	60	19
61	6·04	9·40	12·86	15·55	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	61	19
62	4·33	7·10	10·34	13·76	15·97	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	62	19
63	3·86	5·60	8·27	11·55	14·34	16·02	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	63	19
64	4·06	4·86	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	64	19
65	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	65	19
66	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	66	19
67	7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	67	19
68	8·87	7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	68	19
69	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78	10·20	—	9·73	9·58	9·87	10·35	10·89	11·10	69	18
70	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	70	18
71	11·40	11·75	11·70	11·14	10·07	8·84	7·56	6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·45	9·64	71	18
72	10·86	12·06	12·78	12·56	11·57	9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	72	18
73	9·84	11·76	12·97	13·54	13·03	11·46	9·42	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	73	18
74	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	74	18
Sum	723·67	769·74	798·21	798·65	762·13	720·27	665·02	622·68	607·77	627·02	667·96	758·10	843·55	919·92	973·32	986·21	945·71	887·75	817·96	736·38	671·32	637·88	629·45	666·34	No. of Days.	
No.	74	74	74	74	73	74	74	74	74	74	73	74	74	74	74	74	73	73	74	74	74	74	73	74	73d 19h. 18237·01	

FORMS FOR SHORT-PERIOD TIDES.

Series K.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
75	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	75 18
76	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	76 18
77	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	77 18
78	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	78 18
79	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	79 18
80	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	80 18
81	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	81 18
82	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	82 18
83	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	83 18
84	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26	—	84 17
85	12·36	12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	85 17
86	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	86 17
87	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	87 17
88	6·40	9·20	12·06	14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	88 17
89	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	89 17
90	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	90 17
91	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	91 17
92	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	92 17
93	5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	93 17
94	6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	94 17
95	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	95 17
96	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	96 17
97	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81	11·14	11·27	97 17
98	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	98 17
99	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	99 17
100	11·36	11·88	11·89	11·44	10·50	—	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	100 16
101	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	101 16
102	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	102 16
103	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	103 16
104	4·32	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	104 16
105	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	105 16
106	2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	106 16
107	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	107 16
108	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	108 16
109	7·44	4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	109 16

110	9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	110 16
111	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	111 16
112	12·72	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	112 16
113	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85	9·40	113 16
114	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	114 16
115	9·00	11·04	12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62	6·47	—	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	115 15
116	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	116 15
117	4·20	4·74	6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	117 15
118	3·77	3·70	5·12	7·30	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	118 15
119	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	119 15
120	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	120 15
121	7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	121 15
122	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	122 15
123	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76	13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	123 15
124	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	124 15
125	11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	125 15
126	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	126 15
127	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	127 15
128	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	128 15
129	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	129 15
130	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	—	12·37	10·74	8·97	7·34	6·24	130 14
131	5·98	6·71	8·26	10·20	12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	131 14
132	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	132 14
133	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	133 14
134	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	134 14
135	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	135 14
136	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	136 14
137	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	137 14
138	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06	14·14	14·98	138 14
139	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	139 14
140	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	140 14
141	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	141 14
142	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	142 14
143	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	143 14
144	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	144 14
145	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	145 14
146	—	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	146 13
147	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	147 13
148	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	148 13
Sum	570·44	551·64	568·43	618·93	689·36	756·30	830·55	870·19	879·69	860·79	823·73	771·49	742·30	726·11	737·99	770·45	815·94	858·86	874·14	890·72	859·37	798·26	718·33	626·24	No. of Days.
No.	73	74	74	74	74	73	74	74	74	74	74	73	74	74	74	74	74	74	73	74	74	74	74	73	73^d 19^h. 18210·25

FORMS FOR SHORT-PERIOD TIDES.

SERIES K.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
149	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22	149 13
150	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	11·55	13·36	14·27	13·92	150 13
151	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00	13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66	14·02	151 13
152	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	152 13
153	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	153 13
154	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24	11·40	154 13
155	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	155 13
156	11·26	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	156 13
157	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37	157 13
158	9·12	10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54	158 13
159	7·76	8·67	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	8·82	7·82	159 13
160	7·50	8·19	9·46	11·28	13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	12·02	9·86	8·00	160 13
161	7·09	6·85	7·72	9·34	11·40	13·77	——	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	13·50	10·84	161 12
162	8·22	6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	162 12
163	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	163 12
164	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14	164 12
165	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	165 12
166	15·96	13·80	10·33	6·77	4·00	2·23	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	166 12
167	16·05	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07	13·02	167 12
168	14·92	15·57	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	168 12
169	12·50	14·32	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86	6·32	6·58	7·80	169 12
170	9·82	12·04	13·55	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	170 12
171	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53	171 12
172	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	172 12
173	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	173 12
174	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85	174 12
175	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	8·62	8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	175 12
176	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77	——	12·06	10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	176 11
177	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56	15·33	14·70	13·32	11·14	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	177 11
178	12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	178 11
179	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	7·84	10·40	12·82	14·74	15·56	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	179 11
180	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	180 11
181	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	181 11
182	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	182 11
183	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	183 11

184	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	184 11
185	9·34	10·94	12·19	12·66	12·27	10·84	9·25	7·90	6·96	6·92	7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	185 11
186	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	186 11
187	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	187 11
188	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	188 11
189	5·74	5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	189 11
190	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	190 11
191	7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54	——	11·60	13·35	14·38	14·34	191 10
192	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	15·05	192 10
193	14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	193 10
194	16·12	15·46	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	194 10
195	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	195 10
196	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04	7·14	196 10
197	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26	6·86	5·22	4·84	5·76	197 10
198	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	198 10
199	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	199 10
200	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	200 10
201	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77	8·47	201 10
202	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50	11·42	10·20	202 10
203	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94	12·66	11·70	203 10
204	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	204 10
205	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	205 10
206	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	206 10
207	13·92	——	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	207 9
208	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	208 9
209	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	209 9
210	11·80	13·84	14·90	14·32	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	210 9
211	10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	211 9
212	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	212 9
213	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	213 9
214	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	214 9
215	6·40	7·34	8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	215 9
216	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	216 9
217	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	217 9
218	7·86	6·50	5·94	6·16	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	218 9
219	9·90	7·96	6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	219 9
220	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	220 9
221	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	221 9
222	16·26	15·72	13·66	10·33	6·96	4·40	3·04	——	3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	222 8
Sum	769·73	738·35	721·10	680·42	642·70	620·46	605·70	645·71	699·54	763·58	829·96	887·21	914·17	945·43	935·76	904·46	859·81	810·17	766·70	727·42	726·27	733·12	751·09	768·07	No. of Days. 73d 19h.
No.	74	73	74	74	74	74	73	73	74	74	74	74	73	74	74	74	74	74	74	73	74	74	74	74	18446·93

FORMS FOR SHORT-PERIOD TIDES.

Series K.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
223	13·60	16·07	17·04	16·38	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	223 8
224	10·36	13·94	16·34	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	224 8
225	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	225 8
226	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	226 8
227	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	227 8
228	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	228 8
229	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	229 8
230	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	230 8
231	8·64	7·77	7·46	7·69	8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38	231 8
232	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	232 8
233	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	233 8
234	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	234 8
235	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	235 8
236	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	236 8
237	12·64	14·21	14·62	13·44	11·00	8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00	—	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	237 7
238	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	238 7
239	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	239 7
240	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06	5·50	5·18	240 7
241	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	241 7
242	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	242 7
243	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·50	243 7
214	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06	244 7
245	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	245 7
246	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	11·74	246 7
247	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	247 7
248	12·36	11·16	9·5	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	248 7
249	13·74	13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	249 7
250	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	9·64	250 7
251	12·52	14·74	15·98	15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	251 7
252	10·06	13·28	15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	—	8·56	5·32	3·44	3·17	252 6
253	4·55	7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	253 6
254	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	254 6
255	2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	255 6
256	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	256 6
257	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	257 6

258	6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	258	6
259	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	259	6
260	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	260	6
261	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	261	6
262	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	262	6
263	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	263	6
264	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	264	6
265	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	265	6
266	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	266	6
267	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	267	6
268	6·00	8·44	——	11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	268	5
269	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	269	5
270	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	270	5
271	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	271	5
272	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	272	5
273	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	273	5
274	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	274	5
275	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	275	5
276	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	276	5
277	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	277	5
278	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	278	5
279	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	279	5
280	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	280	5
281	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40	16·86	14·56	10·89	7·40	4·72	3·37	281	5
282	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	6·06	3·77	282	5
283	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	——	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	283	4
284	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64	284	4
285	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	285	4
286	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	286	4
287	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	287	4
288	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	288	4
289	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	289	4
290	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	290	4
291	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	291	4
292	10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	292	4
293	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	293	4
294	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	294	4
295	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	295	4
296	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	296	4
Sum	617·23	654·72	698·28	764·60	807·84	825·07	812·56	780·34	723·32	704·58	688·28	691·72	722·35	755·99	828·47	884·66	921·14	927·27	897·33	832·70	770·54	696·55	637·83	603·82	No. of Days.	
No.	74	74	73	74	74	74	74	74	73	74	74	74	74	73	74	74	74	74	74	73	74	74	74	74	73d 20h. 18247·19	

FORMS FOR SHORT-PERIOD TIDES.

SERIES K.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
297	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	297 4
298	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	—	6·88	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	298 3
299	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	299 3
300	7·15	4·66	2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	300 3
301	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	301 3
302	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86	302 3
303	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	7·92	8·94	10·40	11·85	12·91	303 3
304	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·54	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	304 3
305	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	305 3
306	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	306 3
307	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	307 3
308	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	308 3
309	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	309 3
310	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	15·52	15·84	14·55	11·68	8·46	5·64	310 3
311	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	311 3
312	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	312 3
313	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	—	14·50	14·36	12·66	313 2
314	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	314 2
315	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	315 2
316	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	316 2
317	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	317 2
318	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72	10·53	9·66	9·14	8·92	8·96	9·17	9·66	10·40	318 2
319	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16	9·64	319 2
320	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	320 2
321	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	321 2
322	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	13·00	11·72	10·14	8·38	7·03	6·27	322 2
323	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	13·94	13·04	11·34	9·30	7·45	5·86	323 2
324	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87	10·56	7·98	5·77	324 2
325	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	14·20	12·26	9·36	6·51	325 2
326	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	13·97	11·41	8·07	326 2
327	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	15·17	13·27	9·96	327 2
328	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	14·80	12·31	328 2
329	8·84	5·46	3·00	—	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12 76	14·67	15·26	329 1
330	14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	330 1
331	14·72	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	331 1
332	13·76	13·96	12·68	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	332 1

333	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	333 1
334	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	334 1
335	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	335 1
336	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	336 1
337	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	337 1
338	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	338 1
339	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	339 1
340	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	340 1
341	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	341 1
342	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	342 1
343	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	343 1
344	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	—	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	344 0
345	13·80	13·45	11·78	9·47	7·26	5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	345 0
346	12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	346 0
347	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	347 0
348	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	348 0
349	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	349 0
350	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	350 0
351	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	8·36	7·04	351 0
352	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	352 0
353	5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	8·50	353 0
354	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	13·00	10·50	354 0
355	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	15·14	15·03	13·10	355 0
356	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	15·20	356 0
357	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	357 0
358	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	358 0
359	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	17·88	16·62	—	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	358 23
360	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	359 23
361	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	360 23
362	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	361 23
363	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	362 23
364	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	8·24	8·54	9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	363 23
365	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	8·58	8·66	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	364 23
366	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	10·28	9·14	8·62	8·63	9·20	10·44	11·66	12·53	12·92	12·58	11·64	9·77	365 23
367	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	366 23
368	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	13·16	367 23
369	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	13·46	13·82	368 23
370	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	369 23
371	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	670·87	618·09	583·62	568·88	596·11	647·59	715·26	782·36	840·22	865·32	889·31	881·87	858·64	828·38	792·71	765·16	776·25	780·49	792·29	804·99	795·42	798·40	770·62	724·27	No. of Days.
No.	75	75	75	73	74	74	74	74	74	73	74	74	74	74	73	73	74	74	74	74	73	74	74	74	73d 22h. 18147·12

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - 2\eta)$. SERIES P. Motion per mean Solar hour $= 14^{\circ}{\cdot}9589314$.

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour d	Solar Hour h
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d	h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	1	23
2	16·66	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	2	23
3	16·63	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	3	23
4	14·87	16·40	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	4	23
5	12·28	14·51	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	5	23
6	9·67	12·12	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	6	23
7	7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7	23
8	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70 12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	9	0
9	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	10	0
10	6·75	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	11	0
11	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	12	0
12	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	13	0
13	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	14	0
14	9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	15	0
15	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	16	0
16	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	17	0
17	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	18	0
18	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06	19	0
19	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	20	0
20	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	11·40	21	0
21	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	22	0
22	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	23	0
23	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76 8·71	6·96	6·23	6·09	6·68	7·86	24	1
24	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	6·56	25	1
25	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	26	1
26	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	6·83	5·22	27	1
27	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	28	1
28	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	8·82	29	1
29	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18	30	1
30	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	16·84	15·28	31	1
31	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	16·86	32	1
32	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	33	1
33	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	34	1
34	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07	13·60	35	1
35	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	36	1

36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11	11·12	9·30	7·54	6·26	6·13	6·68	7·86	9·28	37 1
37	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	38 1
38	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94 7·18	8·03	39 2
39	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76	9·97	9·00	8·00	7·11	6·58	6·74	40 2
40	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	6·85	6·30	41 2
41	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	42 2
42	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47	8·56	6·64	43 2
43	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	12·30	10·24	7·77	44 2
44	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10	45 2
45	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	14·56	14·85	13·63	10·90	46 2
46	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50	15·15	13·08	47 2
47	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	48 2
48	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	49 2
49	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	14·55	15·46	50 2
50	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	10·40	12·80	14·50	51 2
51	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06	6·46	8·24	10·33	12·41	52 2
52	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	10·14	53 2
53	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98	5·77	5·38	5·64	6·37	7·82	54 2
54	9·54	11·17	12·38 13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	55 3
55	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	12·26	11·27	9·76	7·96	6·27	5·06	4·55	5·02	56 3
56	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	12·60	10·86	8·63	6·40	4·63	4·06	57 3
57	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	13·76	11·70	8·84	6·08	4·05	58 3
58	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	14·57	11·93	8·26	5·48	59 3
59	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66	11·26	7·66	60 3
60	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	13·86	10·44	61 3
61	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·41	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76	15·76	12·96	62 3
62	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02	16·28	14·66	63 3
63	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	15·64	15·33	64 3
64	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	65 3
65	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	66 3
66	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	67 3
67	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	9·78	10·74	68 3
68	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	69 3
69	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78 10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	70 4
70	10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	6·74	6·70	7·63	71 4
71	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	9·92	8·17	6·67	5·98	6·16	72 4
72	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	7·27	5·74	5·30	73 4
73	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	74 4
74	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44	75 4
Sum	743·72	718·78	706·28	675·00	674·86	696·17	737·20	796·85	836·16	874·43	894·54	893·37	872·66	838·37	811·25	758·37	723·67	703·57	708·17	707·86	726·33	742·58	757·68	748·31	No. of Days. 74d 5h.
No.	74	74	75	74	74	74	74	75	74	74	74	74	74	74	75	74	74	74	75	74	74	74	75	74	18346·18

FORMS FOR SHORT-PERIOD TIDES.

Series P.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour d h
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
75	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	76 4
76	4·91	4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	77 4
77	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83	78 4
78	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	79 4
79	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	80 4
80	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	81 4
81	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	82 4
82	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	83 4
83	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	84 4
84	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76 11·26	12·36	12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	85 5
85	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	86 5
86	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	6·93	5·38	5·00	5·82	87 5
87	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	88 5
88	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	89 5
89	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	90 5
90	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	7·16	91 5
91	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	92 5
92	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	93 5
93	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	94 5
94	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	95 5
95	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	96 5
96	12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	97 5
97	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	98 5
98	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	99 5
99	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44 10·50	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	100 6
100	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	101 6
101	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	102 6
102	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66	6·02	6·46	7·88	103 6
103	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·22	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	104 6
104	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	105 6
105	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	106 6
106	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	107 6
107	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	108 6
108	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	109 6
109	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	110 6

110	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76	111	6
111	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	112	6
112	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	113	6
113	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	114	6
114	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62 6·47	7·28	8·88	10·96	12·96	115	7
115	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	116	7
116	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	117	7
117	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	118	7
118	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	119	7
119	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	120	7
120	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40	121	7
121	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	122	7
122	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76	13·04	10·84	8·96	7·76	123	7
123	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14	8·84	124	7
124	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	125	7
125	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	126	7
126	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54	13·24	12·12	127	7
127	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	10.06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	128	7
128	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	129	7
129	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57 14·02	130	8
130	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	131	8
131	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	132	8
132	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	133	8
133	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	134	8
134	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	135	8
135	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	136	8
136	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	137	8
137	6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	138	8
138	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54	139	8
139	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	140	8
140	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	141	8
141	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	142	8
142	11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	143	8
143	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	144	8
144	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	145	8
145	14·20	13·97	12·62	10·50	7·84 5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	146	9
146	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	9·10	10·86	12·73	147	9
147	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	148	9
148	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74	8·92	10·62	149	9
Sum	765·35	780·58	802·43	818·37	826·64	805·16	775·77	738·35	698·73	664·17	643·97	655·10	665·06	697·24	738·53	788·71	809·26	827·16	829·40	825·28	802·42	785·13	771·52	779·76	No. of Days.	
No.	74	74	74	74	75	74	74	74	74	74	74	75	74	74	74	75	74	74	74	75	74	74	74	75	74d 5h. 18294·09	

FORMS FOR SHORT-PERIOD TIDES.

Series P.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
149	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	150 9
150	11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00	13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	151 9
151	10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	152 9
152	9·44	11·07	12·61	13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	153 9
153	8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	154 9
154	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	155 9
155	8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	156 9
156	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	157 9
157	8·98	8·20	8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	158 9
158	10·03	8·74	7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	159 9
159	12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28	13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	160 9
160	14·17	12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40 13·77	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	161 10
161	13·50	10·84	8·22	6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	162 10
162	15·33	12·77	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	163 10
163	16·21	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	164 10
164	16·40	16·14	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	165 10
165	15·16	16·42	15·96	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	166 10
166	12·80	15·12	16·05	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	167 10
167	10·07	13·02	14·92	15·57	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	168 10
168	7·65	10·05	12·50	14·32	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86	6·32	169 10
169	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	170 10
170	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	171 10
171	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	172 10
172	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	173 10
173	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	174 10
174	11·00	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	8·62	8·24	8·56	9·64	11·12	12·55	13·40	13·37	175 10
175	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86 13·77	12·06	10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	176 11
176	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56	15·33	14·70	13·32	11·14	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	177 11
177	12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	15·44	14·56	12·56	10·36	8·63	7·61	7·30	7·74	8·86	10·67	12·47	13·67	178 11
178	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	7·84	10·40	12·82	14·74	15·56	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	179 11
179	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	180 11
180	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	181 11
181	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	182 11
182	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	183 11
183	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	184 11

184	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	185 11
185	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	186 11
186	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	187 1
187	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	188 11
188	5·74	5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	189 11
189	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	190 11
190	7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90 7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	191 12
191	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	15·05	14·90	13·08	192 12
192	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	15·46	193 12
193	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46	16·44	194 12
194	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	195 12
195	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04	7·14	10·42	13·85	196 12
196	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26	6·86	5·22	4·84	5·76	8·06	10·85	197 12
197	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	6·24	8·00	198 12
198	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05	6·82	199 12
199	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	6·38	6·51	200 12
200	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77	8·47	7·34	6·76	201 12
201	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50	11·42	10·20	8·76	7·52	202 12
202	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94	12·66	11·70	10·10	8·56	203 12
203	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36	204 12
204	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24	205 12
205	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64 13·76	13·92	12·56	10·36	206 13
206	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	14·04	11·84	207 13
207	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	208 13
208	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	209 13
209	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	14·84	210 13
210	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	211 13
211	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	212 13
212	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	213 13
213	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	214 13
214	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	215 13
215	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	216 13
216	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	217 13
217	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	218 13
218	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	12·80	10·52	8·01	5·84	219 13
219	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	13·21	10·40	7·41	220 13
220	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	15·72	13·66	10·33	221 13
221	6·96 4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	16·38	13·96	10·25	222 14
Sum	758·50	725·12	691·81	657·84	633·01	627·22	644·31	681·17	745·69	791·37	841·75	875·48	902·52	882·87	863·18	836·11	813·57	781·59	762·62	753·46	770·31	765·53	770·30	765·89	No. of Days.
No.	74	73	73	73	73	73	73	73	74	73	73	73	74	73	73	73	74	73	73	73	74	73	73	73	73^d 5^h. 18341·22

FORMS FOR SHORT-PERIOD TIDES.

Series P.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
222	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	223 14
223	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	224 14
224	12·15	8·23	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	225 14
225	14·38	11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	226 14
226	15·18	13·36	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	227 14
227	14·46	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	228 14
228	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	10·10	229 14
229	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69	8·30	9·04	230 14
230	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	231 14
231	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	232 14
232	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	233 14
233	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	234 14
234	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27	235 14
235	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24	236 14
236	6·24	5·17	5·36	6·54	8·54 10·66	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	237 15
237	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	238 15
238	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	239 15
239	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	240 15
240	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	241 15
241	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	242 15
242	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	243 15
243	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	244 15
244	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	245 15
245	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	246 15
246	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	247 15
247	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	13·40	12·04	10·04	7·64	5·76	4·78	5·02	248 15
248	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	249 15
249	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29	9·94	6·63	4·34	250 15
250	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	15·76	16·64	15·75	12·94	9·26	6·06	251 15
251	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53 15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	5·52	252 16
252	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	253 16
253	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	254 16
254	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66	255 16
255	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	256 16
256	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	257 16

257	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	258 16
258	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	259 16
259	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	260 16
260	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	8·34	9·42	261 16
261	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	262 16
262	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	263 16
263	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	264 16
264	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	265 16
265	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	266 16
266	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48 4·66	6·00	8·44	11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	267 17
267	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	268 17
268	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	269 17
269	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	270 17
270	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	271 17
271	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	272 17
272	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·54	10·76	12·86	14·16	14·44	13·68	273 17
273	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	274 17
274	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	275 17
275	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	276 17
276	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	277 17
277	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	278 17
278	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	279 17
279	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	280 17
280	5·96	7·74	10·58	13·66	16·26	17·40	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	281 17
281	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25 17·55	17·22	15·06	11·70	8·40	6·26	5·44	282 18
282	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	283 18
283	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	284 18
284	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	285 18
285	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	286 18
286	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	287 18
287	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	288 18
288	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	289 18
289	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	290 18
290	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	291 18
291	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	292 18
292	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	293 18
293	12·17	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	7·92	6·50	6·22	7·10	8·82	294 18
294	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	295 18
295	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	296 18
Sum	683·96	676·63	701·39	742·61	805·54	846·95	879·65	888·81	886·43	825·84	769·07	711·23	670·97	649·89	657·70	686·26	729·49	790·89	809·39	827·21	817·18	787·58	747·06	708·59	No. of Days.
No.	74	74	74	74	75	74	74	74	75	74	74	74	75	74	74	74	74	75	74	74	74	74	74	74	$74^d\ 4^h$. 18300·32

Series P.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
296	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	7·71 6·07	5·84	6·88	297 19
297	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	298 19
298	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	299 19
299	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	300 19
300	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	301 19
301	7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	302 19
302	9·42	8·12	7·64	7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	303 19
303	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	12.06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	304 19
304	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54	305 19
305	14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36	12·50	14·13	306 19
306	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	307 19
307	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	308 19
308	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67	309 19
309	11·25	13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	310 19
310	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	311 19
311	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	312 19
312	7·35	9·00 11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	313 20
313	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56	314 20
314	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	315 20
315	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	316 20
316	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72	10·53	9·66	317 20
317	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	318 20
318	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	12·64	11·84	319 20
319	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84	320 20
320	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	321 20
321	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	322 20
322	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	323 20
323	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	324 20
324	13·88	14·74	14·20	12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	325 20
325	12·84	14·46	15·08	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	326 20
326	11·20	13·57	15·11	15·17	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	327 20
327	9·32	12·22	14·44	15·50	14·80	12·31 8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	328 21
328	10·06	12·76	14·67	15·26	14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	329 21
329	7·64	10·25	12·77	14·29	14·72	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	330 21
330	6·26	7·94	10·30	12·38	13·76	13·96	12·68	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	331 21

331	6·14	6·54	8·04	10·04	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	332 21
332	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	333 21
333	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	334 21
334	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	335 21
335	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	336 21
336	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	337 21
337	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	338 21
338	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	339 21
339	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	340 21
340	12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	341 21
341	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	342 21
342	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74 6·03	8·20	10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	343 22
343	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	344 22
344	10·02	11·60	12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	345 22
345	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	346 22
346	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	347 22
347	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	348 22
348	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	349 22
349	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	350 22
350	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	351 22
351	9·17	7·18	5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	352 22
352	10·80	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	353 22
353	13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	15·14	354 22
354	15·03	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	355 22
355	15·81	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	356 22
356	15·24	16·17	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	357 22
357	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56 17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	358 23
358	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	359 23
359	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	360 23
360	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	361 23
361	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	362 23
362	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	8·24	8·54	9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	363 23
363	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	8·58	8·66	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	364 23
364	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	10·28	9·14	8·62	8·63	9·20	10·44	11·66	12·53	12·92	12·58	11·64	9·77	365 23
365	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	366 23
366	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	13·16	367 23
367	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	13·46	13·82	368 23
368	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	369 23
369	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	770·71	802·26	798·49	773·28	734·99	690·39	625·86	587·29	575·29	601·92	644·62	709·32	779·56	859·60	887·44	907·40	898·25	864·39	817·12	769·86	732·94	720·86	717·84	737·01	No. of Days. $73^d\ 8^h$.
No.	74	75	74	73	73	74	73	73	73	74	73	73	73	74	73	73	73	73	73	73	73	74	73	73	18006·69

FORMS FOR SHORT-PERIOD TIDES.

Bombay—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma + \sigma - \varpi)$. Series J. Motion per mean Solar hour $= 15^{\circ}\!\cdot\!5854433$.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	—	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	1 22
2	16·06	16·66	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	—	14·24	10·56	7·53	5·57	5·16	6·10	8·63	2 21
3	11·84	14·68	16·63	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	—	9·77	6·90	5·23	4·96	3 20
4	6·16	8·86	12·14	14·87	16·40	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	—	8·68	6·10	4 19
5	5·05	5·35	6·68	9·24	12·28	14·51	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	5 19
6	—	6·22	5·47	5·84	7·18	9·67	12·12	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	6 18
7	10·11	8·00	—	6·64	6·17	6·55	7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	7 17
8	13·87	11·68	9·76	8·10	7·16	—	7·03	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	8 16
9	14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	—	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	9 15
10	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	—	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10 14
11	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	—	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27	11 13
12	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	7·62	—	9·54	11·46	13·22	14·24	14·58	13·94	12·72	12 12
13	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62	5·56	6·50	8·14	—	10·17	12·34	14·10	15·20	15·17	13 11
14	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	—	13·66	15·38	14 10
15	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	—	15 9
16	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	16 9
17	14·04	15·74	—	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	17 8
18	9·66	12·72	15·20	16·55	16·63	—	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	18 7
19	6·25	8·54	11·38	14·15	16·15	16·88	16·08	—	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	19 6
20	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	—	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28	14·56	13·33	10·92	8·30	20 5
21	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	—	8·37	6·37	5·54	5·64	6·83	8·93	11·40	13·32	14·42	14·25	12·47	21 4
22	10·10	7·91	6·34	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	—	6·17	5·70	6·11	7·62	9·70	11·76	13·36	14·14	22 3
23	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	—	6·00	6·68	8·02	9·76	11·65	23 2
24	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	—	6·09	6·68	7·86	24 1
25	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	—	25 0
26	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	26 0
27	5·38	5·68	—	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	26 23
28	6·83	5·22	4·41	4·77	—	6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	27 22
29	11·34	8·72	6·20	4·24	3·38	3·76	5·30	—	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	28 21
30	15·08	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	—	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	29 20
31	13·92	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	—	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	30 19
32	8·40	11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	—	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	31 18
33	4·57	6·12	9·14	12·56	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	—	17·54	18·47	17·66	14·67	11·08	7·54	32 17
34	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	—	17·94	16·48	13·27	33 16
35	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	—	34 15
36	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	35 15
37	15·34	—	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	36 14

38	14·66	14·44	13·11	11·12	——	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	37 13
39	11·82	12·86	13·34	12·82	11·45	10·03	——	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·50	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	38 12
40	9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	——	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	39 11
41	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76	9·97	9·00	8·00	——	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	40 10
42	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	——	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	41 9
43	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	——	5·54	5·82	6·94	8·54	10·36	12·06	42 8
44	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47	8·56	6·64	5·46	5·20	——	5·93	7·55	9·56	43 7
45	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	——	6·33	44 6
46	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	45 6
47	6·86	——	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	14·56	14·85	13·63	10·90	7·86	5·57	4·07	46 5
48	4·04	5·46	7·84	——	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50	15·15	13·08	9·90	6·94	47 4
49	4·75	3·92	4·66	6·62	9·46	12·60	——	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	11·76	48 3
50	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	——	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	49 2
51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	——	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	14·55	50 1
52	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	——	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	10·40	51 0
53	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	——	11·86	9·24	6·90	5·18	4·58	5·06	6·46	51 23
54	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	——	8·73	6·87	5·45	4·92	52 22
55	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	——	6·98	53 21
56	5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	54 21
57	——	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	12·26	55 20
58	11·27	9·76	7·96	——	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	56 19
59	13·36	13·52	12·60	10·86	8·63	6·40	——	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	57 18
60	11·00	12·96	14·40	14·74	13·76	11·70	8·84	6·08	——	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	58 17
61	6·26	8·52	11·16	13·67	15·38	15·86	14·57	11·93	8·26	5·48	3·42	——	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	59 16
62	4·16	4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66	11·26	7·66	4·94	3·20	——	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	60 15
63	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90	——	5·80	8·56	12·33	15·44	17·27	17·40	15·46	61 14
64	12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	——	10·37	13·82	16·13	17·08	62 13
65	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	——	11·44	14·36	63 12
66	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	64 12
67	——	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	65 11
68	11·34	12·96	14·04	——	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	66 10
69	9·77	10·46	11·36	12·44	13·07	——	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	67 9
70	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	——	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	68 8
71	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	——	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	69 7
72	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	——	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	70 6
73	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	——	10·07	8·84	7·56	6·74	6·70	7·63	8·94	71 5
74	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	——	9·92	8·17	6·67	5·98	6·16	72 4
75	7·20	8·87	10·76	12·70	14·06	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	——	7·27	5·74	73 3
76	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	74 3
Sum	762·81	771·19	763·32	757·94	768·36	742·42	745·02	746·89	740·06	729·58	732·71	749·20	745·64	742·01	768·91	774·83	746·57	777·49	768·34	760·60	755·80	738·47	764·47	741·40	No. of Days. $73^d\ 4^h$.
No.	73	74	73	73	74	73	73	74	73	73	73	74	73	72	74	74	71	74	73	73	73	72	74	73	18094·03

FORMS FOR SHORT-PERIOD TIDES.

SERIES J.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
77	—	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	75 2
78	7·57	5·44	—	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	76 1
79	12·86	9·54	6·67	4·92	4·38	—	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	77 0
80	16·52	15·06	12·13	8·73	6·13	4·66	4·99	—	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	77 23
81	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	—	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	78 22
82	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	—	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	79 21
83	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	—	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	80 20
84	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	—	14·52	14·20	12·80	10·64	8·47	81 19
85	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	—	13·60	13·34	12·06	82 18
86	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	—	83 17
87	12·96	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26	84 17
88	12·36	12·92	—	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	85 16
89	9·22	11·16	12·56	13·57	—	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	86 15
90	5·63	6·67	8·88	11·24	13·46	14·86	15·36	—	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	87 14
91	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	14·90	—	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	88 13
92	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	—	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	89 12
93	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	—	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	90 11
94	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	—	7·16	5·81	5·93	7·22	9·26	12·02	91 10
95	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	—	6·48	7·04	8·26	92 9
96	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	—	93 8
97	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	94 8
98	8·47	—	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	95 7
99	9·16	8·84	9·16	9·84	—	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	96 6
100	10·96	10·04	9·60	9·33	9·54	9·90	10·56	—	11·44	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	97 5
101	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	—	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	98 4
102	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	—	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	99 3
103	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	—	11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84	7·76	100 2
104	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	—	12·70	12·87	12·44	11·06	9·52	8·12	101 1
105	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	—	14·12	13·00	11·02	102 0
106	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	—	15·06	102 23
107	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36	16·20	103 23
108	15·32	—	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	104 22
109	16·28	16·72	15·47	12·68	—	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	105 21
110	12·97	15·58	17·14	17·04	14·94	11·68	—	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	106 20
111	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	—	6·15	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24	3·17	2·56	107 19
112	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	—	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	108 18
113	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	—	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	109 17

114	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	——	7·83	9·54	11·58	13·16	13·74	13·28	110 16
115	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	——	8·00	9·34	11·00	12·36	111 15
116	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	——	8·68	112 14
117	10·20	11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	113 14
118	7·85	——	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	114 13
119	5·94	5·93	7·08	——	9·00	11·04	12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	115 12
120	7·74	5·76	4·88	5·14	6·58	8·88	——	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	116 11
121	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	——	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	117 10
122	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	——	15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	118 9
123	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	——	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	119 8
124	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36	——	16·28	14·70	11·93	9·06	7·20	6·40	6·70	120 7
125	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	——	13·50	10·52	8·22	6·72	121 6
126	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	——	9·46	122 5
127	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76	13·04	10·84	123 5
128	——	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	124 4
129	12·06	10·14	8·84	——	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	125 3
130	13·92	12·90	11·41	10·00	8·90	——	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	126 2
131	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	——	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	127 1
132	10·97	12·22	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	——	8·80	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	128 0
133	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	——	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	128 23
134	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	——	8·52	10·00	11·40	12·36	12·92	12·66	11·62	129 22
135	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	——	10·20	12·12	13·50	14·22	130 21
136	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	——	10·95	13·28	131 20
137	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	132 20
138	——	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	133 19
139	9·77	13·00	——	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	134 18
140	4·23	7·22	10·62	13·96	16·50	——	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	135 17
141	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	——	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	136 16
142	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	——	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	12·82	137 15
143	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	——	12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06	14·14	14·98	138 14
144	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	——	9·56	7·54	6·48	6·38	7·36	9·30	11·76	139 13
145	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	——	9·46	7·72	6·96	6·82	7·44	140 12
146	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	——	7·84	6·86	141 11
147	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	——	142 10
148	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82	143 10
149	9·01	7·20	——	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96	144 9
150	12·62	10·76	8·52	6·66	5·32	——	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	145 8
151	14·20	13·97	12·62	10·50	7·84	5·72	4·46	——	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	146 7
152	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	——	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	147 6
153	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	——	7·24	9·70	12·30	14·40	15·74	15·70	14·12	13·14	9·74	8·36	7·64	148 5
Sum	755·67	750·24	740·17	758·79	737·14	736·63	754·33	742·58	748·16	775·97	758·28	779·80	783·39	780·79	779·34	787·09	769·15	771·73	768·24	757·15	752·14	766·26	750·58	757·83	No. of Days. 74d 2h.
No.	74	74	73	75	74	73	75	73	74	75	73	74	74	74	74	75	74	74	75	74	74	75	74	74	18261·45

FORMS FOR SHORT-PERIOD TIDES.

SERIES J.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
154	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	—	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	149 4
155	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	—	14·66	15·94	16·04	14·86	12·64	150 3
156	10·27	8·44	7·54	7·34	8·10	9·52	11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00	13·46	—	15·32	16·07	15·67	151 2
157	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30	—	152 1
158	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	153 1
159	15·12	15·06	—	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	11·58	154 0
160	13·28	14·64	14·97	14·22	—	12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	154 23
161	10·30	11·90	13·54	14·68	14·80	13·77	12·16	—	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	155 22
162	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	—	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86	156 21
163	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	—	8·98	8·20	8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	11·84	157 20
164	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	—	7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	158 19
165	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	8·82	—	7·82	7·50	8·19	9·46	11·28	13·22	159 18
166	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	12·02	9·86	8·00	7·09	—	6·85	7·72	9·34	160 17
167	11·40	13·77	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16	4·95	5·15	—	161 16
168	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	9·46	6·32	4·44	3·62	162 16
169	4·30	—	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	11·87	8·16	5·07	163 15
170	3·07	2·74	3·80	5·94	—	9·24	12·80	15·92	18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14	14·28	10·90	164 14
171	7·10	4·31	2·62	2·37	3·68	6·30	—	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96	165 13
172	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	—	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	166 12
173	16·05	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	—	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07	167 11
174	13·02	14·92	15·57	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	—	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	168 10
175	7·65	10·05	12·50	14·32	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	—	16·46	15·74	13·76	10·84	8·61	6·86	169 9
176	6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	—	14·58	12·66	10·40	170 8
177	8·31	7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	14·75	—	13·73	171 7
178	12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	172 7
179	13·34	—	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	173 6
180	13·82	13·85	13·08	—	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08	174 5
181	11·26	12·44	13·30	13·52	12·80	11·00	—	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	8·62	8·24	175 4
182	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	—	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77	12·06	10·27	8·84	176 3
183	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	—	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56	15·33	14·70	13·32	11·14	177 2
184	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	—	4·04	4·96	6·82	9·02	11·57	13·86	15·24	15·44	14·56	178 1
185	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	—	4·22	5·70	7·84	10·40	12·82	14·74	15·56	179 0
186	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	—	6·70	9·02	11·37	13·67	179 23
187	15·12	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	—	10·02	180 22
188	12·26	14·31	15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	181 22
189	—	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·43	182 21
190	8·07	10·12	11·98	—	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	183 20

191	6·54	7·66	9·24	10·97	12·94	14·38	—	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	184 19
192	6·96	6·92	7·56	8·50	10·00	11·48	13·23	14·36	—	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	185 18
193	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98	13·72	—	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	186 17
194	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	13·27	—	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	187 16
195	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	—	10·30	8·58	7·00	5·74	5·32	5·74	6·86	188 15
196	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	—	8·20	6·16	4·76	4·31	189 14
197	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	—	7·76	5·44	190 13
198	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	7·15	191 13
199	—	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	15·05	14·90	13·08	192 12
200	9·91	6·43	3·53	—	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	193 11
201	15·46	13·17	9·32	5·65	2·96	—	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	194 10
202	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	—	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	195 9
203	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	—	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	196 8
204	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	—	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26	6·86	197 7
205	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	—	10·24	12·80	15·30	16·34	15·86	14·11	11·28	198 6
206	8·50	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	—	11·11	13·10	14·71	15·40	14·72	199 5
207	12·96	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	—	12·55	13·78	200 4
208	14·07	13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	201 4
209	—	13·14	13·41	12·71	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	202 3
210	10·73	11·74	—	12·78	13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	203 2
211	9·50	9·87	10·64	11·70	12·60	—	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	204 1
212	9·52	8·94	8·94	9·48	10·50	11·72	12·63	—	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	205 0
213	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	—	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	205 23
214	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	13·92	12·56	—	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	206 22
215	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	14·04	11·84	—	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	207 21
216	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	—	5·53	4·56	4·86	6·26	8·20	208 20
217	10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78	5·10	—	4·56	5·42	209 19
218	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76	—	210 18
219	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64	211 18
220	5·14	5·97	—	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	212 17
221	7·02	5·96	5·96	7·12	—	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	213 16
222	10·98	9·00	7·60	6·88	7·24	8·26	9·66	—	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	13·26	214 15
223	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	—	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	215 14
224	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	—	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	216 13
225	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	—	13·62	13·44	12·54	11·15	9·50	7·86	6·50	5·94	217 12
226	6·16	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	—	13·55	12·96	11·68	9·90	7·96	218 11
227	6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	—	14·26	14·02	12·80	219 10
228	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	—	220 9
229	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·32	12·92	15·15	221 9
230	16·26	—	15·72	13·66	10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	222 8
Sum	769·97	761·46	759·40	765·29	765·97	782·88	770·07	774·24	798·18	787·97	788·89	797·91	776·78	778·93	784·36	757·58	770·02	765·98	745·04	775·30	744·58	773·91	780·60	763·40	No. of Days.
No.	74	74	74	74	74	75	74	74	75	74	74	75	74	74	75	73	74	75	73	75	73	74	75	73	74d 3h. 18538·71

Series J.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
231	13·60	16·07	17·04	16·38	——	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07	223 7
232	7·18	10·36	13·94	16·34	17·16	16·04	13·12	——	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	224 6
233	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	——	8·23	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	225 5
234	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	——	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	226 4
235	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	——	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	227 3
236	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48	10·40	8·65	7·45	——	7·28	8·00	9·26	10·72	12·27	13·74	228 2
237	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	——	9·34	10·06	10·94	229 1
238	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	——	9·77	230 0
239	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69	8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	231 0
240	10·00	——	10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	231 23
241	10·73	10·26	9·92	9·63	——	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	232 22
242	12·36	11·22	10·18	9·34	8·97	9·08	——	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	233 21
243	14·54	13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	——	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	234 20
244	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	——	11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	235 19
245	11·70	13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	——	14·21	14·62	13·44	11·00	8·24	6·24	5·17	5·36	6·54	236 18
246	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	——	14·67	12·76	10·00	7·37	5·56	4·97	237 17
247	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83	13·20	15·21	15·71	——	14·43	11·89	8·54	6·26	238 16
248	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	——	10·66	239 15
249	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	240 15
250	9·63	——	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	241 14
251	14·00	11·50	8·72	——	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	242 13
252	15·06	14·75	13·17	10·76	8·64	7·30	——	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	243 12
253	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	——	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06	6·46	5·62	5·78	6·47	244 11
254	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	——	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	245 10
255	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	——	9·63	10·54	11·48	12·46	12·92	12·66	11·74	10·42	8·87	246 9
256	7·44	6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	——	9·14	9·86	10·86	12·02	12·84	12·98	12·36	247 8
257	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	——	9·04	10·38	12·00	13·14	248 7
258	13·74	13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	——	9·98	249 6
259	12·06	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	250 6
260	——	9·64	12·52	14·74	15·98	15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	251 5
261	4·58	6·80	10·06	——	13·28	15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	252 4
262	3·44	3·17	4·55	7·26	10·87	——	14·22	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	253 3
263	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	——	16·86	16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	254 2
264	12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	——	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	255 1
265	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	——	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	256 0
266	14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	——	11·46	9·44	8·00	7·36	7·56	8·36	9·51	256 23
267	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43	——	10·94	9·64	8·76	8·44	8·70	257 22

268	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	—	9·88	9·34	258 21
269	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	11·08	10·42	259 21
270	—	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	260 20
271	11·53	10·97	—	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	261 19
272	12·82	12·62	12·04	10·96	9·85	—	8·96	8·54	8·43	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86	262 18
273	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	—	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	263 17
274	9·68	11·56	13·16	14·02	14·06	13·18	11·60	9·86	8·07	6·97	—	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	264 16
275	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	—	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	265 15
276	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	—	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	266 14
277	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	—	11·24	13·97	15·67	15·66	14·20	267 13
278	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	—	15·34	16·35	268 12
279	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	—	269 11
280	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	270 11
281	14·84	16·21	—	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	271 10
282	9·97	12·69	14·83	15·87	15·16	—	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	272 9
283	5·87	7·97	10·37	13·07	14·81	15·06	14·13	—	12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	273 8
284	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	—	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	274 7
285	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	—	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	275 6
286	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	—	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	276 5
287	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	—	9·06	7·37	6·82	7·46	8·74	277 4
288	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26	—	8·63	6·70	5·98	278 3
289	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	—	279 2
290	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	280 2
291	5·94	4·14	—	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40	16·86	14·56	281 1
292	10·89	7·40	4·72	3·37	—	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	282 0
293	15·72	12·71	9·14	6·06	3·77	3·17	4·42	—	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	282 23
294	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	—	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	283 22
295	13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	—	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	284 21
296	9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	—	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	285 20
297	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	—	14·36	14·36	13·40	11·82	10·44	9·16	286 19
298	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	—	13·28	12·32	11·06	287 18
299	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	—	288 17
300	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	289 17
301	12·34	—	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	290 16
302	11·78	12·36	12·58	12·54	—	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56	7·77	8·55	291 15
303	9·74	11·07	12·15	12·94	13·28	13·04	—	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28	292 14
304	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	—	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	293 13
305	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	—	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	294 12
306	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	—	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	295 11
307	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	—	3·86	5·14	7·32	10·15	13·10	15·67	296 10
Sum	770·20	754·83	755·15	768·99	750·37	757·72	766·45	767·85	763·27	751·63	766·70	740·98	738·34	753·48	742·69	751·19	770·36	759·39	773·99	786·32	780·88	788·02	776·86	766·77	No. of Days.
No.	75	74	74	75	73	74	74	74	74	73	75	74	73	75	73	74	75	73	74	75	74	75	74	74	74d 2h. 18302·43

FORMS FOR SHORT-PERIOD TIDES.

Series J.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
308	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	—	5·44	8·15	11·37	297 9
309	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46	2·87	4·17	—	6·35	298 8
310	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	299 8
311	7·47	—	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	300 7
312	3·72	5·55	8·04	—	11·05	14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	301 6
313	4·70	4·22	5·00	6·80	9·02	11·88	—	14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	302 5
314	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	—	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	7·92	8·94	10·40	11·85	12·91	13·12	303 4
315	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	—	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	304 3
316	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	—	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	305 2
317	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	—	14·54	14·38	13·40	11·67	9·60	7·53	6·30	306 1
318	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	—	14·96	13·80	11·64	9·03	307 0
319	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	—	13·56	307 23
320	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	308 23
321	—	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	15·52	309 22
322	15·84	14·55	11·68	—	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	9·60	12·20	310 21
323	14·35	15·67	15·28	13·15	10·15	7·00	—	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	311 20
324	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	—	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	312 19
325	7·35	9·00	11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	—	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	313 18
326	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	—	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	314 17
327	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	—	8·34	10·52	12·80	14·44	15·18	14·68	13·32	315 16
328	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	—	11·14	12·91	14·18	14·40	316 15
329	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	—	11·46	12·86	317 14
330	13·86	13·83	12·96	11·72	10·53	9·66	9·14	8·92	8·9[illegible]	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	318 14
331	—	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	319 13
332	10·42	11·46	12·48	—	13·10	13·15	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	320 12
333	8·75	9·38	10·38	11·46	12·41	—	13·07	13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	321 11
334	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	—	13·47	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	322 10
335	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	—	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	323 9
336	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	—	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	324 8
337	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	14·20	12·26	—	9·36	6·51	4·12	2·75	2·94	4·56	7·03	325 7
338	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	13·97	11·41	—	8·07	4·96	2·57	1·63	2·58	326 6
339	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	15·17	13·27	9·96	6·40	—	3·62	1·76	327 5
340	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	14·80	12·31	8·84	5·46	3·00	328 5
341	—	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	14·67	15·26	14·06	11·32	8·05	329 4
342	5·16	2·94	—	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	14·72	13·35	330 3
343	10·74	7·81	5·32	3·66	3·26	—	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	13·76	331 2
344	13·96	12·68	10·56	8·18	6·28	4·97	4·83	—	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	332 1
345	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	—	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	333 0

346	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	—	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	333 23
347	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	—	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	334 22
348	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	—	11·26	12·78	13·82	14·20	13·74	335 21
349	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	—	12·75	13·98	336 20
350	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	—	337 19
351	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	338 19
352	11·52	13·36	—	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	339 18
353	8·31	10·05	12·02	13·86	—	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	340 17
354	7·36	7·70	9·02	10·97	12·94	14·40	14·70	—	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	341 16
355	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12	—	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	342 15
356	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	—	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88	15·05	16·23	16·28	343 14
357	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	—	5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17	344 13
358	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	6·54	—	5·59	5·67	6·77	8·43	10·27	12·17	345 12
359	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	—	6·75	7·83	9·14	346 11
360	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	—	347 10
361	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	348 10
362	8·71	—	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	349 9
363	9·44	9·04	9·10	9·74	—	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	350 8
364	11·78	10·77	9·72	9·06	9·01	9·55	10·76	—	11·97	12·94	13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	351 7
365	13·50	13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	—	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75	4·90	4·92	6·07	7·94	10·07	352 6
366	12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	—	12·74	13·42	13·45	12·54	10·80	8·50	6·30	4·47	3·64	4·12	5·82	353 5
367	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	—	13·38	14·33	14·26	13·00	10·50	7·72	5·17	3·42	2·93	354 4
368	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	—	15·14	15·03	13·10	10·20	7·00	4·27	355 3
369	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	—	15·20	12·64	9·26	356 2
370	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	—	14·94	357 1
371	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	15·86	358 1
372	14·14	—	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70	359 0
373	15·36	15·32	13·24	9·92	—	6·64	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	359 23
374	10·96	13·30	14·68	14·83	13·24	10·55	—	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	360 22
375	6·30	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	—	6·53	5·84	6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	361 21
376	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	—	7·96	7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	362 20
377	8·24	6·78	5·82	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	—	8·42	8·24	8·54	9·54	11·12	12·64	13·57	13·57	12·88	363 19
378	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	—	8·58	8·66	9·44	10·68	11·96	12·92	364 18
379	13·14	12·66	11·54	10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	10·28	9·14	—	8·62	8·63	9·20	10·44	365 17
380	11·66	12·53	12·92	12·58	11·64	9·77	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	8·44	—	8·24	366 16
381	8·62	9·76	11·04	12·36	13·08	12·90	11·65	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	367 16
382	—	8·26	8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	368 15
383	8·38	7·80	7·97	—	9·00	10·56	12·24	13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37	369 14
384	10·23	8·53	7·47	7·31	7·97	9·38	—	11·36	13·14	14·17	14·00	12·18	9·43	6·77	4·83	3·98	4·52	6·17	8·54	11·10	13·61	15·49	16·36	15·78	370 13
385	13·85	11·34	9·14	7·57	7·01	7·14	8·33	10·10	—	12·14	13·77	14·42	13·51	11·13	8·22	5·94	...	...	...	...	...	...	...	...	371 4
Sum	751·35	757·98	769·15	743·83	753·45	772·13	754·10	763·62	765·09	760·54	763·39	773·08	780·94	777·30	769·74	790·39	768·99	774·15	782·99	766·54	767·24	758·51	735·08	753·06	No. of Days. 74d 18h.
No.	74	75	76	74	75	76	74	75	75	75	75	75	76	75	75	76	74	74	75	74	74	74	73	75	18352·64

FORMS FOR SHORT-PERIOD TIDES.

Bombay—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - 3\sigma + \varpi)$. Series Q. Motion per mean Solar hour = 13°·3986609.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour d	h
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d	h
1	15·52	12·96	9·13	5·76	3·03 1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14 11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06 16·66	15·40	12·16	2	2
2	8·40	4·86	2·56	1·71	2·90	5·56 8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57 5·16	6·10	8·63	11·84	14·68	16·63	16·96	15·24	11·92 8·00	4·87	3	5
3	2·80	2·57	4·24	6·84	10·20	14·07	17·26 18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86 12·14	14·87	16·40	16·40	14·28	11·00	7·63	4·88	3·55 3·86	4	8
4	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80 12·16	8·68	6·10	5·05	5·25	6·68	9·24	12·28	14·51	15·96 15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	5	10
5	9·17 12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47 5·84	7·18	9·67	12·12	14·04	15·00	14·45	12·62	10·24 8·07	7·04	6·84	7·54	8·67	10·60	12·84	6	13
6	15·06	16·36 16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76 11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46 9·03	9·97	11·20	13·05	14·64	15·46	7	16
7	15·18	13·87	11·68 9·76	8·10	7·16	7·03	7·40	8·29	9·82	11·16	12·55	13·24 13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70 12·96	14·02	14·44	13·75	12·27	8	19
8	10·82	9·20	7·93	7·24	7·06 7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60 10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36 12·72	11·71	10·43	9·14	9	22
9	7·97	7·14	6·75	6·94	7·74	8·96 10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12 10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42 8·97	7·80	6·96	11	1
10	6·38	6·44	7·28	8·73	10·47	12·14	13·23 13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44 11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16 5·74	6·34	12	4
11	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72 11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04 12·84	11·88	10·23	8·20	6·52	5·62	5·56	6·50	8·14	13	6
12	10·17 12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75 8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66 7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	14	9
13	15·38	15·87 15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74 12·46	13·64	13·98	13·00	10·84	8·24	6·20	4·76	4·46 5·40	7·36	9·78	12·57	14·82	16·13	15·97	15	12
14	14·56	12·25	10·05 8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09 12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·41	11·24	14·04 15·74	16·36	15·71	13·82	11·22	16	15
15	8·94	7·54	6·94	7·15 8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94 4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27 12·77	9·97	7·86	6·84	17	18
16	6·68	7·56	9·32	11·40	13·55 14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25 8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76 6·12	6·34	7·60	18	21
17	9·84	12·14	14·06	14·84	14·14	12·06 9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87 16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16 10·65	12·88	20	0
18	14·28	14·56	13·33	10·92	8·30	6·04	4·87 5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00 8·37	6·37	5·54	5·64	6·83	8·93	11·40	13·32	14·42 14·25	21	3
19	12·47	10·10	7·91	6·34	5·70	6·30	7·70	9·76 12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70 6·11	7·62	9·70	11·76	13·36	14·14	13·72	12·06	22	5
20	9·94 8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50 15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	9·76 11·65	13·04	13·76	13·34	12·14	10·65	9·07	23	8
21	8·15	8·14 8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76 8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	13·36 13·34	12·38	11·08	9·94	9·11	8·88	24	11
22	9·28	10·22	11·70 13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08 6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18 10·75	9·76	9·24	9·34	10·07	25	14
23	11·16	12·40	13·38	13·66 13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78	8·55 10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11 8·87	9·40	10·46	11·87	26	17
24	12·94	13·44	13·33	12·40	10·74 8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53 15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53 11·24	12·70	13·80	27	20
25	14·14	13·30	11·34	8·72	6·20	4·24	3·38 3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36 11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55 15·08	14·17	28	23
26	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88 11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27 5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18 8·44	30	2
27	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10 18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40 11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	31	4
28	2·74 2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42 8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00 16·86	14·76	11·06	7·36	4·34	2·72	2·99	32	7
29	4·86	7·74	11·40 14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93 4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16 6·82	4·54	3·58	4·44	6·36	9·36	33	10
30	12·84	15·86	17·74	17·94 16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66 13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14 6·20	8·06	10·66	13·66	16·02	34	13
31	17·12	16·74	14·88	11·68	8·76 6·34	4·92	4·74	5·86	8·26	11·07	15·60	15·16	15·34 14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24 15·60	16·04	15·34	35	16
32	13·02	10·16	7·86	6·27	5·54	5·86 7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39 8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11 11·12	9·30	36	19

33	7·54	6·26	6·13	6·68	7·86	9·28	10·86 12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26 9·66	10·60	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48 6·86	37	22
34	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92 11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	11·32 12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	39	0
35	7·18 8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12 10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76 9·97	9·00	8·00	7·11	6·58	6·74	7·44	40	3
36	8·51	9·84 10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34 9·17	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87 6·85	6·30	6·50	7·26	8·50	10·16	41	6
37	11·44	12·65	13·26 13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76 10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82 6·94	8·54	10·36	12·06	13·46	42	9
38	13·97	13·64	12·30	10·76 9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66 12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72 13·53	14·67	14·84	13·98	43	12
39	12·14	10·00	8·54	7·66	7·53 8·16	9·56	11·03	12·66	13·62	13·60	12·30	10·24	7·77	5·88 4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23 13·64	11·13	9·02	44	15
40	7·54	6·79	7·00	8·13	9·87	11·85 13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86 9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46 6·24	5·96	45	18
41	6·74	8·48	10·85	13·07	14·56	14·85	13·63 10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83 16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26 9·70	46	21
42	12·25	14·42	15·50	15·15	13·08	9·90	6·94	4·75	3·92 4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93 8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	47	23
43	15·12 15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68 13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23 4·46	6·07	8·56	11·57	14·06	15·54	15·51	49	2
44	13·57	10·53 7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26 14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74 12·44	14·55	15·46	14·76	12·57	9·68	50	5
45	7·24	5·84	5·60 6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54 5·62	4·54	4·69	5·80	7·87	10·40	12·80	14·50	15·06 14·03	11·86	9·36	7·58	6·64	51	8
46	6·76	7·86	9·60	11·66	13·73 15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06 6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53 8·05	7·40	7·66	8·58	52	11
47	9·92	11·68	13·36	14·16	14·12	12·82 10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	10·14 11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28 8·67	9·76	11·20	53	14
48	12·50	13·18	13·06	11·88	10·25	8·57	6·98 5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02 12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44 11·57	12·34	54	17
49	12·34	11·70	10·50	8·90	7·32	5·96	5·24	5·12 5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86 10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	55	19
50	12·26 11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52 10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60 7·21	7·64	9·18	11·00	12·40	13·36	13·52	12·60	56	22
51	10·86	8·63 6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56 16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83 11·00	12·96	14·40	14·74	13·76	11·70	8·84	58	1
52	6·08	4·05	3·42 4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87 9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86 14·57	11·93	8·26	5·48	3·42	59	4
53	2·92	4·14	6·52	9·58 13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16 4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66	11·26	7·66 4·94	3·20	3·27	4·70	60	7
54	7·52	10·86	14·63	17·06	17·98 16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40 12·86	15·55	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90 5·80	8·56	12·33	61	10
55	15·44	17·27	17·40	15·46	12·03	8·50 5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76 15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82 16·13	17·08	62	13
56	16·40	13·86	10·50	7·26	4·84	3·56	3·86 5·60	8·27	11·55	14·34	16·02	16·28	14·66	11·66	8·60	6·46 5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88 12·00	63	16
57	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24 14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36 10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	64	18
58	5·93 4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92 12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04 14·24	13·22	11·36	9·36	7·56	6·27	5·84	65	21
59	6·34	7·46 9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96 9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46 8·86	7·68	7·02	7·02	7·66	8·54	67	0
60	9·66	10·96	12·24 12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86 11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67 7·94	8·50	9·00	9·78	10·74	68	3
61	11·76	12·46	12·67	12·27 11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56 11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34 9·30	10·46	11·44	12·08	69	6
62	12·36	12·27	12·03	11·50	10·78 10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32 9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56 12·46	13·04	13·10	70	9
63	12·54	11·68	10·56	9·64	9·08	8·82	9·16 9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56 6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68 12·86	11·34	71	12
64	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06 12·78	12·56	11·57	9·92	8·17	6·67	5·98	6·16	7·20 8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96 7·55	72	15
65	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46 9·42	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02 15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	73	17
66	6·86 8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16 5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22 10·40	7·86	6·06	5·25	5·54	6·90	9·24	74	20
Sum	747·98	740·35	747·10	742·53	763·46	739·17	764·06	778·00	780·85	765·81	754·39	746·88	750·22	787·54	746·59	773·31	769·37	783·82	751·20	779·06	757·21	777·05	774·22	732·98	No. of Days.	
No.	75	73	74	72	75	73	75	74	74	74	73	74	73	75	73	75	74	75	72	74	73	75	75	73	73ᵈ 21ʰ. 18253·15	

FORMS FOR SHORT-PERIOD TIDES.

SERIES Q.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
67	11·72	13·95	15·20 / 15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	8·94 / 11·85	14·34
68	16·00	15·20	12·86	9·54 / 6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73 / 16·07
69	12·13	8·73	6·13	4·66	4·99 / 6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90
70	5·75	5·11	5·88	7·84	10·46	13·38 / 15·68	16·60	15·80	13·36	10·12	7·06	4·83
71	7·14	9·00	11·56	13·90	15·66	15·98	14·76 / 13·06	8·90	6·13	4·34	3·62	4·36
72	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08 / 4·76	4·47	5·46	7·26	9·48
73	13·77 / 14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49 / 7·75	9·52	11·71	13·54
74	13·34	12·06 / 10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24 / 13·02	14·08	14·52
75	11·22	9·67	8·30 / 7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48 / 14·44	13·62
76	8·78	7·20	6·06	5·92 / 6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20
77	5·72	5·38	6·17	7·82	10·00 / 12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97
78	5·82	7·83	10·50	13·30	15·60	16·72 / 16·28	14·37	11·37	8·36	6·00	4·67	4·80
79	11·14	14·15	16·35	17·15	16·24	13·58	10·14 / 7·06	4·83	3·96	4·70	6·72	9·92
80	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24 / 7·57	11·00	14·10	16·43
81	16·46 / 13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74 / 16·66	17·13	15·64
82	8·56	5·84 / 4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74 / 11·68	8·84
83	4·22	4·76	6·40 / 8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32 / 7·28
84	7·85	9·97	12·30	14·30	15·48 / 15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24
85	12·64	14·05	14·67	14·27	12·97	11·44 / 10·04	9·16	8·84	9·16	9·84	10·95	11·96
86	13·80	13·26	12·13	10·96	10·04	9·60	9·33 / 9·54	9·90	10·56	11·44	11·92	12·05
87	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36 / 10·81	11·14	11·27	10·92	10·30
88	11·34 / 10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12 / 11·02	10·62	10·00	9·22
89	9·62	8·94 / 8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50 / 9·40	8·46	7·84
90	7·82	8·36	9·47 / 10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40 / 7·47	8·26
91	9·62	11·52	13·00	13·97 / 14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72 / 11·72
92	14·02	15·18	15·06	13·40	10·95 / 8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55
93	15·32	13·00	9·88	7·34	5·76	5·40 / 6·24	8·22	10·70	13·40	15·52	16·25	15·36
94	9·44	6·81	5·47	5·38	6·52	8·91	11·80 / 14·40	15·97	16·08	14·35	11·30	7·80
95	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82 / 13·44	9·74	6·67	4·03	2·50
96	6·50 / 8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24 / 3·17	2·56	3·47	5·74
97	12·00	14·47 / 15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67 / 9·40	12·47
98	15·02	14·50	12·53 / 9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57 / 15·77

Day	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
67	16·00	16·06	14·53	11·64	8·54	5·76	4·22 / 3·97	5·24	7·30	10·10	13·02	15·04	75 23
68	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33 / 11·52	14·30	16·06	16·52	15·06	77 2
69	8·47 / 5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25 / 14·26	10·83	8·00	78 5
70	3·54	3·76 / 5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64 / 6·12	6·08	79 8
71	6·06	8·47	11·31 / 13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93 / 9·67	80 11
72	11·88	13·90	15·36	15·50 / 14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	81 13
73	14·73	14·90	14·06	12·63	11·05	9·70 / 8·86	8·72	9·12	10·24	11·76	13·06	13·60	82 16
74	14·22	13·04	11·70	10·34	9·24	8·84	9·04 / 9·84	10·96	12·05	12·86	12·96	12·44	83 19
75	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26 / 12·36	12·92	12·78	11·94	10·50	84 22
76	9·88 / 8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06 / 13·37	11·72	9·38	7·17	86 1
77	5·74	5·63 / 6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44 / 6·93	5·38	5·00	87 4
78	6·40	9·20	12·06 / 14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86 / 5·87	8·10	88 7
79	13·20	15·64	17·04	16·75 / 14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61 / 15·44	89 10
80	17·34	16·56	14·28	10·82	7·84 / 5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	90 12
81	12·86	9·53	7·16	5·81	5·93	7·22 / 9·26	12·02	14·66	16·44	16·67	15·06	12·02	91 15
82	7·02	6·48	7·04	8·26	10·50	13·00	14·94 / 15·83	15·12	12·94	9·87	7·14	5·16	92 18
83	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34 / 8·76	6·67	5·40	5·22	6·16	93 21
84	10·52 / 12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74 / 6·22	7·44	9·20	10·85	95 0
85	12·80	12·96 / 12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54 / 10·90	12·34	13·52	96 3
86	11·54	10·36	9·16 / 8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98 / 12·60	97 6
87	9·34	8·36	7·74	7·58 / 7·98	8·76	9·87	11·04	11·96	12·50	12·66	12·42	11·96	98 8
88	8·40	8·01	8·13	8·63	9·70 / 10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	99 11
89	7·76	8·43	9·46	10·86	12·30	13·36 / 13·82	13·66	12·66	11·42	10·02	8·72	7·96	100 14
90	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96 / 8·88	7·46	6·81	6·84	7·92	101 17
91	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58 / 6·14	7·76	9·84	12·16	102 20
92	15·72 / 15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54 / 13·27	15·36	16·20	103 23
93	12·80	9·46 / 6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72 / 15·47	12·68	105 2
94	4·97	2·93	2·46	3·76 / 6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36 / 6·14	106 5
95	2·77	4·44	7·50	10·96	14·33 / 16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	107 7
96	8·64	12·02	15·12	16·94	17·54	16·24 / 13·40	10·32	7·62	6·17	6·07	7·04	9·13	108 10
97	15·00	16·74	16·94	15·60	13·03	10·01	7·87 / 6·76	6·80	7·71	9·70	12·14	14·15	109 13
98	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83 / 9·54	11·58	13·16	13·74	13·28	110 16

99	11·76	9·56	7·60	5·96 4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76 12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36 12·96	12·72	11·58	10·14	111 19
100	8·48	6·94	6·06	5·96	6·60 7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10 8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10 10·96	9·47	8·14	112 22
101	7·03	6·54	6·88	7·94	9·57	11·42	13·00 14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96 7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87 7·52	6·74	114 1
102	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30 12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04 12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62	6·47 7·28	115 4
103	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74 5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94 13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	116 6
104	11·22 13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74 6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	8·80 6·96	6·07	6·34	7·48	9·44	11·96	14·10	117 9
105	15·48	15·44	13·84 10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94 15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97	6·54 7·98	10·16	12·70	14·64	15·66	14·96	118 12
106	12·70	9·46	6·57	4·32 3·42	4·04	5·80	8·48	11·42	14·32	16·17	16·57	15·46 12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45 15·07	15·35	13·81	11·00	7·70	119 15
107	5·15	3·44	3·36	4·67	6·96 9·52	12·56	14·92	16·36	16·28	14·70	11·93	9·06	7·20 6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73 7·17	4·24	3·42	120 18
108	4·04	5·68	8·27	10·68	13·46	15·48 16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34 10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86 4·88	6·80	121 21
109	9·18	11·76	14·24	15·56	15·54	14·30	11·86 9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96 13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36 12·80	123 0
110	14·56	15·43	14·76	13·04	10·84	8·96	7·76	7·44 7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28 6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	124 2
111	14·86 13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62 11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12 8·46	10·24	12·10	13·38	14·08	13·92	12·90	125 5
112	11·41	10·00 8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68 10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10 13·34	13·78	13·40	12·16	10·87	9·94	126 8
113	9·24	8·96	8·94 9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46 7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54	13·24 12·12	10·96	9·98	9·27	8·94	127 11
114	8·74	8·80	9·24	10·03 10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56 9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96 8·96	8·20	7·92	8·00	128 14
115	8·62	9·56	10·46	11·34	11·77 11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30 13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90 7·45	8·52	10·00	129 17
116	11·40	12·36	12·92	12·66	11·62	10·20 8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54 12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20 12·12	13·50	130 20
117	14·22	13·67	12·20	10·16	8·55	7·53	7·27 7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60 5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34 14·46	131 23
118	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66 14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53 6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	133 1
119	9·36 7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76 10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00 15·72	17·16	16·96	15·18	11·90	8·78	6·57	134 4
120	5·95	6·52 7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17 1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06 14·58	10·90	8·02	5·94	5·46	6·30	135 7
121	8·25	10·90	13·74 15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03 8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60 5·84	5·52	6·20	8·20	11·20	136 10
122	14·02	15·72	15·74	13·76	10·48 6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14 17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58 8·80	11·97	14·34	15·47	137 13
123	15·07	12·82	9·66	6·56	4·08	2·67 2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40 12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06	14·14 14·98	14·36	12·18	138 16
124	9·28	6·58	4·76	3·86	4·30	5·66	7·78 10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54 6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36 7·30	139 19
125	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66 15·72	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44 8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	140 21
126	6·28 6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52 11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12 12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	142 0
127	7·36	8·54 10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48 6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65 11·60	10·06	8·56	7·47	7·24	7·70	8·44	143 3
128	10·00	11·62	13·06 13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56 6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02 7·47	7·63	8·26	9·76	11·56	144 6
129	13·14	14·05	13·96	12·62 10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66 13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44 10·16	11·93	13·46	14·20	145 9
130	13·97	12·62	10·50	7·84	5·72 4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76 13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66 14·36	13·76	11·92	146 12
131	9·27	6·82	4·82	3·97	4·57	6·16 8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60 7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66 7·86	5·58	147 15
132	4·22	4·13	5·24	7·24	9·70	12·30	14·40 15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70 11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94 4·50	148 18
Sum	769·09	740·33	773·60	721·18	740·99	745·29	768·76	735·74	742·12	749·25	764·15	771·41	788·42	756·35	763·27	769·01	749·10	775·62	761·21	780·98	756·62	792·66	743·04	765·72	No. of Days.
No.	74	73	75	73	75	74	75	72	74	73	75	73	75	74	74	75	72	74	73	75	73	75	73	75	$73^d\ 22^h$. 18223·91

FORMS FOR SHORT-PERIOD TIDES.

SERIES Q.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
133	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90 / 11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27 / 13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	149 20
134	9·70 / 13·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54 / 7·34	8·10	9·52	11·55	13·36	14·27	13·92	12·06	9·48	6·90 / 5·12	4·32	4·97	6·54	8·70	11·00	13·46	150 23
135	15·32	16·07 / 15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26 / 13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84 / 7·60	9·46	11·87	14·10	15·30	15·60	152 2
136	14·66	12·78	10·74 / 9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96 / 9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74 / 14·30	15·12	15·06	13·65	11·84	153 5
137	10·00	8·46	7·75	7·78 / 8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03 / 5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22 / 12·62	11·08	9·47	8·38	154 8
138	8·08	8·30	9·20	10·24	11·40 / 12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83 / 10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20 / 8·47	8·28	8·60	155 11
139	9·36	10·36	11·26	11·83	12·05	11·56	10·60 / 9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	13·94 / 14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46 / 9·23	10·10	156 14
140	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32 / 8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88 / 11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·29 / 12·14	157 17
141	12·58	13·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37 / 11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74 / 7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	158 19
142	13·86	13·28 / 12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67 / 15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19 / 9·46	11·28	13·22	14·76	15·82	15·76	14·97	159 22
143	13·34	11·70	10·67 / 10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17 / 12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77 / 15·84	16·86	16·85	15·70	13·60	11·52	161 1
144	9·95	9·55	9·80	10·84 / 12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16 / 4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17 / 15·60	12·50	10·07	8·34	8·17	162 4
145	8·96	10·27	12·23	14·24	15·74 / 16·29	15·33	12·77	9·46	6·32	4·44	3·62	4·30	6·30 / 8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44 / 7·22	7·81	9·55	163 7
146	12·08	14·54	16·07	16·21	14·76	11·87 / 8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92 / 18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65 / 12·45	14·89	164 10
147	16·40	16·14	14·28	10·90	7·10	4·31	2·62 / 2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00 / 13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42 / 15·96	165 13
148	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11 / 10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05 / 5·72	5·77	7·00	9·56	12·80	15·12	16·05	15·26	12·76	166 15
149	9·20 / 6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44 / 17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07 / 13·02	14·92	15·57	14·68	12·28	9·20	6·52	167 18
150	4·77	4·20 / 4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54 / 11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85 / 14·05	11·96	9·47	7·26	6·06	5·80	168 21
151	6·39	7·66	9·64 / 11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86 / 6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34 / 8·60	7·57	7·26	7·62	8·44	170 0
152	9·92	12·12	14·20	15·46 / 15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32 / 11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31 / 8·49	9·03	10·30	12·04	171 3
153	13·70	14·74	14·75	13·73	12·02 / 10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20 / 13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33 / 11·90	13·24	14·06	172 6
154	14·10	13·34	11·84	10·05	8·26	6·94 / 6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46 / 11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82 / 13·85	13·08	173 9
155	11·64	9·76	8·00	6·70	6·08	6·22	7·28 / 9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14 / 8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00 / 8·85	174 12
156	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45 / 14·84	13·95	12·40	10·90	9·46	8·62	8·24	8·56	9·64 / 11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	175 14
157	4·94 / 4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77	12·06 / 10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37 / 13·05	11·52	9·17	6·76	5·11	4·16	4·64	176 17
158	6·10	8·00 / 10·50	12·90	14·56	15·33	14·70	13·32	11·14	9·44	8·17	7·54 / 7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97 / 5·83	4·38	4·04	4·96	6·82	9·02	177 20
159	11·57	13·86	15·24	15·44 / 14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67 / 12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22 / 5·70	7·84	10·40	12·82	14·74	178 23
160	15·56	15·33	13·80	11·44	9·35 / 7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00 / 10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37 / 13·67	15·12	15·46	14·48	180 2
161	12·44	9·96	8·16	6·86	6·42	6·94 / 8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96 / 3·98	4·36	5·65	7·72	10·02	12·26	14·31	15·28	15·12 / 13·77	11·30	9·01	181 5
162	7·37	6·64	6·56	7·46	9·06	11·01	12·70 / 13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94 / 8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74 / 6·51	182 8
163	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72 / 7·36	5·70	5·02	5·24	6·42	8·07	10·12	11·98	13·73 / 14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	183 10
164	8·72 / 10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87 / 6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20	12·50 / 10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	184 13

165	12·19	12·66 12·22	10·84	9·25	7·90	6·96	6·92	7·56	8·50	10·00 11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94 6·56	6·92	7·79	9·26	10·80	11·92	12·43	185 16
166	12·16	11·12	9·70 8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98 13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16 10·52	11·71	12·36	12·28	11·46	186 19
167	10·38	9·16	8·34	8·14 8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24 8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56 12·86	12·14	11·14	9·86	187 22
168	8·86	8·32	8·34	9·02	10·46 11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74 5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10 10·48	9·04	8·28	189 1
169	8·37	8·98	10·28	11·72	13·02	13·62 13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62 10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68 7·62	8·40	190 4
170	10·00	11·70	13·12	13·97	13·69	12·32	10·27 7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54 16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54 11·60	191 7
171	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56 2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27 10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	192 9
172	15·05 14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20 9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24 5·54	6·76	9·24	12·48	14·76	16·12	15·46	193 12
173	13·17	9·32 5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22 17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72 13·12	15·46	16·44	15·54	12·76	8·60	194 15
174	5·17	2·76	1·62 2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14 7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37 15·10	12·10	8·47	5·36	3·22	195 18
175	2·47	3·46	5·71	8·66 12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26 5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45 5·84	4·20	3·82	5·12	196 21
176	6·97	9·80	13·00	15·56	17·04	17·17 15·44	12·60	9·26	6·86	5·22	4·84	5·76	8·06	10·85 13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54 6·64	7·95	10·24	198 0
177	12·80	15·30	16·34	15·86	14·11	11·28	8·50 6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44 12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11 13·10	14·71	199 3
178	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05 6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16 9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07 13·40	200 6
179	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82 11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14 9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	201 8
180	9·77	8·47 7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02 12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73 11·74	12·78	13·04	12·50	11·42	10·20	8·76	202 11
181	7·52	6·90	6·76 7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22 11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94 12·66	11·70	10·10	8·56	7·16	6·24	203 14
182	6·28	7·14	8·62	10·44 12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94 8·94	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36 7·66	6·38	5·86	6·06	7·07	204 17
183	8·94	10·96	13·07	14·58	15·07 14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36 11·74	13·14	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10 7·65	9·76	12·02	205 20
184	14·00	15·20	15·33	14·58	12·97	11·01 9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	13·92 12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96 14·83	16·05	206 23
185	15·68	14·35	12·14	9·94	8·56	8·04	8·20 8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50 5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15 13·18	208 2
186	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83 14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20 10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	209 4
187	7·58 6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37 9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96 16·14	15·17	12·96	10·25	8·01	6·67	6·34	210 7
188	6·89	8·16 10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76 5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47 8·96	7·02	6·16	6·33	7·34	9·23	211 10
189	11·44	13·54	14·58 14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76 13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77 6·54	7·96	9·86	12·04	13·74	212 13
190	14·37	13·56	11·51	8·97 7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26 13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54 12·48	13·67	13·96	12·84	213 16
191	10·98	9·00	7·60	6·88	7·24 8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27 6·67	6·12	6·40	7·34	8·74	10·52	12·26	13·26	13·32 12·36	10·84	9·38	214 19
192	8·24	7·77	8·12	8·86	10·16	11·76 13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50 7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24 9·16	8·76	215 22
193	9·04	9·66	10·72	12·02	13·24	14·10	14·04 13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52 12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35 9·67	217 1
194	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	7·86 6·50	5·94	6·16	7·10	8·50	10·20	11·94	13·44	14·14 14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	218 3
195	11·33 12·62	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46 6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94 10·78	9·16	8·56	8·76	9·78	11·16	12·57	219 6
196	13·70	14·26 14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32 13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60 7·78	8·76	10·54	12·56	14·24	15·18	220 9
197	14·86	13·21	10·40	7·41 4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54 17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22 12·92	15·15	16·26	15·72	13·66	221 12
198	10·33	6·96	4·40	3·04	3·33 5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38 8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04 16·38	13·96	10·25	6·47	222 15
Sum	764·31	787·43	750·82	777·22	768·42	755·54	742·48	728·93	770·21	759·73	787·09	779·64	772·88	772·18	780·18	771·08	776·86	776·52	774·13	790·96	779·33	775·94	776·29	792·73	No. of Days.
No.	73	75	73	75	74	73	74	73	75	73	74	74	75	73	74	73	74	75	74	75	73	74	73	74	73d 21h. 18510·90

FORMS FOR SHORT-PERIOD TIDES.

SERIES Q.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
199	3·74	2·56	3·20	5·12	8·18	11·74 15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48 5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	9·20 5·80	3·36	2·56	223 18
200	3·60	5·73	9·03	12·78	15·94	17·78	18·04 16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10 14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	4·58 7·04	224 21
201	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22 5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06 14·38	11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	225 23
202	13·96 16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64 6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94 6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	227 2
203	15·72	14·46 12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87 13·60	14·46	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26 10·72	12·27	13·74	14·47	14·18	12·78	228 5
204	10·82	8·78	6·78 5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85 11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88 13·72	13·38	11·88	10·06	8·17	229 8
205	7·02	6·68	7·00	7·70 8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62 10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23 9·96	8·64	7·77	7·46	230 11
206	7·69	8·30	9·04	10·10	11·17 12·34	12·90	13·90	12·34	11·72	11·15	10·62	10·30	10·00 10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35 7·66	7·57	8·12	231 14
207	9·06	10·48	11·57	12·72	13·42	13·56 13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62 12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70 8·54	9·82	232 17
208	11·43	12·72	13·64	13·66	13·26	12·36	11·22 10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85 10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94 13·38	233 20
209	14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84 9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86 6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	234 22
210	14·84 13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56 13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80 9·76	11·70	13·66	15·10	15·46	14·62	12·86	236 1
211	10·57	8·64 7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00 8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02 15·96	15·50	14·08	11·60	8·97	7·34	237 4
212	6·70	6·84	7·80 9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97 5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08 10·11	7·72	6·36	6·10	6·94	238 7
213	8·63	10·83	13·20	15·21 15·71	14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64 13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46 5·74	7·13	9·22	11·84	239 10
214	14·56	15·71	15·48	13·64	10·66	7·60 5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56 15·34	12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28 13·04	15·14	15·90	240 13
215	14·88	12·52	9·63	7·07	5·74	5·64	6·67 8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16 6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38 14·00	11·50	241 16
216	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80 15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64 7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64 7·30	242 19
217	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64 11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96 13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	243 21
218	8·36	9·26 10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06	6·46 5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44 12·44	11·04	9·83	8·84	8·57	8·87	9·67	245 0
219	10·67	11·96	13·06 13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	7·02 8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73 9·67	9·16	9·18	9·63	10·54	11·48	246 3
220	12·46	12·92	12·66	11·74 10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	10·76 12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14 9·86	10·86	12·02	12·84	247 6
221	12·98	12·36	11·16	9·57	7·60 6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96 14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00 13·14	13·74	13·40	248 9
222	12·04	10·04	7·64	5·76	4·78	5·02 6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96 9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44 12·80	10·18	249 12
223	7·37	5·17	3·90	4·03	5·50	7·96	10·88 13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15 5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29	9·94	6·63 4·34	250 15
224	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44 16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28 15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	251 17
225	3·72 5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	8·56 5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47 12·37	8·44	5·52	3·48	3·10	4·46	6·74	252 20
226	9·94	13·47 16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30 5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	5·38 3·90	4·20	5·52	7·95	11·06	14·30	253 23
227	16·51	17·04	15·88 12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45 15·42	16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04 9·54	12·25	14·81	16·16	16·06	255 2
228	14·44	11·07	7·87	5·34 3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66 9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58 15·36	14·73	12·52	9·86	256 5
229	7·17	5·31	4·44	5·02	6·44 8·50	11·04	13·56	14·79	14·77	13·46	11·46	9·44	8·00	7·36 7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02 8·73	6·90	5·70	257 8
230	5·63	6·34	7·60	9·36	11·36	13·14 13·88	13·60	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95 10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44 6·67	7·34	258 11

231	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60 9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62 11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66 9·84	259 14
232	10·90	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60 9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74 9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	260 16
233	11·52 11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38 10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74 7·42	7·64	8·34	9·42	10·67	11·65	12·46	261 19
234	12·82	12·62 12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23 11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74 9·24	10·86	12·34	13·24	13·55	13·17	262 22
235	12·08	10·64	9·21	8·06 7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17 9·62	7·86	6·55	6·10	6·54	7·88	9·68	11·56	13·16 14·03	14·06	13·18	11·60	9·86	264 1
236	8·07	6·97	6·64	7·14	8·38 10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75 5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87 10·73	8·45	6·71	5·90	265 4
237	6·17	7·29	9·02	11·07	13·02	14·14 14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06 11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74 5·30	6·12	7·84	266 7
238	9·97	12·54	14·50	15·33	14·46	12·23	9·34 6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76 15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24 13·97	267 10
239	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22 6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06 6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	268 12
240	15·80 13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74 14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83 5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	269 15
241	9·34	6·97 5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86 12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84 16·21	15·96	14·09	11·42	8·56	6·75	270 18
242	5·80	6·17	7·42 9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42 3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24 10·76	8·47	7·04	6·68	7·20	271 21
243	8·44	10·38	12·56	14·16 14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87 7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87 7·56	7·92	8·94	10·67	273 0
244	12·44	13·74	13·97	12·81	10·83 8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86 14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40 10·68	12·08	13·04	274 3
245	13·08	11·93	10·54	9·05	7·64	6·61 6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66 11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30 12·61	12·14	275 6
246	11·16	9·92	8·44	7·14	6·37	6·38	7·34 8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72 8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98 11·16	276 9
247	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56 13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46 8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	277 11
248	8·58 6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54 13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66 14·44	15·38	15·04	13·48	11·07	8·36	6·38	278 14
249	5·47	5·87 7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50 5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30 14·16	10·84	7·77	5·85	5·07	5·66	279 17
250	7·50	9·87	12·74 15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28 7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20 5·47	4·98	5·96	7·74	10·58	280 20
251	13·66	16·26	17·40	16·86 14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47 17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54 8·77	11·76	14·62	16·82	281 23
252	17·12	15·72	12·71	9·14	6·06	3·77 3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06 11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12 16·37	16·06	14·21	283 2
253	11·04	7·42	4·80	3·12	3·62	5·50	8·04 11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24 6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93 8·64	6·01	284 5
254	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24 16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30 11·26	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44 4·58	285 8
255	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14 9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64 13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	286 10
256	9·04	10·97 13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24 8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37 7·08	6·36	6·44	7·32	8·34	9·60	11·24	287 13
257	12·72	13·46	13·28 12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14 11·01	11·52	11·46	10·73	9·52	8·47	7·66	7·41	7·56 8·04	8·76	9·91	11·17	12·30	12·88	288 16
258	12·66	11·92	11·04	10·37 9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66 10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16 12·02	12·40	12·34	12·06	289 19
259	11·48	10·82	9·97	9·24	8·77 8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03 9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58 12·54	12·07	11·12	290 22
260	9·97	8·90	8·23	8·12	8·56	9·27 10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56 7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77 9·14	7·88	292 1
261	7·18	7·36	8·12	9·26	10·62	11·94	12·78 12·88	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02 11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50 6·88	293 4
262	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52 8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48 13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	294 6
263	10·30 12·80	14·34	15·00	14·16	12·26	9·96	7·92	6·50	6·22 7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47 5·46	4·56	4·96	6·60	9·03	11·80	14·15	295 9
264	15·84	15·96 14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93 14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14 7·32	10·15	13·10	15·67	16·78	16·36	296 12
Sum	750·39	773·17	758·51	768·46	732·67	767·55	771·09	785·69	755·65	758·63	752·33	740·08	780·04	756·52	779·19	758·40	775·27	752·88	772·08	740·38	751·69	766·59	746·32	748·12	No. of Days.
No.	73	75	73	74	72	75	74	75	74	74	74	73	74	73	75	73	75	73	75	72	74	75	73	75	73d 21h. 18241·70

FORMS FOR SHORT-PERIOD TIDES.

Series Q.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
265	14·16	11·00	8·32 / 6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28 / 9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60 / 16·81	17·35	16·28	13·64	10·44	297 15
266	7·71	6·07	5·84	6·88 / 8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46 / 2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72 / 12·68	9·66	7·28	5·94	298 18
267	6·04	7·36	9·64	12·45	14·84 / 16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47 / 10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76 / 5·94	6·28	7·70	299 21
268	9·92	12·68	14·78	15·58	14·78	12·36 / 9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17 / 16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46 / 10·56	13·14	301 0
269	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22 / 5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26 / 10·86	8·86	7·58	7·14	7·44	8·84	10·92	12·84	13·84 / 13·86	302 3
270	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36 / 11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12 / 7·64	7·92	8·94	10·40	11·85	12·91	13·12	12·26	303 5
271	10·75 / 9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46 / 14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40 / 9·60	10·88	12·06	12·64	12·40	11·47	10·10	304 8
272	8·76	7·68 / 7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	13·04 / 11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48 / 12·55	12·87	12·46	11·36	9·70	8·28	305 11
273	7·14	6·80	7·40	8·84 / 10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53 / 6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66 / 12·30	10·26	8·61	7·37	6·86	306 14
274	7·24	8·35	10·36	12·50	14·13 / 15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	5·86 / 7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56 / 7·12	6·44	6·77	8·02	307 17
275	10·14	12·62	14·56	15·55	15·25	13·56 / 10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60 / 15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24 / 10·85	13·27	308 20
276	15·16	15·84	15·03	12·98	9·78	7·04	4·71 / 3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38 / 12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	15·52 / 15·84	309 23
277	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50 / 9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26 / 6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	311 1
278	10·15 / 7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38 / 17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00 / 10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	312 4
279	3·69	2·94 / 3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66 / 10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	14·50	14·36 / 12·66	9·94	7·20	4·97	3·56	3·77	313 7
280	5·34	7·72	10·56 / 13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86 / 6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52 / 4·86	4·33	5·20	6·90	9·14	314 10
281	11·80	14·20	15·72	15·81 / 14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68 / 12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66 / 8·34	10·52	12·80	14·44	315 13
282	15·18	14·68	13·32	11·56	10·02 / 8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23 / 11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91 / 14·18	14·40	13·64	316 16
283	12·37	10·90	9·58	8·78	8·46	8·68 / 9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18 / 7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96 / 11·72	10·53	317 19
284	9·66	9·14	8·92	8·96	9·17	9·66	10·40 / 11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44 / 10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	9·76 / 9·04	318 22
285	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32 / 11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48 / 13·10	13·15	12·64	11·84	10·76	9·71	8·88	8·35	320 0
286	8·19 / 8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08 / 8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84 / 11·84	10·56	9·24	8·13	7·50	7·43	7·86	321 3
287	8·83	10·03 / 11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96 / 10·02	11·20	12·46	13·23	13·47	13·00	11·72	10·14	8·38 / 7·03	6·27	6·31	7·08	8·52	10·23	322 6
288	11·92	13·17	13·63 / 13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14 / 13·94	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46 / 6·76	8·80	11·15	13·20	14·66	323 9
289	14·98	13·87	11·76	9·58 / 8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87 / 10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02 / 14·40	15·66	15·44	13·71	324 12
290	11·16	8·74	7·02	6·40	6·78	8·22 / 10·37	12·25	13·88	14·74	14·20	12·26	9·36	6·51	4·12 / 2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90 / 13·76	10·86	8·17	325 15
291	6·45	5·84	6·36	8·12	10·44	12·84	14·46 / 15·08	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74 / 7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26 / 5·65	5·46	326 18
292	6·44	8·40	11·20	13·57	15·11	15·17	13·27	9·96 / 6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66 / 17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88 / 9·32	327 21
293	12·22	14·44	15·50	14·80	12·31	8·84	5·46	3·00	1·66 / 2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56 / 11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	328 23
294	14·67	15·26 / 14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96 / 11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16 / 5·50	5·88	7·64	10·25	12·77	14·29	14·72	330 2
295	13·33	10·74	7·81 / 5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33 / 16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94 / 10·30	12·38	13·76	13·96	12·68	10·56	331 5
296	8·18	6·28	4·97	4·83 / 5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28 / 9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16 / 12·24	10·73	8·96	7·30	332 8
297	6·24	5·96	6·50	7·80	9·84 / 12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86 / 6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14 / 8·60	7·52	7·06	333 11

298	7·44	8·47	10·17	11·91	13·34	14·21 14·40	13·72	12·30	10·42	8·41	6·86	6·14	6·37	7·32 8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84 7·88	8·64	334 14
299	10·02	11·65	13·16	14·14	14·30	13·64	12·17 10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07 13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72 11·26	335 17
300	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00 5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58 10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	336 19
301	13·98 14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57 8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82 7·54	8·05	9·36	11·14	12·94	14·20	14·46	337 22
302	13·36	11·28 8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54 16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77 11·52	13·36	14·60	14·56	12·94	10·26	339 1
303	7·33	5·11	3·87 4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20 9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76 14·17	12·16	8·93	6·32	4·31	340 4
304	3·72	4·64	6·56	9·06 11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36 7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77 5·58	4·12	4·16	5·63	341 7
305	7·85	10·36	13·16	15·34	16·56 16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91 13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91 6·70	9·02	11·70	342 10
306	14·07	15·87	16·56	15·80	13·96	11·44 9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24 10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88 15·05	16·23	343 13
307	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17 9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64 5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18 13·58	344 16
308	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67 13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43 10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	345 18
309	8·66 7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47 8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86 14·46	14·06	12·87	11·31	9·72	8·40	7·76	346 21
310	7·73	8·27 9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56 8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50 10·98	9·76	8·76	8·24	8·24	8·80	348 0
311	9·62	10·53	11·27	11·70 11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70 12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30 7·83	8·04	8·58	9·36	10·22	349 3
312	11·00	11·54	11·74	11·57	10·96 10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57 13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86 8·85	10·11	11·13	11·95	350 6
313	12·42	12·30	11·78	10·77	9·72	9·06 9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22 9·78	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90 13·50	13·36	351 9
314	12·36	10·92	9·68	8·84	8·68	9·14	10·18 11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75 4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76 10·77	352 12
315	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42 13·45	12·54	10·80	8·50	6·30	4·47	3·64	4·12	5·82 8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	353 14
316	7·50 7·36	8·16	9·80	11·80	13·38	14·33	14·26	13·00	10·50 7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97 16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	354 17
317	8·06	10·00 12·15	14·04	15·14	15·03	13·10	10·20	7·00	4·27	2·40 2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57 9·74	7·27	6·14	6·36	7·56	9·86	355 20
318	12·72	14·77	15·81 15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06 10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67 6·00	7·50	10·14	13·10	15·24	356 23
319	16·17	14·94	12·16	8·55 5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66 18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63 13·44	15·46	15·86	14·14	358 2
320	10·98	7·68	4·48	2·36	1·77 3·30	5·83	8·90	12·30	15·56	17·50	17·88	16·62	13·58	9·97 6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32 13·24	9·92	6·64	359 5
321	4·73	3·07	3·08	4·74	6·97	9·86 13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90 5·87	8·03	10·96	13·30	14·68	14·83	13·24	10·55	7·68 5·43	4·33	360 8
322	4·63	5·97	8·02	10·57	13·25	15·58	16·60 16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	8·60	10·76 12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14 7·14	361 11
323	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86 8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10 12·28	10·74	9·22	7·96	7·33	7·28	7·93	9·16	362 13
324	10·97 13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70 6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24 9·12	8·42	8·24	8·54	9·54	11·12	12·64	363 16
325	13·57	13·57 12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94 10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	8·58 8·66	9·44	10·68	11·96	12·92	13·14	364 19
326	12·66	11·54	10·06 8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68 13·81	12·94	11·57	10·28	9·14	8·62	8·63	9·20	10·44 11·66	12·53	12·92	12·58	11·64	365 22
327	9·77	7·86	6·12	5·05 4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78 10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08 12·90	11·65	9·64	7·34	367 1
328	5·52	4·45	4·52	5·76	7·66	9·97 12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24 8·26	8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91 6·66	4·96	4·33	368 4
329	4·86	6·36	8·55	11·00	13·44	15·21	15·84 15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56 12·24	13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11 5·34	7·23	369 7
330	9·78	12·44	14·65	15·93	15·94	14·74	12·37	10·23 8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	14·00 12·18	9·43	6·77	4·83	3·98	4·52	6·17	8·54	11·10 13·61	370 10
331	15·49	16·36	15·78	13·85	11·34	9·14	7·57	7·01	7·14 8·33	10·10	12·14	13·77	14·42	13·51	11·13	8·22	5·94	...	...	...	...	...	...	...	371 4
Sum	750·90	757·95	743·99	755·91	761·36	782·39	766·39	756·46	743·89	757·48	757·41	797·17	756·01	759·53	781·47	777·74	790·50	749·28	770·69	763·27	776·05	744·37	749·23	770·16	No. of Days. 74^d 16^h.
No.	74	75	74	76	74	76	74	76	74	75	74	76	75	75	76	75	75	72	74	74	75	73	75	75	18319·60

FORMS FOR SHORT-PERIOD TIDES.

Bombay—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - \frac{1}{2}\sigma - \frac{1}{2}\varpi)$. Series L. Motion per mean Solar hour = 14°·7642394.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	1 23
2	16·66	15·40	12·16	8·40	4·86	2·56	1·71	2·90 5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	16·63	3 0
3	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	14·87	4 0
4	16·40	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68 9·24	12·28	14·51	5 1
5	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·[illegible]	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67	12·12	6 1
6	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76	7 1
7	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05 14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	8 2
8	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	7·34	8·07	9 2
9	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	10 2
10	7·74	8·96	10·26	11·64 12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	11 3
11.	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	12 3
12	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04 12·84	11·88	10·23	8·20	6·52	5·62	5·56	13 4
13	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66	7·32	5·82	5·14	14 4
14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	10·84	8·24	6·20	4·76	15 4
15	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56 12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	16 5
16	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	17 5
17	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48	5·34 4·30	18 6
18	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	19 6
19	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	20 6
20	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54 5·64	6·83	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	21 7
21	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	22 7
22	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	23 7
23	9·07	8·15	8·14	8·68	9·86 11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	24 8
24	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	25 8
25	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78 8·55	10·33	12·22	13·56	14·30	14·16	26 9
26	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	27 9
27	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	28 9
28	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11 12·97	14·55	15·08	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	29 10
29	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	30 10
30	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	31 10
31	17·01 18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	32 11
32	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	33 11
33	15·86	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43 15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	34 12
34	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	35 12
35	14·24	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	36 12

36	12·08	13·76	14·66	14·44	13·11	11·12 9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	37 13
37	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	38 13
38	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12 10·57	10·07	9·70	9·70	39 14
39	10·13	10·80	11·27	11·45	11·25	10·76	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	40 14
40	9·17	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	41 14
41	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36 6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	42 15
42	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	43 15
43	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	44 15
44	7·54	6·79 7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	45 16
45	6·24	5·96	6·74	8·48	10·85	13·07	14·56	14·85	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	46 16
46	6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50	15·15	13·08	9·90	6·94	4·75	3·92	4·66	6·62 9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	47 17
47	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	48 17
48	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	49 17
49	6·28	4·54	4·14	5·07	7·06	9·74	12·44 14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	50 18
50	5·62	4·54	4·69	5·80	7·87	10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	51 18
51	6·90	5·18	4·58	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12 12·82	10·83	8·73	52 19
52	6·87	5·45	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	53 19
53	8·57	6·98	5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	54 19
54	10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16 13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	12·26	55 20
55	11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	56 20
56	13·52	12·60	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	57 20
57	14·40	14·74	13·76 11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	58 21
58	15·38	15·86	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	59 21
59	14·74	16·46	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20 6·96	4·47	3·56	4·02	6·04	9·40	12·86	60 22
60	15·55	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	61 22
61	13·76	15·97	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	62 22
62	11·55	14·34	16·02	16·28	14·66	11·66	8·60	6·46 5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	63 23
63	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	64 23
64	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34 7·46	9·00	66 0
65	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	67 0
66	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50	68 0
67	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22 10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	69 1
68	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	70 1
69	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	71 1
70	6·74	6·70	7·63	8·94 10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	9·92	8·17	6·67	72 2
71	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	7·27	73 2
72	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96 14·26	14·55	13·37	11·16	8·45	6·26	74 3
73	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	75 3
Sum	767·45	775·49	790·38	795·81	775·44	765·23	765·55	762·71	764·99	758·26	754·06	771·84	800·60	796·45	810·02	790·80	763·78	766·14	754·45	725·41	726·65	726·90	711·50	720·83	No. of Days. 74^d 4^h.
No.	74	74	74	75	74	74	74	75	74	74	74	74	75	74	74	74	73	75	75	73	74	75	74	74	18340·74

SERIES L.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	d h
74	5·44	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	76 3
75	6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73 16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	77 4
76	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83	78 4
77	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36 10·24	79 5
78	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	80 5
79	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	81 5
80	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76 5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	82 6
81	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	83 6
82	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	84 6
83	14·48	14·44	13·62	12·12	10·36 8·96	8·11	7·96	8·44	9·76	11·26	12·36	12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	85 7
84	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	86 7
85	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	6·93	5·38 5·00	5·82	7·83	10·50	13·30	87 8
86	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	88 8
87	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	89 8
88	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25 5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	90 9
89	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	91 9
90	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	92 9
91	10·50 13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	93 10
92	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	94 10
93	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05 14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	95 11
94	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54	96 11
95	9·90	10·56	11·44	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	97 11
96	9·87	10·02	10·36	10·81	11·14	11·27 10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	98 12
97	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	99 12
98	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66 12·66	11·42	10·02	8·72	100 13
99	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	101 13
100	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	102 13
101	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95 8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	103 14
102	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	104 14
103	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	105 14
104	7·80	4·07 2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	106 15
105	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	107 15
106	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	6·07 7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	108 16
107	7·44	4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	109 16
108	9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	110 16

109	11·76	9·56	7·60	5·96	4·93	5·02	5·86 7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	111 17
110	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	112 17
111	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85 9·40	10·96	12·36	113 18
112	13·06	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	114 18
113	12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	115 18
114	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22 13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	116 19
115	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	117 19
116	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	118 19
117	8·48	11·42	14·32 16·17	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	119 20
118	9·52	12·56	14·92	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	120 20
119	8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26 10·82	7·87	5·57	3·94	3·86	4·88	6·80	121 21
120	9·18	11·76	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	122 21
121	8·22	10·36	12·80	14·56	15·43	14·76	13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	123 21
122	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14 8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12	124 22
123	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	125 22
124	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46	7·76 7·66	7·97	126 23
125	8·66	9·74	10·97	12·22	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	127 23
126	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	128 23
127	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26 6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	130 0
128	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	12·12	13·50	14·22	13·67	12·20	10·16	131 0
129	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	132 0
130	10·01	8·14	6·95	6·90 8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	133 1
131	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	134 1
132	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22 10·62	13·96	16·50	17·69	17·06	14·58	135 2
133	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	136 2
134	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	137 2
135	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34 15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	138 3
136	15·40	12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	139 3
137	16·23	14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66 15·72	140 4
138	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	141 4
139	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	142 4
140	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86 12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	143 5
141	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	144 5
142	11·56	13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	145 5
143	10·16	11·93	13·46	14·20	13·97	12·62 10·50	7·84	5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	146 6
144	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	147 6
145	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14 9·74	8·36	7·64	7·54	8·20	148 7
146	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74	149 7
Sum	781·94	769·25	781·62	775·65	772·92	774·30	748·58	741·30	772·33	772·27	753·41	752·06	743·78	734·36	748·64	748·56	742·33	743·79	738·09	753·74	764·34	776·73	786·00	804·00	No. of Days. 74^d 4^h.
No.	74	74	74	74	74	75	74	73	75	75	73	74	74	74	75	74	74	74	74	75	74	74	74	75	18279·99

FORMS FOR SHORT-PERIOD TIDES.

SERIES L.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
147	8·92	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	150 7
148	8·10	9·52	11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32 4·97	6·54	8·70	11·00	13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	151 8
149	8·74	10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	152 8
150	8·24	9·44	11·07	12·62	13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	153 8
151	7·78 8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	154 9
152	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	155 9
153	8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82	11·10 12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	156 10
154	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	157 10
155	8·20	8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	158 10
156	8·74	7·92	7·54	7·76	8·67	9·96	11·54 12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	159 11
157	8·82	7·82	7·50	8·19	9·46	11·28	13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	12·02	160 11
158	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47 16·06	15·22	13·50	10·84	161 12
159	8·22	6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	162 12
160	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	163 12
161	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53 17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14	14·28	164 13
162	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96	165 13
163	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	16·05	166 13
164	15·26	12·76 9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07	13·02	14·92	15·57	167 14
165	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	168 14
166	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84 8·61	6·86	6·32	6·58	7·80	9·82	12·04	13·55	169 15
167	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32	11·22	170 15
168	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	171 15
169	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60 8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	172 16
170	10·86	12·50	13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	6·70	6·08	6·22	7·28	173 16
171	9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85	7·06	5·67 5·05	5·60	7·15	174 17
172	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	8·62	8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	175 17
173	7·74	9·76	12·14	14·01	15·00	14·86	13·77	12·06	10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	176 17
174	6·10	8·00	10·50	12·90	14·56	15·33	14·70	13·32	11·14	9·44	8·17	7·54	7·57 8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	4·04	4·96	177 18
175	6·82	9·02	11·57	13·86	15·24	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22	178 18
176	5·70	7·84	10·40	12·82	14·74	15·36	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	179 18
177	4·76	6·70	9·02	11·37 13·67	15·12	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	180 19
178	5·65	7·72	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	181 19
179	5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	11·66	12·82 13·10	11·86	9·72	7·36	5·70	5·02	5·24	182 20
180	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	183 20
181	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96	184 20

182	6·92	7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38 11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	185 21
183	7·56	8·14	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	186 21
184	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14 11·14	9·86	187 22
185	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10	188 22
186	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	189 22
187	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	7·76 5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	190 23
188	12·92	10·40	8·23	7·07	6·90	7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	191 23
189	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	15·05	14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	192 23
190	17·55	15·88	12·54	9·04	6·46 5·24	5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	194 0
191	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	195 0
192	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47 3·46	5·71	8·66	12·13	15·36	17·38	196 1
193	17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	197 1
194	17·04	17·17	15·44	12·60	9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	198 1
195	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	6·24 8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	199 2
196	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	200 2
197	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	201 2
198	10·90 12·12	13·14	13·41	12·71	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	202 3
199	10·73	11·74	12·78	13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·23	11·04	10·07	9·54	9·50	203 3
200	9·87	10·64	11·70	12·60	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44 12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	204 4
201	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	205 4
202	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	206 4
203	8·18	8·73	9·62	10·95	12·64	13·76 13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	207 5
204	8·20	8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	208 5
205	7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11 14·47	11·94	9·36	7·58	6·88	209 6
206	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	210 6
207	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	211 6
208	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44 5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	212 7
209	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	213 7
210	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	214 7
211	6·67	6·12 6·40	7·34	8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	215 8
212	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	216 8
213	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35 9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	217 9
214	7·86	6·50	5·94	6·16	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	218 9
215	9·90	7·96	6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	219 9
216	12·80	10·52	8·01	5·84	4·76	4·81	5·98 7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	220 10
217	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	221 10
218	15·72	13·66	10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60 13·60	16·07	17·04	222 11
Sum	744·20	733·19	711·16	731·34	740·36	768·40	785·65	776·33	768·16	753·67	754·56	763·77	754·36	749·89	752·91	773·56	778·27	798·17	796·67	805·67	792·94	781·54	764·43	740·97	No. of Days. 73ᵈ 4ʰ.
No.	74	74	72	73	73	73	74	73	73	73	74	73	73	73	73	74	73	73	73	73	73	74	73	72	18,320·17

FORMS FOR SHORT-PERIOD TIDES.

SERIES L.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
219	16·38	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	223 11
220	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	224 11
221	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	4·58	7·04	10·14	13·35 16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	225 12
222	16·18	16·06	14·38	11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	226 12
223	14·70	15·80	15·18	13·36	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	227 12
224	11·87	13·60	14·46 13·96	13·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	228 13
225	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	229 13
226	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12 11·23	9·96	8·64	7·77	7·46	7·69	8·30	9·04	230 14
227	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	231 14
228	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	232 14
229	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26 12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	233 15
230	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	234 15
231	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27 5·96	5·56	235 16
232	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	5·17	236 16
233	5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	237 16
234	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36 6·10	6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	238 17
235	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	239 17
236	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	240 17
237	5·74	5·64	6·67	8·36 10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	241 18
238	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	242 18
239	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96 13·64	14·58	14·07	12·68	10·68	8·97	243 19
240	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	244 19
241	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	245 19
242	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46 12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	246 20
243	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96	247 20
244	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04 15·98	248 21
245	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	249 21
246	17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	250 21
247	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	15·76	16·64 15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	251 22
248	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	252 22
249	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06	253 22
250	14·30	16·51	17·04	15·88	12·99 9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	254 23
251	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	255 23
252	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	11·46	9·44	8·00 7·36	7·56	8·36	9·51	11·10	257 0
253	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	258 0

254	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	259	0
255	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14 7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	260	1
256	9·86	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	261	1
257	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	262	1
258	8·54 8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	263	2
259	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	264	2
260	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04 10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	265	3
261	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	266	3
262	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	267	3
263	5·74	4·48	4·66	6·00	8·44	11·24 13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	268	4
264	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	269	4
265	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98 14·86	12·14	8·87	6·16	270	5
266	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	271	5
267	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	272	5
268	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13 12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	273	6
269	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	274	6
270	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	275	6
271	11·16	9·92 8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	276	7
272	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	277	7
273	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26 8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	278	8
274	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	279	8
275	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	280	8
276	14·38	16·70	17·32	16·33	13·48	9·84	7·20 5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	281	9
277	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	282	9
278	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62 5·50	8·04	11·13	283	10
279	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	284	10
280	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	285	10
281	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04 11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	286	11
282	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34	287	11
283	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	7·66	7·41	7·56	8·04	288	11
284	8·76	9·91	11·17 12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02	289	12
285	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	290	12
286	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90 11·50	11·78	11·53	10·67	9·30	8·14	7·56	291	13
287	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	292	13
288	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	293	13
289	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56 14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	7·92	294	14
290	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	295	14
291	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16 11·00	8·32	296	15
Sum	757·40	783·38	817·68	801·03	787·31	777·56	766·91	785·93	767·18	752·00	747·92	752·45	770·82	788·49	779·87	783·29	777·60	751·13	745·10	732·96	732·43	713·15	722·45	728·20	No. of Days. 74d 4h.	
No.	74	74	75	74	74	74	74	75	74	74	74	74	75	74	73	74	75	74	74	74	74	74	75	74	18322·24	

FORMS FOR SHORT-PERIOD TIDES.

Series L.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
292	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	297 15
293	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	298 15
294	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66 2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	299 16
295	8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96	16·12	14·06	300 16
296	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	301 16
297	13·26	10·86	8·80	7·58 7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	302 17
298	12·88	11·01	9·42	8·12	7·64	7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	303 17
299	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06 7·90	9·22	10·97	12·56	13·72	14·38	304 18
300	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	305 18
301	14·54	14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36	12·50	306 18
302	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	5·86 7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	307 19
303	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	308 19
304	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67 11·25	309 20
305	13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	9·60	310 20
306	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	311 20
307	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92 16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	312 21
308	11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	313 21
309	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56	7·92	314 21
310	9·16	10·68	12·24	13·26	13·26 12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	315 22
311	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	316 22
312	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72 10·53	9·66	9·14	8·92	8·96	317 23
313	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	318 23
314	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88	319 23
315	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98 9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	8·13	321 0
316	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	13·00	11·72	10·14	8·38	322 0
317	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	13·94	13·04	11·34	9·30	323 0
318	7·45 5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87	10·56	7·98	324 1
319	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	14·20	12·26	9·36	325 1
320	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84 6·36	8·12	10·44	12·84	14·46	15·08	13·97	11·41	8·07	326 2
321	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	15·17	13·27	9·96	327 2
322	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	14·80	12·31	328 2
323	8·84	5·46	3·00	1·66	2·20	4·15	6·95 10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	14·67	15·26	14·06	11·32	329 3
324	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	14·72	13·35	330 3
325	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30 12·38	13·76	13·96	12·68	331 4
326	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	332 4
327	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	333 4

328	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34 14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	334 5
329	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	335 5
330	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	336 5
331	10·56	12·60 14·12	14·40	13·86	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	337 6
332	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	338 6
333	9·54	12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56 12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	339 7
334	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	340 7
335	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	341 7
336	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72 10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	342 8
337	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	343 8
338	8·20	10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64 5·07	5·86	7·43	344 9
339	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	345 9
340	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	346 9
341	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73 8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	347 10
342	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	348 10
343	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	349 10
344	9·04	9·10	9·74	10·90 12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	350 11
345	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	351 11
346	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75	4·90	4·92	6·07	7·94 10·07	12·03	13·66	14·48	14·16	12·76	10·77	352 12
347	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	353 12
348	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	354 12
349	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04 15·14	15·03	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	355 13
350	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	356 13
351	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66 18·34	17·37	357 14
352	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	17·88	358 14
353	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	·	·	·	·	·	·	·	·	·	359 14
354	·	·	·	·	·	·	·	·	·	·	·	·	·	:	·	·	·	·	·	·	·	·	·	·	360 15
355	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	361 15
356	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	362 15
357	·	·	·	·	:	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	363 16
358	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	364 16
359	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	:	·	·	·	·	·	365 17
360	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	366 17
361	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	367 17
362	·	·	·	·	·	·	·	·	·	:	·	·	·	·	·	·	·	·	·	·	·	·	·	·	368 18
363	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	369 18
364	·	·	·	·	·	·	·	·	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	645·19	639·71	621·95	643·14	641·99	632·37	648·86	660·85	672·34	672·17	669·20	657·44	632·31	613·85	619·54	606·11	617·49	615·29	619·11	634·50	650·24	654·79	670·21	654·81	No. of Days.
No.	63 / 74	63 / 74	62 / 73	64 / 75	63 / 75	62 / 73	63 / 74	63 / 74	63 / 73	63 / 74	63 / 73	63 / 73	63 / 73	63 / 74	63 / 73	62 / 73	62 / 73	62 / 73	62 / 74	62 / 73	62 / 73	62 / 73	62 / 73	62 / 73	62ᵈ 14ʰ / 73ᵈ 11ʰ / 15,303·46

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - \frac{3}{2}\sigma + \frac{1}{2}\varpi)$. SERIES N. Motion per mean Solar hour = 14°·2198648.

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70 15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	16·66	2 0
2	15·40	12·16	8·40	4·86 2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68 16·63	16·96	15·24	3 2
3	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90 5·23	4·96	6·16	8·86	12·14	14·87	16·40	16·40	14·28	4 3
4	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38 17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	12·28	14·51	15·96	15·58	13·48	5 4
5	10·47	7·54	5·76	5·07	5·67 7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67	12·12	14·04	15·00	14·45 12·62	10·24	6 6
6	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55 7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	7 7
7	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87 11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	11·16	8 8
8	10·27	9·64	9·60	9·90	10·60	11·70 12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60 10·93	9 10
9	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	8·96 10·26	11·64	12·67	13·14	12·97	12·20	11·24	10 11
10	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97 7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	11 12
11	10·27	9·77	9·62	9·89	10·44	11·24	11·97 12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	12 13
12	10·02 9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10 15·20	15·17	13·97	12·27	10·58	9·35	13 15
13	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66	7·32	5·82	5·14 5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	14 16
14	8·16	8·36	9·30	10·74	12·46	13·64	13·98 13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	15 17
15	7·74	8·41 9·71	11·76	13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82 11·22	8·94	7·54	6·94	7·15	16 19
16	8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66 12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	17 20
17	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48 5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	18 21
18	9·84	12·14	14·06 14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80 5·43	6·26	8·16	10·65	19 23
19	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36 15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	11·40	21 0
20	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30 7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	11·76	22 1
21	13·36	14·14	13·72	12·06 9·94	8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02 9·76	11·65	13·04	23 3
22	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76 8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	24 4
23	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70 13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	6·56	7·64	9·14	10·84	12·34	25 5
24	13·44	13·81	13·33	12·18 10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78	8·55	10·33 12·22	13·56	26 7
25	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	6·83 5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	27 8
26	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70 13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	28 9
27	16·74	16·12	14·36	11·40	8·83 7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04 17·86	29 11
28	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16 3·07	5·52	8·75	12·46	16·01	18·10	18·47	30 12
29	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	16·84 15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	31 13
30	16·30	12·42	8·97	6·01	4·46	4·57 6·12	9·14	12·56	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66 14·67	32 15
31	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36 12·84	15·86	17·74	17·94	16·48	13·27	33 16
32	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66 6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	34 17
33	8·76	6·34	4·92	4·74	5·86	8·26	11·07 13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	10·16	35 18
34	7·86 6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66 14·44	13·11	11·12	9·30	7·54	36 20
35	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06 9·26	9·66	10·60	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	37 21

36	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97 11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	38 22
37	7·24	6·94 7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76 9·97	9·00	8·00	7·11	40 0
38	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17 9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	6·85	41 1
39	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32 12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	42 2
40	5·54	5·82	6·94 8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47 8·56	6·64	5·46	5·20	43 4
41	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03 12·66	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	44 5
42	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02 7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	45 6
43	6·86	9·20	11·97	14·34 15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	14·56	14·85	13·63	10·90	7·86	5·57	4·07 4·04	5·46	7·84	46 8
44	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50	15·15 13·08	9·90	6·94	4·75	3·92	4·66	6·62	9·46	47 9
45	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54 7·84	10·54	13·30	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	48 10
46	13·68	15·84	16·68	15·86	13·15 10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14 12·18	14·74	49 12
47	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68 7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	50 13
48	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	10·40	12·80 14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	51 14
49	15·32	14·12	11·86	9·24	6·90	5·18 4·58	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16 14·12	52 16
50	12·82	10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45 8·28	8·67	9·76	11·20	12·50	13·18	13·06	53 17
51	11·88	10·25	8·57	6·98	5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02 12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	54 18
52	11·70	10·50	8·90	7·32	5·96	5·24	5·12 5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	55 19
53	12·26 11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21 7·64	9·18	11·00	12·40	13·36	13·52	56 21
54	12·60	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33 12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	57 22
55	13·76	11·70	8·84	6·08	4·05	3·42	4·14	6·18 8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	58 23
56	14·57	11·93 8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66 11·92	14·74	16·46	16·54	14·66	60 1
57	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20 6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	13·86	61 2
58	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44 17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76	15·76	12·96	62 3
59	9·44	6·74	4·67 4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02 16·28	14·66	11·66	8·60	63 5
60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06 4·86	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	64 6
61	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72 10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	65 7
62	7·56	7·56	8·42	9·82 11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40 10·07	9·16	8·96	66 9
63	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66 10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	67 10
64	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87 7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	68 11
65	10·36	10·22	10·36	10·76	11·26 11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78 10·20	9·73	69 13
66	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56 12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	70 14
67	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56 6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	71 15
68	8·03	8·46	9·64	10·86	12·06	12·78 12·56	11·57	9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88 7·05	72 17
69	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16 13·87	11·66	9·44	7·56	6·34	6·07	6·86	73 18
70	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	6·24 8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	74 19
Sum	783·91	741·93	710·19	709·60	684·10	693·37	732·72	748·53	791·19	830·15	840·57	818·68	775·35	756·44	712·26	701·39	704·93	703·75	731·39	771·67	803·35	819·91	834·91	843·62	No. of Days. $73^d\ 20^h$.
No.	73	73	73	75	74	74	74	73	73	75	75	74	73	74	73	74	75	74	73	73	74	74	74	75	18243·91

SERIES N.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
71	9·24	11·72	13·95	15·20	15·12	13·39	10·64 7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	75 20
72	10·10 13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22 4·92	3·64	4·00	5·66	8·33	11·52	76 22
73	14·30	16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86	14·66 16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	77 23
74	15·23	16·56	16·25	14·26	10·83	8·00	5·75 5·11	5·88	7·84	19·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	79 0
75	15·92	16·74 15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36 6·06	8·47	11·31	13·87	15·62	80 2
76	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57 11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	15·36	81 3
77	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06 10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	82 4
78	14·90	14·06	12·63 11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46 11·24	13·02	14·08	14·52	83 6
79	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67 8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	84 7
80	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76 11·26	12·36	12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	85 8
81	15·14	14·16	12·20 9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50 14·54	15·84	15·94	86 10
82	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	6·93 5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	87 11
83	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62 16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	88 12
84	13·58	10·14	7·06	4·83 3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08 15·36	11·92	89 14
85	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12 7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	90 15
86	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64 12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	91 16
87	5·84	4·04	3·84	4·93	7·24 10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14 5·16	92 18
88	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48 14·74	14·92	13·67	11·34	8·76	6·67	5·40	93 19
89	5·22	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78 8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	94 20
90	6·22	7·44	9·20	10·85	12·64	14·05 14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70 7·30	95 22
91	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54 10·36	9·16	8·12	7·47	7·44	7·87	96 23
92	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87 10·02	10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	98 0
93	8·76	9·87	11·04	11·96	12·50	12·66	12·42 11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	99 1
94	8·63 9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50 9·40	8·46	7·84	7·76	8·43	100 3
95	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47 10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	101 4
96	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96 8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	102 5
97	9·72	11·72 13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28 6·66	6·02	6·46	7·88	10·06	103 7
98	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36 16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	104 8
99	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42 3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	105 9
100	14·40	15·97	16·08 14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57 7·24	10·07	13·10	15·40	106 11
101	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37 10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97	107 12
102	16·50	15·10	12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64 12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	108 13
103	15·54	13·66	10·74	7·44 4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14 14·15	15·02	14·50	109 15
104	12·53	9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07 7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	110 16
105	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87 14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	111 17

106	11·58	10·14	8·48	6·94	6·06 5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43 12·66	12·10	112 19
107	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74 6·96	6·96	7·85	9·40	10·96	12·36	13·06	13·12	113 20
108	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66 14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	13·72	13·87	114 21
109	12·97	11·36	9·32	7·66	6·62	6·47 7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94 13·86	115 23
110	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74 6·70	9·17	11·77	14·02	15·57	15·54	14·03	117 0
111	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92 7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14	16·26	15·76	13·86	118 1
112	11·00	8·24	6·47	5·97	6·54	7·98	10·16 12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	16·57	15·46	12·94	119 2
113	10·06 7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56 14·92	16·36	16·28	14·70	11·93	9·06	120 4
114	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42 4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22	121 5
115	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45 13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	9·46	7·76	122 6
116	6·94	7·06 7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76 13·04	10·84	8·96	7·76	7·44	123 8
117	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54 9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14	8·84	8·15	8·06	124 9
118	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94 6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	8·56	125 10
119	9·00	9·74	10·55 11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94 9·24	8·96	8·94	9·17	126 12
120	9·58	10·	10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22 13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	127 13
121	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06 8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	128 14
122	8·62	9·56	10·46	11·34 11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26 6·90	7·45	8·52	129 16
123	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02 13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	130 17
124	10·20	12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27 7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	131 18
125	10·95	13·28	14·84	15·34	14·46 12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46 9·08	11·92	132 20
126	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66 7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	133 21
127	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30 12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	134 22
128	16·50	17·69	17·06	14·58	10·90	8·02 5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68 16·97	136 0
129	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24 1·86	3·24	5·60	8·58	12·24	15·14	17·16	137 1
130	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34	15·47 15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	13·92	15·50	17·10	138 2
131	17·16	15·40	12·67	9·57	7·36	6·16	6·11 7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	139 3
132	16·23 14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33 8·08	10·42	12·87	14·66	15·72	15·46	140 5
133	14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76 10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	141 6
134	13·52	11·62	9·46	7·84	6·86	6·52	6·83 8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	142 7
135	12·92	11·14 9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00 11·62	13·06	13·93	13·82	12·68	143 9
136	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72 9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96	12·62	144 10
137	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67 11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	145 11
138	10·50	7·84	5·72 4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66 14·36	13·76	11·92	9·27	146 13
139	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60 7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	147 14
140	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74 15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	148 15
Sum	853·32	826·32	788·18	704·52	672·72	654·78	687·53	715·07	755·90	811·69	848·81	860·01	850·38	810·82	764·66	701·03	659·25	636·86	667·19	709·45	750·90	796·40	836·62	857·46	No. of Days. 73d 20h.
No.	74	74	75	73	73	73	76	74	74	74	73	73	74	75	74	73	74	73	74	75	74	73	73	74	18219·87

FORMS FOR SHORT-PERIOD TIDES.

SERIES N.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
141	4·84	3·94	4·50 / 6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22	10·78 / 8·10	5·76	4·27	149 17
142	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52 / 11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32	150 18
143	4·97	6·54	8·70	11·00	13·46	15·32	16·07	15·67	14·17	11·77 / 9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	151 19
144	5·84	7·60	9·46	11·87 / 14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96	9·94	7·67	6·16	5·18 / 5·56	6·86	152 21
145	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	12·84 / 12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	153 22
146	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08 / 8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	154 23
147	10·30	11·90	13·54	14·68	14·80 / 13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82 / 11·10	156 1
148	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06 / 9·98	8·86	8·32	8·36	9·00	10·04	11·54	157 2
149	13·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12 / 10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	158 3
150	13·44	14·22	14·34	13·94	12·86	11·59 / 10·03	8·74	7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77 / 13·98	159 5
151	14·67	15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28	13·22	14·76	15·82	15·76	14·97	13·34	11·70 / 10·67	10·27	10·56	11·52	12·90	14·12	160 6
152	15·30	15·65	15·48	14·17	12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77 / 15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	161 7
153	15·47	16·06	15·22	13·50	10·84	8·22	6·16 / 4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	162 8
154	15·74 / 16·29	15·33	12·77	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22 / 7·81	9·55	12·08	14·54	16·07	163 10
155	16·21	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53 / 17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	164 11
156	16·14	14·28	10·90	7·10	4·31	2·62	2·37	3·68 / 6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	165 12
157	15·96	13·80 / 10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00 / 9·56	12·80	15·12	16·05	15·26	166 14
158	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07 / 9·02	6·70	5·67	5·93	7·41	10·07	13·02	14·92	15·57	14·68	167 15
159	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67 / 14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85	14·05	168 16
160	11·96	9·47	7·26 / 6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86	6·32	6·58	7·80	9·82	12·04 / 13·55	14·17	13·54	12·03	169 18
161	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04 / 6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	170 19
162	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74 / 14·75	13·73	12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	171 20
163	11·94	10·67	9·60	8·94 / 8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66 / 14·10	13·63	12·46	172 22
164	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	6·70	6·08	6·22 / 7·28	9·00	10·94	12·77	14·05	14·63	14·17	12·86	173 23
165	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80 / 11·00	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	175 0
166	10·90	9·46	8·62	8·24	8·56 / 9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77 / 12·06	10·27	176 2
167	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00 / 10·50	12·90	14·56	15·33	14·70	13·32	11·14	9·44	177 3
168	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83 / 4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	15·44	14·56	12·56	10·36	8·63	178 4
169	7·62	7·30	7·74	8·86	10·67	12·47 / 13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	7·84	10·40	12·82	14·74	15·56	15·33	13·80	11·44	9·35	7·79 / 7·04	179 6
170	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12 / 15·46	14·48	12·44	9·96	8·16	6·86	6·42	180 7
171	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65 / 7·72	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	181 8
172	7·46	9·06	11·01	12·70	13·51	13·01	11·07 / 8·44	6·12	4·72	4·42	5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	182 9
173	8·16 / 9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17 / 9·22	7·55	6·51	6·57	7·34	8·72	183 11
174	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	9·24	10·97 / 12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	184 12
175	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96 / 6·92	7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	185 13

176	10·80	11·92 12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70 6·48	6·84	7·86	9·16	10·52	186 15
177	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66 13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	187 16
178	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34 9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	188 17
179	12·30	13·47	13·96 13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90 6·40	8·62	10·94	13·04	189 19
180	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32 10·27	7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	190 20
181	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54 11·60	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	191 21
182	16·76	17·06	15·90	13·27 10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	15·05	14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54 13·00	15·92	17·60	192 23
183	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65 2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	194 0
184	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12 15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	195 1
185	17·46	14·77	11·14	7·30	5·12 4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38 17·97	16·76	196 3
186	13·80	10·58	7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82 5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	197 4
187	12·60	9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40 13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	198 5
188	11·28	8·50	6·30	5·34	5·40	6·24 8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96 10·60	199 7
189	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62 10·96	12·55	13·78	14·07	13·40	11·92	10·10	200 8
190	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87 10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77	201 9
191	8·47	7·34	6·76	6·86	7·36	8·56 10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50	11·42	10·20	202 10
192	8·76 7·52	6·90	6·76	7·25	8·50	10·29	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70 12·60	12·94	12·66	11·70	10·10	8·56	203 12
193	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74 9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36	7·66	204 13
194	6·38	5·86	6·06	7·07	8·94	10·96	13·07 14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31	205 14
195	5·74	5·33 6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	13·92 12·56	10·36	8·02	6·14	5·26	206 16
196	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20 8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	207 17
197	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15 13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	208 18
198	6·26	8·20	10·44 13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78 5·10	4·56	5·42	7·13	209 20
199	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46 14·24	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	210 21
200	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02 6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	211 22
201	11·76	13·95	15·50 15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12 8·61	10·53	12·64	213 0
202	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84 10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	214 1
203	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34 8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	215 2
204	14·29	14·38	13·46	11·64 9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02 13·24	14·10	216 4
205	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34 10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62	217 5
206	13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	10·20 11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	218 6
207	13·55	12·96	11·68	9·90	7·96 6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57 13·70	14·26	219 8
208	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38 7·60	7·78	8·76	10·54	12·56	14·24	15·18	220 9
209	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14 17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	221 10
210	15·72	13·66	10·33	6·96	4·40	3·04 3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04 16·38	222 12
Sum	824·98	806·89	800·14	756·21	712·03	703·03	690·51	703·39	737·45	805·95	824·51	839·99	848·43	833·50	795·99	753·48	729·70	709·59	693·46	709·14	727·67	786·15	841·37	859·94	No. of Days. 73d 21h.
No.	73	73	75	74	74	75	73	73	73	75	74	74	74	73	73	74	75	74	73	74	73	74	75	75	18493·50

Series N.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	d h
211	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07 7·18	10·36	13·94	16·34	17·16	16·04	223 13
212	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74 13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	224 14
213	12·15	8·23	5·44	3·52	3·32	4·58	7·04 10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	225 15
214	11·26 7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05 14·70	15·80	15·18	13·36	10·62	226 17
215	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96 5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48	10·40	227 18
216	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74 14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	228 19
217	9·74	9·12 8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33 12·66	12·46	12·00	11·36	10·62	229 21
218	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69 8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	230 22
219	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97 11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	231 23
220	10·72	10·26	9·92 9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66 13·26	12·36	11·22	10·18	233 1
221	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37 10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	234 2
222	8·82	8·84	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16 8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	235 3
223	8·36	8·48	8·96	10·06 11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	10·57 8·64	7·46	7·31	236 5
224	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00 15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	237 6
225	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97 5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	238 7
226	8·63	10·83	13·20	15·21	15·71 14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74 7·13	9·22	239 9
227	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34 12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28	240 10
228	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62 13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	241 11
229	13·77	15·36	15·38	14·00	11·50	8·72 6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64 13·96	242 13
230	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·5c 5·32	5·38	6·34	7·85	9·86	11·96	13·64	243 14
231	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44 13·86	12·25	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	244 15
232	13·74	13·44	12·44	11·04	9·83	8·84	8·57 8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	245 16
233	13·37 13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21 6·66	7·76	9·20	10·76	12·36	13·54	246 18
234	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98 12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	247 19
235	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14 9·04	10·38	12·00	13·14	13·74	13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	248 20
236	15·98	15·74 14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50 7·96	10·88	13·80	16·04	17·04	249 22
237	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29 9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	250 23
238	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06 13·28	15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	252 0
239	15·87	12·42	8·56 5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47 16·22	17·47	17·02	14·77	253 2
240	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	5·38 3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	254 3
241	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42 16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	255 4
242	7·87	5·34	3·84	3·92 5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73 12·52	9·86	7·17	256 6
243	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	11·46	9·44	8·00	7·36	7·56	8·36 9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	257 7
244	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43 10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	258 8
245	6·44	6·67	7·34	8·36	9·74 11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44 7·52	7·14	259 10

246	7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24 10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	260 11
247	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97 10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	261 12
248	7·42	7·64	8·34	9·42	10·67	11·65 12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26 6·68	262 14
249	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38 12·82	12·42	11·17	9·62	7·86	6·55	6·10	263 15
250	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97 6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	264 16
251	6·36	8·04	10·20	12·32	13·87	14·64 14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	265 17
252	6·87 9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23 9·34	6·94	5·36	4·94	5·94	8·06	266 19
253	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44 11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	267 20
254	11·54	14·06	15·76	16·07	14·86	12·14	9·06 6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	268 21
255	12·74	14·90 15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54 5·42	6·51	8·50	11·14	13·77	269 23
256	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21 15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	271 0
257	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06 5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	272 1
258	14·83	14·05 12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87	7·56	7·92	8·94 10·67	12·44	13·74	13·97	273 3
259	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40 10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	274 4
260	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81 10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	275 5
261	12·14	11·16	9·92 8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84 12·04	12·52	12·48	276 7
262	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34 9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	277 8
263	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97 13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	278 9
264	15·04	13·48	11·07	8·36 6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71 16·85	16·30	279 11
265	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14 3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	280 12
266	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40 16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	281 13
267	12·76	9·26	6·56	5·24	5·38 6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22 15·06	11·70	282 15
268	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04 11·13	14·40	16·50	17·22	16·16	13·58	10·36	283 16
269	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64 6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13	9·47	284 17
270	7·47	6·58	6·90	7·84	9·30	11·26 13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11 7·80	285 19
271	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36 14·36	13·40	11·82	10·44	9·16	8·44	286 20
272	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44 7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	287 21
273	8·94	9·08	9·61	10·14	11·01	11·52	11·46 10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	288 22
274	9·12 9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34 12·06	11·48	10·82	9·97	9·24	8·77	290 0
275	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80 9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	291 1
276	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53 10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	292 2
277	7·36	8·12 9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16 10·00	8·34	6·96	6·50	6·88	293 4
278	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17 13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	294 5
279	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	7·92 6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	295 6
280	9·03	11·80	14·15 15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24 3·86	5·14	7·32	10·15	296 8
Sum	786·84	778·90	729·00	690·22	695·83	719·77	727·18	755·69	801·68	796·19	800·35	786·08	802·02	759·83	726·80	716·36	697·70	704·38	747·63	774·14	795·36	805·31	820·31	793·00	No. of Days.
																									73^d 20^h.
No.	74	75	74	73	73	74	74	74	75	73	73	73	75	74	74	74	73	73	75	75	74	73	74	73	18210·57

FORMS FOR SHORT-PERIOD TIDES.

Series N.—(*Continued*).

Day	0^{h}	1^{h}	2^{h}	3^{h}	4^{h}	5^{h}	6^{h}	7^{h}	8^{h}	9^{h}	10^{h}	11^{h}	12^{h}	13^{h}	14^{h}	15^{h}	16^{h}	17^{h}	18^{h}	19^{h}	20^{h}	21^{h}	22^{h}	23^{h}	Solar Hour	
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d*	*h*
281	13·10	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46 13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	297	9
282	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	6·88 8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00	298	10
283	15·95	17·47	17·44	15·72 12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47 10·55	13·92	16·35	299	12
284	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26 6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	300	13
285	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14 14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	301	14
286	16·22	15·16	13·26	10·86	8·86 7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00 15·22	15·38	302	16
287	14·58	12·88	11·01	9·42	8·12	7·64	7·93	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68 6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	303	17
288	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	12·06	12·64 12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38	304	18
289	14·04	13·04	11·45	9·76	8·15	7·22 7·02	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54 14·38	305	20
290	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86 7·24	8·35	10·36	12·50	14·13	15·08	14·96	306	21
291	13·80	11·64	9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37 14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	307	22
292	13·56	10·92	8·12	5·82	4·22	4·10	5·32 7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	308	23
293	12·98 9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67 11·25	13·84	15·52	15·84	14·55	11·68	310	1
294	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03 9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	311	2
295	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05 16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	312	3
296	5·66	3·69 2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	14·50 14·36	12·66	9·94	7·20	4·97	313	5
297	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86 6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	314	6
298	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66 12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	315	7
299	5·50	6·66	8·34 10·52	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16 7·62	6·54	6·20	6·84	316	9
300	7·96	9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00 10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	317	10
301	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72	10·53 9·66	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	318	11
302	9·44	10·56	11·74	12·76 13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94 8·71	8·90	9·50	319	13
303	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86 11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	320	14
304	10·38	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	8·13 7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	321	15
305	10·02	11·20	12·46	13·23	13·47 13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96 8·75	10·13	322	17
306	11·64	13·14	13·94	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98 13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	323	18
307	11·76	13·33	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67 6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	324	19
308	12·25	13·88	14·74	14·20	12·26 9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44 12·84	325	21
309	14·46	15·08	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86 7·26	5·65	5·46	6·44	8·40	11·20	13·57	326	22
310	15·11	15·17	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97 15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	327	23
311	15·50	14·80	12·31	8·84	5·46	3·00 1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	14·67	329	0
312	15·26 14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50 5·88	7·64	10·25	12·77	14·29	14·72	330	2
313	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57 15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	331	3
314	12·68	10·56	8·18	6·28	4·97	4·83	5·73 7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	332	4
315	12·24	10·73 8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70 9·30	10·84	12·16	12·76	12·53	333	6

316	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30 10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	334 7
317	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02 11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88	335 8
318	13·62	12·36 10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56 12·60	14·12	14·40	13·86	336 10
319	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84 5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	337 11
320	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94 14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	338 12
321	12·88	10·26	8·38 7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54 16·21	14·70	12·20	339 14
322	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64 6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	340 15
323	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44 10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	341 16
324	8·26	7·37	7·26	8·12 9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44 9·32	7·80	342 18
325	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88 15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	343 19
326	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64 5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	344 20
327	7·62	8·50	10·02	11·60	12·67 13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73 7·38	7·80	345 22
328	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06 12·87	11·31	9·72	8·40	7·76	7·73	8·27	346 23
329	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95 10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	348 0
330	9·62	10·53	11·27	11·70	11·62	11·14 10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58 9·36	349 2
331	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26 8·86	7·83	7·22	7·36	7·86	8·85	350 3
332	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97 12·94	13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	6·15	6·82	8·20	351 4
333	9·97	11·56	12·90	13·50	13·36	12·36	10·92 9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75	4·90	4·92	6·07	7·94	352 5
334	10·07 12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	8·50	6·30 4·47	3·64	4·12	5·82	8·20	10·84	353 7
335	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33 14·26	13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	354 8
336	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98 7·04	8·06	10·00	12·15	14·04	15·14	15·03	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	355 9
337	16·13	17·72 17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	15·20	12·64	9·26	5·91	3·10	1·55	1·93 4·00	7·06	10·68	14·30	17·04	356 11
338	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	14·94	12·16 8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	357 12
339	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65 10·63	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	358 13
340	17·88	16·62	13·58 9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	.	.	.	.	.	:	.	.	.	359 15
341	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	:	.	.	.	.	.	.	.	.	360 16
342	.	.	.	.	.	.	.	.	.	:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	361 17
343	.	.	.	:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	:	.	.	362 19
344	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	:	.	.	.	.	.	.	.	.	363 20
345	.	.	.	.	.	.	.	.	.	.	:	.	.	.	.	.	.	.	.	.	.	.	.	.	364 21
346	.	.	.	.	:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	:	.	365 23
347	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	:	.	.	.	.	.	.	.	367 0
348	.	.	.	.	.	.	.	.	.	.	.	:	.	.	.	.	.	.	.	.	.	.	.	.	368 1
349	.	.	.	.	.	:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	:	369 3
350	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	:	.	.	.	.	...	...	370 2
Sum	744·70	732·90	684·61	651·26	620·19	564·80	561·73	592·35	640·28	659·68	694·11	747·68	733·94	700·42	653·34	615·20	575·45	545·14	543·44	561·20	593·16	651·90	698·64	722·63	No. of Days.
No.	63/73	64/74	63/73	63/74	64/75	63/74	63/73	63/73	64/74	63/74	63/74	64/75	63/73	63/73	63/73	63/76	62/74	62/74	63/74	62/73	61/73	62/74	63/74	62/73	62^d 21^h. 73^d 18^h. 15488·75

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - \frac{1}{2}\sigma + \frac{1}{2}\varpi - \eta)$. SERIES λ. Motion per mean Solar hour = $14^\circ{\cdot}7278127$.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	1 23
2	16·66	15·40	12·16	8·40 4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	16·63	3 0
3	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	14·87	4 0
4	16·40	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01 11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	12·28	14·51	5 1
5	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67	12·12	6 1
6	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24 12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76	11·80	7 2
7	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	8 2
8	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06 7·34	8·07	9·14	9 3
9	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	10 3
10	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	11 3
11	7·28	8·73	10·47	12·14 13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	12 4
12	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62	5·56	13 4
13	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58 9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66	7·32	5·82	5·14	5·44	14 5
14	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	10·84	8·24	6·20	4·76	4·46	15 5
15	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76 13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	16 6
16	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	17 6
17	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48 5·34	4·30	4·66	18 7
18	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	4·24	19 7
19	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	20 7
20	5·06	6·54	8·66	11·04 13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	21 8
21	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	22 8
22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14 7·34	6·17	6·00	6·68	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	23 9
23	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	24 0
24	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	6·56	7·64 9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	25 10
25	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	26 10
26	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56 15·33	13·76	27 11
27	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	28 11
28	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	29 11
29	17·00	14·36	10·96	8·07	6·27 5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	30 12
30	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	31 12
31	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46 17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	32 13
32	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	33 13
33	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66	6·90 5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	34 14
34	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	35 14
35	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08 13·76	14·66	36 15

36	14·44	13·11	11·12	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	37 15
37	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	11·32	38 15
38	12·06	12·26	11·78	10·88	9·87 8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	39 16
39	11·27	11·45	11·25	10·76	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	40 16
40	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	6·85	6·30	6·50 7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	41 17
41	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	42 17
42	8·96	10·24	11·52	12·40	12·66	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84 13·98	12·14	10·00	8·54	7·66	7·53	8·16	43 18
43	9·56	11·03	12·66	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	44 18
44	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96 6·74	45 19
45	8·48	10·85	13·07	14·56	14·85	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	46 19
46	7·26	9·70	12·25	14·42	15·50	15·15	13·08	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	47 19
47	5·54	7·84	10·54	13·30	15·12	15·66 14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	48 20
48	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	49 20
49	5·07	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60 6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	50 21
50	5·80	7·87	10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	51 21
51	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16 14·12	12·82	10·83	8·73	6·87	5·45	4·92	52 22
52	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98	5·77	53 22
53	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	7·32 5·96	54 23
54	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	12·26	11·27	9·76	7·96	55 23
55	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	12·60	10·86	56 23
56	8·63	6·40	4·63	4·06	4·70	6·46 8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	13·76	11·70	58 0
57	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	14·57	59 0
58	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34 15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66	60 1
59	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	61 1
60	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27 4·33	7·10	10·34	13·76	15·97	16·76	15·76	62 2
61	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02	16·28	63 2
62	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	15·64	64 2
63	15·33 13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	65 3
64	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	66 3
65	13·74	12·74	11·40	10·07	9·16	8·96	9·27 9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	12·88	67 4
66	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	68 4
67	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56 11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	69 5
68	12·08	12·36	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	70 5
69	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84 7·56	6·74	6·70	7·63	8·94	10·62	71 6
70	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	9·92	8·17	6·67	5·98	6·16	7·20	8·87	72 6
71	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	7·27	5·74	5·30	5·90	7·44	73 6
72	9·66 11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	6·24	8·10	74 7
73	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	75 7
Sum	805·33	779·93	769·55	794·05	770·85	773·79	754·69	739·87	740·77	772·47	804·96	812·35	805·13	785·61	772·60	783·82	756·64	762·68	725·23	700·59	697·14	723·64	761·76	768·59	No. of Days. 74d 8h.
No.	75	73	73	76	75	75	74	73	73	75	76	75	74	73	73	75	75	76	74	73	73	75	75	75	18362·04

FORMS FOR SHORT-PERIOD TIDES.

Series λ.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
74	8·94	11·85	14·34	16·00	16·06	14·53	11·64 8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	76 8
75	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	77 8
76	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60 9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	78 9
77	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12	6·08	7·14	79 9
78	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97 12·74	10·02	8·05	6·96	7·06	7·93	80 10
79	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	81 10
80	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	82 10
81	8·72 9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	83 11
82	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	84 11
83	8·96	8·11	7·96	8·44	9·76	11·26	12·36 12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	85 12
84	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	86 12
85	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	6·93 5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	87 13
86	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	88 13
87	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61 15·44	17·03	17·08	15·36	11·92	89 14
88	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	90 14
89	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	91 14
90	12·02	8·56 5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	92 15
91	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	93 15
92	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97 12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	94 16
93	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	95 16
94	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13 10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	96 17
95	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81	11·14	11·27	97 17
96	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34 9·52	9·94	10·53	10·94	11·12	98 18
97	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	99 18
98	11·88	11·89	11·44	10·50	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	10·86	100 18
99	11·90	12·70 12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	101 19
100	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	102 19
101	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66 6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	103 20
102	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	104 20
103	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40 15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	105 21
104	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	106 21
105	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24	3·17 2·56	3·47	5·74	8·64	107 22
106	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67	108 22
107	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	7·24	5·36	4·17	4·16	5·20	109 22
108	7·26	9·89	12·40 14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60	5·96	4·93	5·02	5·86	110 23

109	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	111 23
110	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26 10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	113 0
111	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52	114 0
112	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93 7·08	9·00	11·04	12·64	13·72	13·87	12·97	11·36	9·32	7·66	115 1
113	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86	11·70	9·34	116 1
114	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57 15·54	14·03	11·54	8·80	117 2
115	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14	16·26	15·76	13·86	11·00	118 2
116	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	16·57	15·46	12·94	119 2
117	10·06	7·64	6·36 6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36	16·28	14·70	11·93	120 3
118	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	121 3
119	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08 14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	122 4
120	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76	13·04	123 4
121	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35 5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	124 5
122	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	125 5
123	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10 13·34	13·78	13·40	12·16	126 6
124	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54	13·24	127 6
125	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	128 6
126	12·94	12·14	11·17	9·96 8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	129 7
127	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	130 7
128	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26 10·20	12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	131 8
129	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	132 8
130	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95 12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	133 9
131	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	134 9
132	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30 8·25	10·90	13·74	135 10
133	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	136 10
134	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	137 10
135	11·97	14·34	15·47	15·07 12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	6·11	7·20	9·40	138 11
136	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54	6·48	6·38	7·36	139 11
137	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98 5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44	140 12
138	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	141 12
139	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86 13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	142 13
140	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	143 13
141	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96	12·62	10·76 8·52	6·66	5·32	144 14
142	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·61	10·50	7·84	5·72	145 14
143	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	146 14
144	4·82	3·97	4·57	6·16 8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	147 15
145	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	148 15
Sum	729·58	750·10	763·88	784·78	751·80	743·68	751·85	738·00	744·66	730·62	713·40	709·54	725·28	764·05	763·26	798·01	779·57	774·97	780·37	784·90	788·60	766·78	739·39	724·67	No. of Days. 73d 8h.
No.	73	74	74	75	72	72	74	74	74	74	72	72	73	75	74	74	72	72	73	74	75	74	72	72	18101·74

FORMS FOR SHORT-PERIOD TIDES.

Series λ.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
146	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90 11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	149 16
147	4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	11·55	13·36	14·27	13·92	12·06	9·48	6·90	150 16
148	5·12	4·32	4·97	6·54	8·70	11·00	13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74 10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	151 17
149	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96	9·94	7·67	152 17
150	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98 9·18	7·32	153 18
151	6·03	5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	154 18
152	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	155 18
153	9·20	8·14	7·72	7·83	8·62 9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06	156 19
154	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	157 19
155	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34 13·94	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	13·86	158 20
156	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28	13·22	14·76	15·82	159 20
157	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	12·02	9·86	8·00 7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	160 21
158	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	161 21
159	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95 15·02	17·28	162 22
160	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	163 22
161	18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	164 22
162	16·44	18·12	18·40	17·00	13·80 10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	165 23
163	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	16·05	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	166 23
164	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41 10·07	13·02	14·92	15·57	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	168 0
165	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	169 0
166	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86	6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03 10·34	8·60	7·57	7·26	7·62	8·44	9·92	170 1
167	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	171 1
168	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	8·82 9·24	172 2
169	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	173 2
170	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	174 2
171	8·86	9·20	10·08	11·26	12·44	13·30 13·52	12·80	11·00	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	8·62	175 3
172	8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77	12·06	10·27	8·84	176 3
173	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11 4·16	4·64	6·10	8·00	10·50	12·90	14·56	15·33	14·70	13·32	11·14	9·44	8·17	177 4
174	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	15·44	14·56	12·56	10·36	8·63	178 4
175	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	7·84	10·40	12·82 14·74	15·56	15·33	13·80	11·44	9·35	7·79	179 5
176	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12	15·46	14·48	12·44	9·96	8·16	180 5
177	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01 7·37	181 6
178	6·64	6·36	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	182 6
179	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	183 6
180	7·55	6·51	6·57	7·34	8·72	10·61 12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	184 7

181	7.22	6.77	6.97	7.87	9.34	10.94	12.19	12.66	12.22	10.84	9.25	7.90	6.96	6.92	7.56	8.50	10.00	11.48	13.23	14.36	14.44	13.38	11.42	9.60	185 7
182	8.02	6.94	6.56	6.92	7.79	9.26	10.80	11.92	12.43	12.16	11.12	9.70 8.48	7.63	7.56	8.14	9.04	10.41	11.98	13.30	13.98	13.72	12.51	10.84	8.96	186 8
183	7.47	6.70	6.48	6.84	7.86	9.16	10.52	11.71	12.36	12.28	11.46	10.38	9.16	8.34	8.14	8.38	9.04	10.37	11.82	13.16	13.66	13.27	11.87	10.24	187 8
184	8.57	7.05	6.14	5.87	6.26	7.22	8.72	10.36	11.70	12.56	12.86	12.14	11.14	9.86	8.86	8.32	8.34	9.02 10.46	11.88	13.12	13.48	12.96	11.86	10.30	188 9
185	8.58	7.00	5.74	5.32	5.74	6.86	8.67	10.62	12.30	13.47	13.96	13.31	12.10	10.48	9.04	8.28	8.37	8.98	10.28	11.72	13.02	13.62	13.24	12.02	189 9
186	10.14	8.20	6.16	4.76	4.31	4.90	6.40	8.62	10.94	13.04	14.57	15.22	14.64	12.87	10.58	8.66	7.68	7.62	8.40	10.00	11.70	13.12	13.97	13.69	190 9
187	12.32 10.27	7.76	5.44	3.88	3.19	3.88	5.80	8.60	11.46	13.90	15.54	16.06	15.08	12.92	10.40	8.23	7.07	6.90	7.82	9.54	11.60	13.35	14.38	14.34	191 10
188	12.76	10.16	7.15	4.46	2.56	2.27	3.49	5.92	8.80	12.36	15.04	16.76	17.06	15.90	13.27	10.08	7.42	6.03	6.04	7.17	9.30	11.84	13.92	15.05	192 10
189	14.90	13.08	9.91	6.43	3.53	1.84	1.84 3.58	6.20	9.54	13.00	15.92	17.60	17.55	15.88	12.54	9.04	6.46	5.24	5.54	6.76	9.24	12.48	14.76	16.12	193 11
190	15.46	13.17	9.32	5.65	2.96	1.56	1.90	3.97	6.70	10.13	13.94	16.80	18.22	17.87	15.72	12.00	8.47	5.86	4.66	4.98	6.66	9.72	13.12	15.46	194 11
191	16.44	15.54	12.76	8.60	5.17	2.76	1.62	2.37	4.50	7.60	11.14	14.80	17.30 18.38	17.46	14.77	11.14	7.30	5.12	4.24	4.66	6.66	9.96	13.24	15.56	195 12
192	16.37	15.10	12.10	8.47	5.36	3.22	2.47	3.46	5.71	8.66	12.13	15.36	17.38	17.97	16.76	13.80	10.58	7.04	4.79	4.26	5.04	7.14	10.42	13.85	196 12
193	15.77	16.14	14.53	11.60	8.45	5.84	4.20	3.82	5.12	6.97	9.80	13.00	15.56	17.04	17.17	15.44	12.60	9.26	6.86 5.22	4.84	5.76	8.06	10.85	13.97	197 13
194	15.36	15.40	13.86	11.04	8.20	6.43	5.40	5.54	6.64	7.95	10.24	12.80	15.30	16.34	15.86	14.11	11.28	8.50	6.30	5.34	5.40	6.24	8.00	10.50	198 13
195	12.97	14.30	14.44	12.94	10.92	9.08	7.74	7.24	7.56	8.14	9.16	11.11	13.10	14.71	15.40	14.72	12.96	10.60	8.38	6.86	5.92	6.05	6.82	8.26	199 13
196	10.28 12.30	13.38	13.40	12.62	11.34	10.16	9.24	8.58	8.59	8.86	9.62	10.96	12.55	13.78	14.07	13.40	11.92	10.10	8.37	6.87	6.38	6.51	7.24	8.41	200 14
197	9.82	11.28	12.52	12.90	12.68	11.87	10.93	10.01	9.34	9.14	9.27	9.97	10.90	12.12	13.14	13.41	12.71	11.34	9.77	8.47	7.34	6.76	6.86	7.36	201 14
198	8.56	10.06	11.46	12.50	13.02	12.96	12.57 11.86	10.96	10.04	9.53	9.52	9.76	10.73	11.74	12.78	13.04	12.50	11.42	10.20	8.76	7.52	6.90	6.76	7.25	202 15
199	8.50	10.20	11.86	13.24	13.87	13.87	13.28	12.22	11.04	10.07	9.54	9.50	9.87	10.64	11.70	12.60	12.94	12.66	11.70	10.10	8.56	7.16	6.24	6.28	203 15
200	7.14	8.62	10.44	12.07	13.40	14.20	14.14	13.28	12.08	10.74	9.52	8.94	8.94 9.48	10.50	11.72	12.63	13.06	12.60	11.28	9.36	7.66	6.38	5.86	6.06	204 16
201	7.07	8.94	10.96	13.07	14.58	15.07	14.54	13.34	11.84	10.26	9.14	8.46	8.46	9.16	10.36	11.74	13.14	13.52	12.81	11.24	9.13	7.31	5.74	5.33	205 16
202	6.10	7.65	9.76	12.02	14.00	15.20	15.33	14.58	12.97	11.01	9.35	8.37	8.18	8.73	9.62	10.95	12.64	13.76	13.92 12.56	10.36	8.02	6.14	5.26	5.24	206 17
203	6.52	8.36	10.60	12.96	14.83	16.05	15.68	14.35	12.14	9.94	8.56	8.04	8.20	8.78	9.99	11.82	13.73	14.66	14.04	11.84	8.90	6.50	5.04	4.74	207 17
204	5.78	7.22	9.33	11.77	14.22	15.86	16.07	15.15	13.18	10.77	8.67	7.57	7.18	7.78	8.96	10.77	12.83	14.27	14.50	13.28	10.70	7.76	5.53	4.56	208 17
205	4.86 6.26	8.20	10.44	13.14	15.37	16.51	16.11	14.47	11.94	9.36	7.58	6.88	7.16	8.00	9.72	11.80	13.84	14.90	14.32	12.37	9.57	6.78	5.10	4.56	209 18
206	5.42	7.13	9.26	11.96	14.36	15.96	16.14	15.17	12.96	10.25	8.01	6.67	6.34	6.89	8.16	10.14	12.46	14.24	14.84	13.50	10.90	8.02	5.86	4.76	210 18
207	5.04	6.52	8.34	10.66	13.15	15.27	16.14 15.82	14.14	11.47	8.96	7.02	6.16	6.33	7.34	9.23	11.44	13.54	14.58	14.24	12.42	9.84	7.44	5.64	5.14	211 19
208	5.97	7.54	9.60	11.76	13.95	15.50	15.83	14.93	12.72	10.10	7.72	6.16	5.77	6.54	7.96	9.86	12.04	13.74	14.37	13.56	11.51	8.97	7.02	5.96	212 19
209	5.96	7.12	8.61	10.53	12.64	14.44	15.55	15.26	13.84	11.46	8.86	6.95	5.97	6.05 7.05	8.56	10.54	12.48	13.67	13.96	12.84	10.98	9.00	7.60	6.88	213 20
210	7.24	8.26	9.66	11.37	13.15	14.57	15.10	14.32	12.72	10.34	8.27	6.67	6.12	6.40	7.34	8.74	10.52	12.26	13.26	13.32	12.36	10.84	9.38	8.24	214 20
211	7.77	8.12	8.86	10.16	11.76	13.33	14.29	14.38	13.46	11.64	9.64	7.76	6.48	6.10	6.50	7.54	9.00	10.63	12.05	12.96 13.18	12.64	11.47	10.24	9.16	215 21
212	8.76	9.04	9.66	10.72	12.02	13.24	14.10	14.04	13.02	11.29	9.63	7.96	6.84	6.50	6.73	7.66	9.04	10.52	12.10	13.14	13.55	13.28	12.50	11.34	216 21
213	10.26	9.52	9.35	9.67	10.59	11.83	12.88	13.62	13.44	12.54	11.15	9.50	7.86	6.50	5.94	6.16	7.10	8.50	10.20	11.94	13.44	14.14	14.16	13.42	217 21
214	12.16	10.76 9.56	9.05	9.15	9.96	11.33	12.62	13.38	13.55	12.96	11.68	9.90	7.96	6.26	5.30	5.46	6.46	8.25	10.24	12.44	14.18	15.26	15.50	14.64	218 22
215	12.94	10.78	9.16	8.56	8.76	9.78	11.16	12.57	13.70	14.26	14.02	12.80	10.52	8.01	5.84	4.76	4.81	5.98	7.77	10.32	13.02	15.24	16.66	16.76	219 22
216	15.58	13.24	10.54	8.38	7.60	7.78	8.76	10.54 12.56	14.24	15.18	14.86	13.21	10.40	7.41	4.97	3.62	3.84	5.16	7.44	10.44	13.54	16.14	17.54	17.44	220 23
217	15.84	12.90	9.72	7.44	6.60	6.85	8.10	10.22	12.92	15.15	16.26	15.72	13.66	10.33	6.96	4.40	3.04	3.33	5.32	7.86	11.08	14.56	17.20	18.37	221 23
218	18.04	16.16	12.38	8.82	6.46	5.54	5.95	7.72	10.60	13.60	16.07	17.04	16.38	13.96 10.25	6.47	3.74	2.56	3.20	5.12	8.18	11.74	15.30	17.66	18.50	223 0
Sum	777.01	757.60	745.75	747.40	779.76	804.32	832.18	826.31	812.11	795.82	812.94	774.66	776.02	756.57	726.13	717.66	738.72	772.17	775.09	779.31	769.78	767.43	787.13	778.31	No. of Days.
No.	76	74	73	73	75	75	76	74	73	73	76	75	75	75	73	73	75	76	75	74	73	73	75	75	$74^d\ 9^h$. 18610.18

FORMS FOR SHORT-PERIOD TIDES.

Series λ.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour	
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d*	*h*
219	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	224	0
220	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	4·58 7·04	10·14	13·35	16·16	17·52	225	1
221	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	226	1
222	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	227	1
223	15·66	15·72 14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	228	2
224	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	229	2
225	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68 7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	230	3
226	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69	8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	231	3
227	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57 12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	232	4
228	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22	10·18	9·34	8·97	9·08	233	4
229	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70 9·34	8·82	8·84	9·26	234	5
230	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	235	5
231	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	236	5
232	7·76	8·84	10·72 12·64	14·21	14·62	13·44	11·00	8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	237	6
233	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	238	6
234	6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54 6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	239	7
235	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06	5·50	5·18	240	7
236	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62 13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41	241	8
237	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	242	8
238	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26 8·61	6·50	5·32	5·38	243	9
239	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06	6·46	5·62	244	9
240	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	8·26	6·87	245	9
241	6·17	6·26	7·02 8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	11·74	10·42	8·87	7·44	246	10
242	6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	12·36	11·16	9·57	247	10
243	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28 14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	13·40	12·04	10·04	248	11
244	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44	12·80	249	11
245	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24 6·27	5·15	5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29	250	12
246	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	15·76	16·64	15·75	251	12
247	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87 14·22	16·50	17·05	15·47	252	13
248	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	253	13
249	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	254	13
250	16·10	13·81	10·56	7·46 5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	255	14
251	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	256	14
252	14·77	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10 12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	257	15
253	13·60	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	258	15

254	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48 8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	259 16
255	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	260 16
256	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64 8·34	9·42	10·67	261 17
257	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	262 17
258	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	263 17
259	9·68	11·56	13·16	14·03 14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04	264 18
260	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	265 18
261	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74 5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	266 19
262	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	267 19
263	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34 16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	268 20
264	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	269 20
265	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75 5·80	6·17	7·42	270 21
266	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	271 21
267	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87	7·56	272 21
268	7·92	8·94	10·67	12·44 13·74	13·97	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	273 22
269	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	274 22
270	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92	8·44 7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	275 23
271	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	276 23
272	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68 9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26	278 0
273	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	279 0
274	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15 15·62	12·54	280 1
275	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40	16·86	14·56	281 1
276	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	282 1
277	12·71	9·14	6·06	3·77	3·17 4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	283 2
278	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	284 2
279	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24 16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	285 3
280	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	286 3
281	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44 8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	287 4
282	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	288 4
283	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44 10·68	10·66	289 5
284	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	290 5
285	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	291 5
286	10·90	11·50	11·78	11·53	10·67 9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	292 6
287	11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	293 6
288	11·52	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52 10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	294 7
289	12·80	14·34	15·00	14·16	12·26	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	295 7
290	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76 8·61	6·02	4·24	3·86	5·14	7·32	10·15	296 8
Sum	767·08	766·50	757·45	761·02	729·94	707·88	695·14	698·96	725·36	744·78	791·32	778·57	782·39	787·15	787·51	788·20	771·88	750·72	725·21	723·00	753·41	751·06	783·80	765·56	No. of Days. 73d 8h.
No.	72	73	74	75	74	72	72	73	74	74	75	72	72	73	74	74	74	73	72	73	75	74	74	72	18093·89

FORMS FOR SHORT-PERIOD TIDES.

Series λ.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
291	13·10	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	297 8
292	11·37	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46	2·87	4·17	6·35 9·32	298 9
293	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	299 9
294	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	300 9
295	8·04	11·05	14·10	16·17	16·96	16·12 14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	301 10
296	9·03	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	302 10
297	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64 7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	303 11
298	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	304 11
299	7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48 12·55	12·87	12·46	11·36	9·70	8·28	7·14	305 12
300	6·80	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	306 12
301	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66 8·56	307 13
302	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	308 13
303	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	309 13
304	9·98	7·70	6·25	5·93	6·71	8·67 11·25	13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	310 14
305	9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	311 14
306	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40 8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	312 15
307	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	313 15
308	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90 9·14	11·80	14·20	15·72	15·81	14·66	12·72	314 16
309	10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52	12·80	14·44	15·18	14·68	13·32	315 16
310	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	14·18	14·40	13·64	316 16
311	12·37 10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	317 17
312	11·72	10·53	9·66	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	318 17
313	12·61	11·72	10·86	9·76	9·04	8·80	8·85 9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	319 18
314	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	320 18
315	13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23 12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	321 19
316	13·47	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	322 19
317	13·94	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10 7·27	7·36	8·22	9·82	11·76	13·33	323 20
318	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	324 20
319	13·88	14·74	14·20	12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	325 20
320	12·84 14·46	15·08	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	326 21
321	13·57	15·11	15·17	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	327 21
322	12·22	14·44	15·50	14·80	12·31	8·84	5·46 3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	328 22
323	12·76	14·67	15·26	14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	329 22
324	10·25	12·77	14·29	14·72	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86 11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	330 23
325	10·30	12·38	13·76	13·96	12·68	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	331 23

326	8·04	10·04	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77 11·77	10·06	8·23	6·86	6·34	6·56	333 0
327	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	334 0
328	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	335 0
329	5·72 5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	336 1
330	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	337 1
331	5·06	4·41	5·04	6·57	8·66	11·20	13·52 15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	338 2
332	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	339 2
333	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08 7·33	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	340 3
334	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	341 3
335	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58 14·48	14·07	12·12	9·32	6·72	342 4
336	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	343 4
337	5·93	4·58	4·74	6·03	8·20	10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	344 4
338	7·26	5·64 5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	345 5
339	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47	346 5
340	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56 13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	347 6
341	8·46	7·76	7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	348 6
342	10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54 9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	349 7
343	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	350 7
344	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	·	·	·	·	·	·	·	·	·	·	351 8
345	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	352 8
346	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	353 8
347	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	354 9
348	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	355 9
349	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	356 10
350	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	357 10
351	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	358 11
352	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	359 11
353	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	360 12
354	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	361 12
355	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	362 12
356	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	363 13
357	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	364 13
358	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	365 14
359	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	366 14
360	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	367 15
361	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	368 15
362	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	369 16
363	·	·	·	·	·	·	·	·	·	·	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	543·81	523·35	533·19	549·04	559·76	593·98	604·87	598·03	586·54	579·28	561·87	556·56	552·06	548·36	528·05	539·74	551·71	581·57	590·40	590·02	572·95	556·94	531·93	527·69	No. of Days.
No. {	57 / 76	55 / 75	54 / 74	54 / 73	54 / 73	56 / 75	57 / 76	55 / 76	54 / 74	54 / 73	54 / 72	56 / 74	56 / 74	56 / 75	53 / 73	53 / 72	53 / 72	55 / 74	55 / 74	54 / 74	53 / 74	53 / 72	53 / 72	55 / 74	54d 13h. / 73d 18h. / 13461·70

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - \frac{3}{2}\sigma - \frac{1}{2}\varpi + \eta)$. SERIES ν. Motion per mean Solar hour = 14°·2562915.

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70 15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	16·66	2 0
2	15·40	12·16	8·40	4·86	2·56 1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	16·63	16·96 15·24	3 2
3	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86 12·14	14·87	16·40	16·40	14·28	4 3
4	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68 6·10	5·05	5·25	6·68	9·24	12·28	14·51	15·96	15·58	13·48	5 4
5	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02 17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67	12·12	14·04	15·00	14·45	12·62	6 5
6	10·24	8·07	7·04	6·84	7·54 8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76	11·80	13·27	14·00	13·64	12·22 10·47	7 7
7	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82 11·16	12·55	13·24	13·07	12·20	11·16	8 8
8	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24 7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	9 9
9	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72 11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	12·20	10 10
10	11·24	10·48	10·12	10·05	10·23 10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58 11·38	11 12
11	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46 13·22	14·24	14·58	13·94	12·72	11·24	12 13
12	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62 5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	13 14
13	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80 9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	14 15
14	8·71	8·16	8·36	9·30	10·74 12·46	13·64	13·98	13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46 7·82	15 17
15	7·74	8·41	9·71	11·76	13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36 15·71	13·82	11·22	8·94	7·54	6·94	16 18
16	7·15	8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26 9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	17 19
17	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48 5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	18 20
18	7·60	9·84	12·14	14·06	14·84 14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26 8·16	19 22
19	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00 8·37	6·37	5·54	5·64	6·83	8·93	20 23
20	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30	7·70	9·76	12·17	14·36 15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	22 0
21	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01 7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	9·76	23 1
22	11·65	13·04	13·76	13·34 12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	6·68	7·86	9·46 11·24	24 3
23	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10 6·25	6·08	6·56	7·64	9·14	10·84	25 4
24	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66 13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78	8·55	10·33	26 5
25	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87 9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	27 6
26	12·63	14·53	15·56	15·33 13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76 10·55	13·50	28 8
27	15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	8·82	5·70	3·60 2·56	3·06	5·04	7·88	11·48	14·56	29 9
28	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28 14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	30 10
29	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02 8·40	11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	31 11
30	18·64	18·38	16·30	12·42 8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94 17·54	18·47	32 13
31	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44 6·36	9·36	12·84	15·86	17·74	17·94	33 14
32	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82 9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	34 15
33	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07 13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	35 16
34	13·02	10·16	7·86	6·27 5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44 13·11	11·12	36 18
35	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66 10·60	11·82	12·86	13·34	12·82	11·45	10·03	37 19

36	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34 10·07	9·97	9·77	9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	38 20
37	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00 11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76	9·97	39 21
38	9·00	8·00	7·11	6·58 6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	10·97 10·10	9·07	40 23
39	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01 9·76	10·58	11·25	11·66	11·34	10·36	8·82	42 0
40	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76 9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47	8·56	43 1
41	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67 14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	12·30	10·24	7·77	44 2
42	5·88	4·84	4·96	6·33 8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10 6·54	4·66	45 4
43	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07 14·56	14·85	13·63	10·90	7·86	5·57	4·07	46 5
44	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46 5·74	7·26	9·70	12·25	14·42	15·50	15·15	13·08	9·90	6·94	4·75	3·92	47 6
45	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00 11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	48 7
46	5·52	7·84	10·68	13·68 15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52 5·04	6·70	49 9
47	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	14·55	15·46	14·76 12·57	9·68	7·24	5·84	5·60	6·54	8·40	50 10
48	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87 10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	51 11
49	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90 5·18	4·58	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	52 12
50	11·68	13·36	14·16 14·12	12·82	10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67 9·76	11·20	53 14
51	12·50	13·18	13·06	11·88	10·25	8·57	6·98	5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16 11·07	10·02	8·94	8·44	8·48	9·27	10·44	54 15
52	11·57	12·34	12·34	11·70	10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	8·90 10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	55 16
53	10·87	11·93	12·44	12·26	11·27	9·76	7·96	6·27 5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	56 17
54	11·00	12·40	13·36 13·52	12·60	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18 7·03	8·83	11·00	57 19
55	12·96	14·40	14·74	13·76	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87 9·66	7·00	5·18	5·12	6·26	8·52	11·16	58 20
56	13·67	15·38	15·86	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16 16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	59 21
57	14·74	16·46	16·54	14·66	11·26	7·66	4·94	3·20 3·27	4·70	7·52	10·86	14·63	17·06	17·96	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	60 22
58	15·55	16·86	16·36 13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10 10·34	13·76	15·97	62 0
59	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26 4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02	63 1
60	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18 14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	15·64	64 2
61	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36 10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	65 3
62	13·92	12·03	10·14 8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44 13·56	13·74	12·74	66 5
63	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02 7·66	8·54	9·66	10·96	12·24	12·88	12·88	12·24	67 6
64	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36 10·18	8·87	7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	68 7
65	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76 11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	12·27	69 8
66	12·03	11·50	10·78 10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46 13·04	13·10	12·54	70 10
67	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	6·74	6·70 7·63	8·94	10·62	12·06	13·26	13·78	13·68	12·86	71 11
68	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57 9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·06	14·61	14·06	12·53	72 12
69	10·68	8·96	7·55	6·88	7·05	8·07	9·84 11·76	12·97	13·54	13·03	11·46	9·42	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	73 13
70	9·44	7·56	6·34 6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17 13·22	10·40	7·86	74 15
Sum	791·28	776·61	818·85	785·56	727·80	661·77	670·27	719·60	768·73	790·99	763·82	794·45	836·44	836·42	742·44	700·41	697·55	731·65	723·79	689·67	709·32	796·03	840·00	846·71	No. of Days. 73ᵈ 16ʰ.
No.	70	70	76	77	75	70	71	76	77	74	70	72	76	77	72	70	73	76	77	71	70	75	77	76	18320·16

FORMS FOR SHORT-PERIOD TIDES.

SERIES ν.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
71	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	8·94 11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	75 16
72	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67 4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	76 17
73	3·64	4·00	5·66	8·33	11·52	14·30	16·06 16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	77 18
74	3·22	4·26 6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06 4·83	3·54	3·76	78 20
75	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66 15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	79 21
76	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	7·06 7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	80 22
77	7·26	9·48	11·88	13·90	15·36	15·50	14·66 12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	81 23
78	7·75	9·52 11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40 6·43	6·30	6·68	7·68	83 1
79	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96 12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	84 2
80	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96 8·44	9·76	11·26	12·36	12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	85 3
81	8·34	10·26	12·20	13·86	15·00	15·14	14·16 12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	86 4
82	7·82	10·00 12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	6·93 5·38	5·00	5·82	7·83	87 6
83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16 14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	88 7
84	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72 9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	89 8
85	12·61	15·44	17·03	17·08	15·36	11·92	8·64 6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	90 9
86	13·66	16·10 17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93 7·22	9·26	12·02	14·66	91 11
87	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74 11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	92 12
88	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	14·00 15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	93 13
89	14·92	13·67	11·34	8·76	6·67	5·40	5·22 6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	94 14
90	13·84	12·27 10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95 11·96	12·80	12·96	12·28	95 16
91	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04 9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	96 17
92	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74 12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81	11·14	11·27	10·92	97 18
93	10·30	9·34	8·36	7·74	7·58	7·98	8·76 9·87	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	98 19
94	10·62	10·00 9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45 11·36	11·88	11·89	11·44	99 21
95	10·50	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72 7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	100 22
96	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56 14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	101 23
97	11·02	9·05	7·48	6·74	6·92	7·97 9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	103 0
98	10·95	8·28 6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36 16·20	15·32	13·00	9·88	104 2
99	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91 5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	105 3
100	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30 7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	106 4
101	6·14	5·06	5·57	7·24	10·07	13·10 15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	107 5
102	6·15 5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24 13·40	10·32	7·62	6·17	108 7
103	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67	9·40 12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	109 8
104	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	7·24	5·36 4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	110 9
105	7·11	7·83	9·54	11·58	13·16	13·74 13·28	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	111 10

106	7·54 8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66 12·26	10·62	9·10	8·03	7·66	112 12
107	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42 13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	113 13
108	6·96	7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52 6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	114 14
109	5·93	7·08	9·00	11·04	12·64	13·72 13·87	12·97	11·36	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	115 15
110	5·14 6·58	8·88	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10 9·16	6·48	4·70	4·20	4·74	116 17
111	6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96 14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	117 18
112	7·30	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97 6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	118 19
113	8·48	11·42	14·32	16·17	16·57	15·46 12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	119 20
114	9·52 12·56	14·92	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24 3·42	4·04	5·68	8·27	10·68	120 22
115	13·46	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45 13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	121 23
116	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86 9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	123 0
117	14·56	15·43	14·76	13·04	10·84	8·96 7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	124 1
118	14·60 14·86	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12 8·46	10·24	12·10	13·38	14·08	125 3
119	13·92	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26 7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	126 4
120	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34 10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54	127 5
121	13·24	12·12	10·96	9·98	9·27 8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	128 6
122	12·94 12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60 10·93	12·30	13·21	13·50	13·18	129 8
123	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20 8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	130 9
124	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	12·12 13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	131 10
125	12·24	9·97	7·60	5·85	4·92 5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10 11·76	132 12
126	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44 14·46	15·64	15·47	13·76	10·66	133 13
127	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57 5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	134 14
128	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69 17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	135 15
129	4·52	2·14	1·42	2·56	5·03 8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92 4·07	136 17
130	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34 15·47	15·07	12·82	9·66	6·56	4·08	137 18
131	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	6·11 7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	138 19
132	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86 11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	139 20
133	4·98	5·26	6·33	8·08	10·42 12·87	14·66	15·72	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84 6·28	140 22
134	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28 12·53	12·07	10·86	9·35	7·86	6·87	141 23
135	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93 7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	143 0
136	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82 9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	144 1
137	7·47	7·63	8·26	9·76	11·56 13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16 7·52	145 3
138	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22 14·76	13·34	11·12	9·16	7·84	7·36	146 4
139	7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16 8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	147 5
140	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58 4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	148 6
Sum	682·71	719·43	684·25	727·93	818·70	880·24	875·62	789·39	754·54	789·51	723·54	689·66	645·90	671·73	761·21	796·88	832·07	799·12	842·15	836·50	809·86	697·59	653·43	660·90	No. of Days. 73ᵈ 15ʰ.
No.	76	77	70	70	75	76	76	70	70	77	76	75	70	71	77	76	74	70	73	76	77	71	70	74	18142·86

FORMS FOR SHORT-PERIOD TIDES.

SERIES *ν*.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
141	8·20	9·70	11·80	13·62	14·54 14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74 8·92	149 8
142	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04	14·86	12·64 10·27	8·44	7·54	7·34	8·10	9·52	150 9
143	11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00	13·46 15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	151 10
144	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82 5·84	7·60	9·46	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	152 11
145	12·62	13·44	13·16	11·96	9·94 7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36 12·37	153 13
146	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38 8·08	8·30	9·20	10·24	11·40	12·12	154 14
147	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80 13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	11·83	155 15
148	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82 11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	156 16
149	11·97	11·72	11·06	9·98 8 86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·29	12·14 12·58	157 18
150	12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54 7·76	8·67	9·96	11·54	12·84	13·87	158 19
151	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86 12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28	13·22	14·76	15·82	159 20
152	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90 14·12	15·30	15·65	15·48	14·17	12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	160 21
153	16·85	15·70	13·60	11·52 9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48 17·54	17·17	161 23
154	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	9·46	6·32	4·44	3·62	4·30	6·30 8·54	11·95	15·02	17·28	17·95	17·20	163 0
155	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	11·87	8·16 5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53	17·65	164 1
156	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89 16·40	16·14	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	165 2
157	13 80	10·17	7·55	6·20 6·18	7·30	9·60	12·79	15·16	16·42	15·96	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95 16·07	12·81	166 4
158	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	16·05	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93 11·04	14·21	16·44	17·72	17·40	15·44	12·07	167 5
159	9·02	6·70	5·67	5·93	7·41	10·07	13·02	14·92	15·57	14·68	12·28	9·20	6·52	4·77 4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	168 6
160	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85 14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	169 7
161	8·61	6·86	6·32	6·58 7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66 10·40	8·31	170 9
162	7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04 13·70	14·74	14·75	13·73	12·02	10·10	8·46	171 10
163	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60 8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	172 11
164	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10 13·63	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	173 12
165	6·70	6·08	6·22	7·28 9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85 7·06	5·67	174 14
166	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	8 62	8·24	8·56	9·64	11·12	12·55 13·40	13·37	12·07	10·07	8·20	6·17	4·94	175 15
167	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77	12·06	10·27	8·84	8·10 7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	176 16
168	4·64	6·10	8·00	10·50	12·90	14·56	15·33	14·70 13·32	11·14	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	4·04	177 17
169	4·96	6·82	9·02	11·57 13·86	15·24	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94 4·22	5·70	178 19
170	7·84	10·40	12·82	14·74	15·56	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00 10·74	8·00	5·64	4·04	3·83	4·76	6·70	179 20
171	9·02	11·37	13·67	15·12	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42 10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	180 21
172	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01 7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	181 22
173	11·17	13·22	14·74 15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07 10·12	11·98	183 0
174	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	13·77	12·64	11·27	9·34	7·48 6·30	5·87	6·54	7·66	9·24	10·97	12·94	184 1
175	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19 12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56	8·50	10·00	11·48	13·23	185 2

176	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56 6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	186 3
177	13·98	13·72	12·51 10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37 11·82	13·16	13·66	187 5
178	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86 8·32	8·34	9·02	10·46	11·88	13·12	13·48	188 6
179	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	12·30	13·47 13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	189 7
180	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90 6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	190 8
181	13·69	12·32	10·27 7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54	11·60 13·35	14·38	14·34	191 10
182	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42 6·03	6·04	7·17	9·30	11·84	13·92	15·05	14·90	192 11
183	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55 15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	15·46	193 12
184	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70 10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46	16·44	15·54	194 13
185	12·76	8·60	5·17 2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56 16·37	15·10	12·10	195 15
186	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26 5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	196 16
187	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60 9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	197 17
188	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80 15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92	198 18
189	9·08	7·74	7·24 7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40 12·62	11·34	10·16	199 20
190	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24 8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	200 21
191	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77 8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	201 22
192	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78 13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	202 23
193	11·04	10·07	9·54 9·50	9·87	10·64	11·70	12·60	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14 13·28	12·08	10·74	204 1
194	9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94 10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	205 2
195	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31 5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	206 3
196	8·37	8·18	8·73	9·62	10·95	12·64	13·76 13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	207 4
197	8·04	8·20	8·78 9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77 8·67	7·57	7·18	208 6
198	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37 16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	209 7
199	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78	5·10	4·56	5·42 7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	210 8
200	8·16	10·14	12·46	14·24	14·84	13·50	10·90 8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	211 9
201	9·23	11·44 13·54	14·58	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77 6·54	7·96	9·86	212 11
202	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84 11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	213 12
203	12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37 13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	214 13
204	12·26	13·26	13·32	12·36	10·84	9·38	8·24 7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	215 14
205	12·05	12·96 13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73 7·66	9·04	10·52	12·10	216 16
206	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50 7·86	6·50	5·94	6·16	7·10	8·50	10·20	11·94	217 17
207	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62 13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46	8·25	10·24	12·44	218 18
208	14·18	15·26	15·50	14·64	12·94	10·78	9·16 8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	219 19
209	15·24	16·66 16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16 7·44	10·44	13·54	16·14	220 21
210	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	15·72	13·66	10·33 6·96	4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	221 22
211	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07 17·04	16·38	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	222 23
Sum	789·41	809·09	802·44	758·56	708·49	678·49	729·56	784·69	822·44	777·45	795·34	865·76	873·47	817·80	729·26	703·49	739·23	731·48	717·37	713·51	763·46	867·42	872·08	842·15	No. of Days. 74ᵈ 17ʰ.
No.	71	74	78	77	73	71	75	78	77	71	71	77	78	76	71	72	78	77	75	71	73	78	77	74	18692·44

FORMS FOR SHORT-PERIOD TIDES.

SERIES ν.—(*Continued*).

Day	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
212	18·50	17·76	14·76	10·60	7·27	5·06	4·48 5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	224 0
213	18·04	16·74 13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	4·58	7·04	10·14 13·35	16·16	17·52	17·26	225 2
214	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62 4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	226 3
215	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80 15·18	13·36	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	227 4
216	12·06	9·36	6·96	5·40	5·07	5·84	7·33 9·54	11·87	13·60	14·46	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	228 5
217	10·82	8·78 6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88 13·72	13·38	11·88	10·06	229 7
218	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67 9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	230 8
219	8·64	7·77	7·46	7·69	8·30	9·04	10·10	11·17	12·34	12·90	12·90 12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	231 9
220	9·44	8·35	7·66	7·57	8·12	9·06 10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	232 10
221	9·08	8·15 7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26 12·35	11·85	10·40	8·78	233 12
222	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84 9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	234 13
223	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64 11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27	235 14
224	5·96	5·56	6·35	7·80	9·76	11·70 13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	236 15
225	5·17 5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76 10·00	7·37	5·56	4·97	237 17
226	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83 13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	5·06	238 18
227	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35 5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	239 19
228	7·24	9·54	12·02	14·56	16·24	16·56 15·34	12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	240 20
229	8·36 10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72 6·86	5·97	6·34	7·52	9·30	241 22
230	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	15·06 14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	242 23
231	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38	6·34 7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	244 0
232	12·24	13·73	14·44	13·86	12·25	10·02 8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	245 1
233	11·96 13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67 9·16	9·18	9·63	10·54	11·48	246 3
234	12·46	12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54 14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	247 4
235	12·02	12·84	12·98	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17 8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	248 5
236	12·00	13·14	13·74	13·40	12·04	10·04 7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	249 6
237	12·06 13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27 5·15	5·63	7·24	9·64	12·52	250 8
238	14·74	15·98	15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44 16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	251 9
239	15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70 12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	252 10
240	16·50	17·05	15·47	12·37	8·44	5·52 3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	253 11
241	16·86 16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94 6·16	9·14	12·45	15·42	16·68	254 13
242	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07 7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	255 14
243	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80 14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	256 15
244	13·46	11·46	9·44	8·00	7·36	7·56 8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	257 16
245	12·43 10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74 11·16	12·22	12·70	12·20	11·38	258 18
246	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52 7·14	7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	259 19

247	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91 10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	260 20
248	11·53	10·97	10·23	9·48	9·04 9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	261 21
249	12·04 10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86 12·34	13·24	13·55	13·17	12·08	262 23
250	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55 6·10	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	264 0
251	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44 12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	265 1
252	8·45	6·71	5·90	6·17	7·29 9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67 7·34	266 3
253	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76 15·26	13·46	10·67	7·88	5·74	267 4
254	4·48	4·66	6·00	8·44	11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65 8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	268 5
255	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52 7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	269 6
256	3·83	5·50	7·97	11·14	14·16 16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67 4·60	270 8
257	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·63	12·22	14·26	15·46	15·24	13·48 10·57	7·65	5·42	3·96	4·06	5·34	271 9
258	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56 14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	272 10
259	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87 7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	273 11
260	8·34	10·76	12·86	14·16	14·44 13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07 8·81	274 13
261	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92 8·44	7·14	6·37	6·38	7·34	8·76	275 14
262	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84 12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	276 15
263	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37 6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	277 16
264	9·72	11·97	13·90	15·26	15·99 15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36 9·62	278 18
265	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84 7·77	5·85	5·07	5·66	7·50	9·87	279 19
266	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38 16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	280 20
267	13·66	16·26	17·40	16·86	14·56	10·89	7·40	4·72	3·37 3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	281 21
268	14·62	16·82	17·12	15·72	12·71 9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74 15·12	282 23
269	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24 6·04	6·91	8·53	10·52	13·06	15·02	284 0
270	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32 14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	285 1
271	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85 10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	286 2
272	13·06	11·36	9·07	7·14 5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22 11·46	287 4
273	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08 9·61	10·14	11·01	11·52	11·46	10·73	288 5
274	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04 10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	289 6
275	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16 12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	290 7
276	10·57	10·03	9·26	8·44 7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50 11·78	11·53	291 9
277	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12 9·26	10·62	11·94	12·78	12·88	12·06	292 10
278	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00 8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	293 11
279	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66 14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	294 12
280	9·96	7·92	6·50	6·22 7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52 12·00	9·24	295 14
281	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15 13·10	15·67	16·78	16·26	14·16	11·00	8·32	296 15
Sum	840·73	786·15	738·93	740·84	775·03	753·94	688·49	681·39	736·85	783·00	812·76	757·39	765·96	826·76	826·65	784·56	712·35	707·19	739·00	748·65	744·34	712·16	751·51	793·05	No. of Days. 73^d 16^h.
No.	77	73	70	73	76	77	72	70	74	76	77	70	70	75	77	75	70	71	76	77	74	70	72	76	18207·68

FORMS FOR SHORT-PERIOD TIDES.

Series ν.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
282	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04 3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	7·71	297 16
283	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	14·81 11·87	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	298 17
284	5·94	6·04	7·36	9·64 12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85 6·76	5·94	299 19
285	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17 16·96	16·12	14·06	11·35	8·82	7·14	6·57	300 20
286	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00 6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	301 21
287	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54 6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	302 22
288	7·92	8·94	10·40	11·85 12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54 7·93	7·84	304 0
289	8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38 14·04	13·04	11·45	9·76	8·15	7·22	7·02	305 1
290	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40 8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	6·30	5·88	306 2
291	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26 8·61	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	307 3
292	5·86	7·79	10·12	12·66 14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22 4·10	5·32	308 5
293	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03 12·98	9·78	7·04	4·71	3·46	3·86	5·60	309 6
294	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67 11·25	13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	310 7
295	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20 7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	311 8
296	10·76	14·05	16·38	17·05 16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18 9·01	12·24	312 10
297	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	14·50	14·36	12·66	9·94	7·20 4·97	3·56	3·77	5·34	7·72	10·56	13·46	313 11
298	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52 14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	314 12
299	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56 7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52	12·80	14·44	315 13
300	15·18	14·68	13·32 11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91 14·18	14·40	316 15
301	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20 7·86	8·80	9·98	11·46	12·86	13·86	13·83	317 16
302	12·96	11·72	10·53	9·66	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01 10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	318 17
303	12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16 9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	319 18
304	12·64	11·84	10·76 9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41 13·07	13·16	12·84	320 20
305	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34 8·96	10·02	11·20	12·46	13·23	13·47	13·00	321 21
306	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10 11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	13·94	13·04	322 22
307	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80 11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87	323 23
308	10·56	7·98	5·77 4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74 14·20	12·26	9·36	325 1
309	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36 8·12	10·44	12·84	14·46	15·08	13·97	11·41	8·07	326 2
310	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86 7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	15·17	13·27	9·96	6·40	327 3
311	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66 17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	14·80	12·31	8·84	5·46	328 4
312	3·00	1·66	2·20 4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	14·67	15·26	14·06	11·32 8·05	5·16	2·94	329 6
313	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25 12·77	14·29	14·72	13·33	10·74	7·81	5·32	3·66	330 7
314	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47 6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	12·68	10·56	8·18	6·28	4·97	331 8
315	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80 14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	332 9
316	5·96	6·50	7·80 9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14 8·60	7·52	7·06	333 11

317	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45 11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	334 12
318	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68 5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	335 13
319	7·90	8·54	9·72	11·26	12·78	13·82	14·20 13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97	7·94	336 14
320	7·68	8·24	9·50 11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86 9·00	7·82	7·54	337 16
321	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54 16·11	16·34	15·17	12·88	10·26	8·38	7·53	7·40	338 17
322	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05 5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	339 18
323	8·31	10·05	12·02	13·86	14·76	14·17	12·16 8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	340 19
324	9·02	10·97 12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37 7·26	8·12	9·82	341 21
325	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80 13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	342 22
326	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34 12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	343 23
327	13·03	13·80	13·45	11·78	9·47	7·26	5·64 5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	345 0
328	12·67	13·00 12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80 8·82	10·22	11·48	12·26	346 2
329	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72 8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	347 3
330	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	10·05	11·60	13·13	14·20 14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	348 4
331	11·62	11·14	10·38	9·49	8·78	8·48	8·71 9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	349 5
332	11·74	11·57 10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85 10·11	11·13	11·95	12·42	350 7
333	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	.	.	.	.	.	.	.	.	.	.	351 8
334	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	352 9
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346	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	365 0
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350	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	369 5
351	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	...	...	...	...	370 2
Sum	479·15	535·61	575·11	611·05	577·88	584·12	613·64	623·08	557·65	499·96	483·21	522·49	560·63	516·09	530·96	559·39	652·61	659·66	582·64	559·17	546·27	558·67	512·06	465·31	No. of Days.
No. {	52/70	55/77	58/76	56/74	52/70	52/73	56/76	58/76	55/73	52/70	52/74	57/76	59/77	53/71	51/70	51/75	57/76	57/76	51/70	51/70	53/75	57/75	56/74	51/69	54ᵈ 6ʰ. 73ᵈ 11ʰ. 13366·41

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - 2\sigma + \eta)$. SERIES μ or 2MS. Motion per mean Solar hour = $13^{\circ}\cdot9841042$.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28 4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31 14·16	16·06	16·66	15·40	2 1
2	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58 18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	16·63	16·96	15·24	3 2
3	11·93 8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77 6·90	5·23	4·96	6·16	8·86	12·14	14·87	16·40	16·40	14·28	11·00	4 4
4	7·63	4·88	3·55	3·86 5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24 12·28	14·51	15·96	15·58	13·48	10·47	7·54	5 6
5	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02 17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67	12·12	14·04	15·00	14·45	12·62 10·24	8·07	7·04	6 8
6	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11 8·00	6·64	6·17	6·55	7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	7 9
7	8·46 9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7·40	8·29 9·82	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	8 11
8	9·90	10·60	11·70	12·96	14·02 14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	7·34	8·07	9·14	10·55	11·74	12·48 12·66	12·27	11·60	10·93	10·34	9·98	9·86	9 13
9	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43 9·14	7·97	7·14	6·75	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48 10·12	10·05	10·23	10 15
10	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44 7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	11 16
11	10·44 11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22 14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	12 18
12	11·48	12·46	13·04	12·84	11·88 10·23	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58 9·35	8·75	8·76	9·26	10·34	11·68	13 20
13	12·96	13·64	13·36	11·80	9·66	7·32	5·82	5·14 5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30 10·74	12·46	13·64	14 22
14	13·98	13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82 16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	15 23
15	14·09	12·44 9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94 7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	13·84	17 1
16	11·50	8·60	5·94	4·37	4·02 5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32 11·40	13·55	14·80	14·78	13·22	10·43	18 3
17	7·48	5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15 16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06	14·84	14·14	12·06 9·06	6·46	19 5
18	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50 7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	20 6
19	4·87	5·06 6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93 11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	21 8
20	6·30	7·70	9·76	12·17	14·36	15·74 15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	11·76	13·36	14·14	13·72 12·06	9·94	8·32	7·22	7·01	7·74	22 10
21	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14 7·34	6·17	6·00	6·68	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14 8·68	9·86	23 12
22	11·56	13·36	14·36	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	6·68	7·86 9·46	11·24	12·66	13·36	13·34	13·38	11·08	9·94	9·11	8·88	9·28	10·22	24 13
23	11·70	13·06 14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	6·56	7·64	9·14	10·84	12·34	13·44 13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	25 15
24	12·40	13·38	13·66	13·03	11·87	10·24 8·47	7·00	5·83	5·38	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06 9·11	8·87	9·40	10·46	11·87	26 17
25	12·94	13·44	13·33	12·40	10·74	8·86	6·83	5·22	4·41	4·77 6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53 11·24	12·70	27 19
26	13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50 15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	28 20
27	14·55	15·08	14·17 11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96 8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	29 22
28	16·28	14·96	12·18	8·44	5·42	3·22 2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02 8·40	11·85	14·65	16·52	16·84	31 0
29	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·60	10·10	13·98 17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	16·86 14·76	32 2
30	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66	14·67 11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	33 3
31	10·16	6·82	4·54 3·58	4·44	6·36	9·36	12·84	15·80	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26 7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66	34 5
32	6·90	5·42	5·14	6·20	8·06	10·66	13·66 16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07	13·60	15·16 15·34	14·06	11·68	9·04	7·34	35 7
33	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02 10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26 7·92	36 9
34	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11	11·12	9·30	7·54	6·26	6·13	6·68 7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	37 10
35	9·26	9·66	10·60	11·82 12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34 11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	38 12

36	9·94	10·44	11·32	12·06	12·26	11·78	10·88 9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12 10·57	10·07	9·70	9·70	39 14
37	10·13	10·80	11·27	11·45	11·25	10·76	9·97	9·00	8·00	7·11	6·58 6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17 9·56	40 16
38	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16 11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	41 17
39	9·76	10·58	11·25	11·66 11·34	10·36	8·82	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30 10·76	9·26	8·14	7·84	8·12	8·96	10·24	42 19
40	11·52	12·40	12·66	12·07	10·47	8·56	6·64 5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53 8·16	9·56	11·03	12·66	43 21
41	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66 13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	44 22
42	14·38 13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78 12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	14·56	14·85	46 0
43	13·63	10·90	7·86	5·57 4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74 7·26	9·70	12·25	14·42	15·50	15·15	13·08	47 2
44	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60 15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66 14·46	11·76	8·44	48 4
45	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15 10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	49 5
46	5·38 4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07 7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	50 7
47	5·60	6·54	8·40	10·77	13·32 15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	10·40	12·80	14·50 15·06	14·03	11·86	9·36	7·58	6·64	6·76	51 9
48	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86 9·24	6·90	5·18	4·58	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05 7·40	7·66	8·58	52 11
49	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92	5·44 6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	53 12
50	9·76 11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98	5·77	5·38	5·64	6·37	7·82	9·54	11·17 12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	54 14
51	10·44	11·57	12·34	12·34	11·70 10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86 10·27	8·88	8·08	7·87	8·42	9·56	55 16
52	10·87	11·93	12·44	12·26	11·27	9·76	7·96	6·27 5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21 7·64	9·18	11·00	56 18
53	12·40	13·36	13·52	12·60	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84 11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	57 19
54	12·96	14·40 14·74	13·76	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84 12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	58 21
55	15·38	15·86	14·57	11·93	8·26 5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16 4·32	5·84	8·66	11·92	14·74	16·46	59 23
56	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52 10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55 16·86	16·36	61 1
57	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40 15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76	15·76	62 2
58	12·96	9·44 6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56 3·86	5·60	8·27	11·55	14·34	16·02	16·28	14·66	11·66	63 4
59	8·60	6·46	5·26	5·46	6·56	8·86 11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24 14·39	15·64	15·33	13·25	10·46	8·22	64 6
60	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71 12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14 8·54	7·56	65 8
61	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84 6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	66 9
62	9·27	9·77	10·46 11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66	10·96 12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	67 11
63	10·47	10·86	11·44	12·02	12·40	12·24 11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74 11·26	10·87	10·56	10·36	10·22	68 13
64	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98 7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78	10·20	9·73 9·58	9·87	69 15
65	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97 10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	70 16
66	9·88	10·74	11·40 11·75	11·70	11·14	10·07	8·84	7·56	6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68 12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	71 18
67	10·86	12·06	12·78	12·56	11·57	9·92 8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55 6·88	7·05	8·07	9·84	11·76	72 20
68	12·97	13·54	13·03	11·46	9·42	7·27	5·74	5·30	5·90	7·44 9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96 14·26	73 22
69	14·55	13·37	11·16	8·45	6·26	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86 15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	74 23
Sum	789·10	761·54	724·19	701·96	720·79	713·01	694·59	734·49	733·71	750·75	771·98	782·62	788·62	754·95	752·98	774·99	755·78	779·99	795·27	793·64	785·61	820·56	819·36	793·54	No. of Days. $74^d\ 0^h$.
No.	75	74	73	73	75	75	73	75	73	74	74	75	75	73	73	75	73	74	75	74	72	75	75	73	18294·02

FORMS FOR SHORT-PERIOD TIDES.

Series μ or 2MS.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
70	15·12	13·39	10·64 7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22 3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	76 1
71	12·86	9·54	6·67	4·92	4·38	5·52	7·55 10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30 16·06	16·52	15·06	12·13	77 3
72	8·73	6·13	4·66	4·99	6·53	8·92	11·86	14·66	16·40	16·56 15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83 8·00	78 5
73	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54 3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	79 6
74	6·12	6·08	7·14	9·00 11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31 13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	80 8
75	7·06	7·93	9·67	12·07	14·08	15·23	15·08 13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67 10·54	8·74	7·94	8·14	81 10
76	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86 5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72 9·12	82 12
77	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46 11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	83 13
78	9·84	10·96	12·05	12·86 12·96	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44 13·62	12·12	10·36	8·96	8·11	7·96	8·44	84 15
79	9·76	11·26	12·36	12·92	12·78	11·94	10·50 8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00 6·90	6·56	7·46	9·22	85 17
80	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17 7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	86 18
81	11·24 13·46	14·86	15·36	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72 16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	87 20
82	14·62	16·12	16·16	14·90 12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06 4·83	3·96	4·70	6·72	9·92	13·20	15·64	88 22
83	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64 6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00 14·10	16·43	17·34	90 0
84	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10 17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	91 1
85	15·64 12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84 4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74	92 3
86	11·68	8·84	7·02	6·48	7·04 8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73 11·37	14·00	15·82	16·34	15·34	13·10	10·40	93 5
87	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74 14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27 12·24	10·20	8·78	94 7
88	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47 5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	95 8
89	8·84 9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54 10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	96 10
90	9·54	9·90	10·56	11·44	11·92 12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60 11·86	11·07	10·34	9·94	9·77	9·87	97 12
91	10·02	10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36 7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91 9·47	9·34	9·52	98 14
92	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63 9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	99 15
93	9·48	10·45 11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82 13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	100 17
94	10·86	11·90	12·70	12·87	12·44 11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88 7·46	6·81	6·84	7·92	9·62	11·52	101 19
95	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92 7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84 12·16	14·02	102 21
96	15·18	15·06	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55 15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36	103 22
97	16·20	15·32 13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56 4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72	105 0
98	15·47	12·68	9·44	6·81	5·47	5·38 6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21 9·51	12·97	15·58	17·14	17·04	14·94	106 2
99	11·68	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40 16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91 14·37	10·87	107 4
100	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24 3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	108 5
101	7·62	6·17	6·07 7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67 9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	109 7
102	6·76	6·80	7·71	9·70	12·14	14·15 15·02	14·50	12·53	9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74 14·47	12·12	9·90	8·07	7·14	110 9
103	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60 5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74 7·82	7·54	111 11
104	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	6·60 7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	112 12

105	7·76	8·68	10·20 11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07 14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	113 14
106	7·85	9·40	10·96	12·36	13·06	13·12 12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64 8·60	6·78	5·94	5·93	7·08	114 16
107	9·00	11·04	12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62 6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58 8·88	115 18
108	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22 13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	116 19
109	11·77	14·02	15·57 15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92 7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	117 21
110	15·14	16·26	15·76	13·86	11·00	8·24	6·47 5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80 8·48	11·42	14·32	16·17	118 23
111	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90 13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36 16·28	120 1
112	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73 7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	121 2
113	13·50	10·52	8·22	6·72 6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88 6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	122 4
114	9·46	7·76	6·94	7·06	7·86	9·36	11·24 13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43 14·76	13·04	10·84	8·96	123 6
115	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28 6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14	8·84 8·15	124 8
116	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12 8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	125 9
117	8·56	9·00	9·74	10·55 11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78 13·40	12·16	10·87	9·94	9·24	8·96	8·94	126 11
118	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56 8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54	13·24	12·12	10·96	9·98 9·27	8·94	8·74	8·80	127 13
119	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04 8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	128 14
120	8·62 9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21 13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	129 16
121	10·00	11·40	12·36	12·92 12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74 8·97	7·34	6·24	5·98	6·71	8·26	10·20	130 18
122	12·12	13·50	14·27	13·67	12·20	10·16	8·55	7·53 7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42 8·60	10·95	13·28	131 20
123	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84 13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	132 21
124	15·96 16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66 7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	133 23
125	16·96	15·18	11·90	8·78	6·57 5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43 4·23	7·22	10·62	13·96	16·50	17·69	17·06	135 1
126	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90 13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97 17·83	16·77	14·06	136 3
127	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48 6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	137 4
128	10·00	7·30 5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88 4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	138 6
129	7·36	6·16	6·11	7·20	9·40 12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36 16·54	16·23	14·86	11·94	9·56	7·54	139 8
130	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66 9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78 9·46	7·72	6·96	140 10
131	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28 6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	6·86	141 11
132	6·52	6·83 8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86 13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	142 13
133	5·93	7·12	8·94	10·74	12·22 12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68 10·82	9·01	7·20	5·72	5·17	5·56	143 15
134	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12 8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84 5·46	7·38	144 17
135	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44 10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	4·46	4·54	5·90	7·82	145 18
136	10·17	12·67 14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	14·36	13·76 11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	11·03	146 20
137	13·46	15·10	15·52	14·67	12·94	10·67 8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13 5·24	7·24	9·70	12·30	14·40	147 22
138	15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20 9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60 15·42	16·13	149 0
Sum	800·65	786·16	769·81	790·17	781·19	761·18	763·01	755·73	755·50	728·19	738·55	730·58	696·54	703·17	732·62	734·36	737·45	760·70	772·33	754·56	798·87	810·38	798·35	793·41	No. of Days. 74d 1h.
No.	74	74	73	75	75	73	74	74	75	73	75	75	72	73	75	74	74	75	74	72	75	75	74	74	18253·46

FORMS FOR SHORT-PERIOD TIDES.

Series μ or 2MS.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
139	15·63	13·90	11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22 10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04	150 1
140	14·86	12·64	10·27 8·44	7·54	7·34	8·10	9·52	11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32 4·97	6·54	8·70	11·00	13·46	15·32	16·07	15·67	14·17	151 3
141	11·77	9·56	8·16	7·68	7·83	8·74 10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10 15·30	15·60	14·66	12·78	10·74	152 5
142	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96 9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84 10·00	8·46	153 7
143	7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94 6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	154 8
144	8·08	8·30	9·20 10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54 14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	155 10
145	8·60	9·36	10·36	11·26	11·83	12·05 11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74 10·42	9·26	8·54	8·34	8·46	156 12
146	9·23	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32 8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37 9·12	157 14
147	10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44 14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67	158 15
148	9·96	11·54	12·84 13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86 12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28	159 17
149	13·22	14·76	15·82	15·76	14·97	13·34	11·70 10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	12·02	9·86	8·00	7·09	6·85 7·72	9·34	11·40	13·77	160 19
150	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84 12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16	4·95	5·15	6·50	8·61	11·37	14·18 16·48	161 21
151	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33 12·77	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	162 22
152	17·95	17·20	15·02	11·76 9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	11·87	8·16	5·07	3·07 2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53	164 0
153	17·65	14·65	10·90	8·00	6·62	6·55	7·50 9·65	12·45	14·89	16·40	16·14	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48 16·44	18·12	18·40	17·00	165 2
154	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96 13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07 12·81	166 4
155	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	16·05	15·26	12·76	9·20	6·14	3·95 2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07	167 5
156	9·02	6·70	5·67	5·93 7·41	10·07	13·02	14·92	15·57	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67 14·34	16·42	17·20	16·60	14·54	11·30	8·66	168 7
157	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85 14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74 13·76	10·84	8·61	6·86	169 9
158	6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34	8·60 7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	170 10
159	6·60 6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30 12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53	171 12
160	6·70	7·50	9·03	10·90 12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10 13·34	11·84	10·05	8·26	6·94	6·44	6·67	172 14
161	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46 11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	6·70 6·08	6·22	7·28	173 16
162	9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	8·86 9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85	7·06	5·67	5·05	5·60	7·15	174 17
163	9·26 11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	8·62	8·24	8·56	9·64	11·12	12·55	13·40 13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	175 19
164	12·14	14·01	15·00	14·86	13·77 12·06	10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76 5·11	4·16	4·64	6·10	8·00	10·50	12·90	176 21
165	14·56	15·33	14·70	13·32	11·14	9·44	8·17	7·54 7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	9·02 11·57	13·86	15·24	177 23
166	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67 13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	7·84	10·40	12·82	14·74	15·56	179 0
167	15·33	13·80 11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64 4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12	15·46	14·48	180 2
168	12·44	9·96	8·16	6·86	6·42 6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	10·02 12·26	14·31	15·28	15·12	13·77	11·30	181 4
169	9·01	7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51 13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22 12·16	9·74	7·86	182 6
170	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70 5·02	5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	183 7
171	6·51	6·57 7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	9·24	10·97 12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	184 9
172	6·97	7·87	9·34	10·94	12·19 12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38 11·42	9·60	8·02	6·94	6·56	6·92	185 11
173	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48 7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48 6·84	7·86	186 13

174	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37 11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	187 14
175	8·72	10·36 11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96 11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	188 16
176	10·62	12·30	13·47	13·96	13·31	12·10 10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76 4·31	4·90	6·40	8·62	10·94	189 18
177	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62 8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	7·76	5·44	3·88	3·19	3·88	5·80	8·60 11·46	13·90	190 20
178	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54	11·60	13·35	14·38 14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	191 21
179	16·76	17·06	15·90 13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	15·05	14·90	13·08	9·91	6·43 3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	192 23
180	17·55	15·88	12·54	9·04	6·46	5·24 5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70 10·13	13·94	16·80	18·22	17·87	194 1
181	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46 16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38 17·46	14·77	195 3
182	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47 5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	196 4
183	10·58	7·04	4·79 4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97 9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26	197 6
184	6·86	5·22	4·84	5·76	8·06	10·85	13·97 15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34 15·86	14·11	11·28	8·50	6·30	198 8
185	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92 9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86 5·92	199 10
186	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86 9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	6·38	200 11
187	6·51	7·24	8·41 9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14 13·41	12·71	11·34	9·77	8·47	7·34	6·76	6·86	201 13
188	7·36	8·56	10·06	11·46	12·50	13·02	12·96 12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50	11·42	10·20	8·76 7·52	6·90	6·76	7·25	202 15
189	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07 9·54	9·50	9·87	10·64	11·70	12·60	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14 8·62	203 17
190	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	9·48	10·50	11·72 12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	204 18
191	10·96	13·07	14·58	15·07 14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24 9·13	7·31	5·74	5·33	6·10	7·65	9·76	13·02	205 20
192	14·00	15·20	15·33	14·58	12·97	11·01	9·35 8·37	8·18	8·73	9·62	10·95	12·64	13·76	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52 8·36	10·60	12·96	14·83	206 22
193	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82 13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	207 23
194	16·07 15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70 7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11	209 1
195	14·47	11·94	9·36	7·58 6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78	5·10	4·56	5·42	7·13 9·26	11·96	14·36	15·96	16·14	15·17	12·96	210 3
196	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46 14·24	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14 15·82	14·14	11·47	8·96	211 5
197	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84 7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	212 6
198	6·16 5·77	6·54	7·96	9·86	12·04	12·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61 10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	213 8
199	6·05	7·05	8·56	10·54 12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10 14·32	12·72	10·34	8·27	6·67	6·12	6·40	214 10
200	7·34	8·74	10·52	12·26	13·26	13·32	12·36	10·84 9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48 6·10	6·50	7·54	215 12
201	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04 9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	216 13
202	9·04 10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62 13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	217 15
203	10·20	11·94	13·44	14·14	14·16 13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	9·90	7·96 6·26	5·30	5·46	6·46	8·25	10·24	218 17
204	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16 8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98 7·77	10·32	13·02	219 19
205	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56 14·24	15·18	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	220 20
206	16·14	17·54 17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	15·72	13·66 10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	221 22
207	18·37	18·04	16·16	12·38	8·82 6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	16·38	13·96	10·25	6·47	3·74	2·56	3·20 5·12	8·18	11·74	15·30	17·66	18·50	223 0
Sum	806·79	806·60	812·33	806·72	792·57	775·12	796·98	810·84	774·19	807·97	796·20	756·78	762·42	753·69	737·14	694·92	718·68	717·71	707·38	744·73	779·56	769·99	790·25	806·92	No. of Days.
																									$74^d\ 0^h$.
No.	74	73	75	75	74	73	74	75	72	75	75	72	74	75	75	73	75	74	73	74	75	74	73	74	18526·48

FORMS FOR SHORT-PERIOD TIDES.

SERIES μ OR 2MS.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
208	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36 13·94	16·34	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94 17·78	18·04	16·74	224 2
209	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39 12·15	8·23	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	225 3
210	11·80	8·22 5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62	4·54	4·80 6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	226 5
211	7·62	5·16	4·10	4·64	6·45 8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12 15·66	15·72	14·46	12·06	9·36	6·96	227 7
212	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96 12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78 6·78	5·83	228 9
213	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90 9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	229 10
214	7·00	7·70 8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54 12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69	230 12
215	8·30	9·04	10·10	11·17	12·34	12·90 12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38 10·53	9·44	8·35	7·66	7·57	8·12	231 14
216	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45 10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24 7·70	8·54	232 16
217	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22	10·18	9·34	8·97	9·08	9·88 10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37	233 17
218	10·20	11·94	13·38 14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	13·30	13·42 12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	234 19
219	12·76	13·96	14·91	14·84	13·64	11·84 9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56 6·35	7·80	9·76	11·70	13·66	235 21
220	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84 10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00 15·02	15·96	236 23
221	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67 12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	238 0
222	15·32	13·08	10·11 7·72	6·36	6·10	6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	5·06 6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	239 2
223	11·38	8·34	6·35	5·46	5·74	7·13	9·22 11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56 16·24	16·56	15·34	12·80	9·60	240 4
224	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88 12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16 6·11	241 6
225	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34 7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	242 7
226	4·85	5·64	7·12 9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06 15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38	243 9
227	6·34	7·85	9·86	11·96	13·64	14·58	14·07 12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06 6·46	5·62	5·78	6·47	244 11
228	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84 8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	7·02 8·17	245 13
229	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48 12·46	12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21	6·66	7·76	246 14
230	9·20	10·76	12·36	13·54 14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	12·36	11·16 9·57	7·60	6·24	5·63	5·97	7·17	8·80	247 16
231	10·66	12·80	14·28	14·96	14·74	13·66	11·85 10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	13·40	12·04	10·04	7·64	5·76	4·78 5·02	6·24	8·16	10·78	248 18
232	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06 9·98	12·06	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	249 19
233	13·80 16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	9·64	12·52	14·74	15·98 15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	250 21
234	16·82	17·44	16·36	13·83 9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	15·76	16·64	15·75	12·94	9·26	6·06	3·66 2·67	3·72	5·66	8·70	12·20	15·53	17·33	251 23
235	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55 7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94 13·47	16·22	17·47	17·02	253 1
236	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86 16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	254 2
237	12·99 9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47 4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	255 4
238	7·87	5·34	3·84	3·92 5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58 12·80	14·58	15·36	14·73	12·52	9·86	7·17	256 6
239	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79 14·77	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02 8·73	6·90	5·70	257 8
240	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43	10·94	9·64	8·76 8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	258 9
241	6·67 7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87 10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	259 11
242	7·86	8·66	9·84	10·90	11·62 11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34 9·74	9·06	8·35	7·72	7·46	7·67	260 13

243	8·44	9·64	10·73	11·52	11·88	12·06	11·88	11·53 10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74 7·42	7·64	8·34	261 15
244	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42 8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	262 16
245	9·24	10·86 12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38 12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	9·68	263 18
246	11·56	13·16	14·03	14·06	13·18 11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90 5·75	5·50	6·36	8·04	10·20	12·32	264 20
247	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17 7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06 11·46	13·68	15·18	265 22
248	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	12·54	14·50 15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	266 23
249	15·26	13·46 10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20 4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	268 1
250	12·14	9·06	6·37	4·56	3·93	4·93 6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04 12·74	14·90	15·94	15·62	13·71	10·64	269 3
251	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01 16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14 8·87	6·16	270 5
252	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75 5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42	271 6
253	3·96	4·06 5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38 12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	272 8
254	4·61	5·87	7·97	10·37	13·07	14·81 15·06	14·13	12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83 8·83	7·10	5·78	5·25	5·76	273 10
255	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	10·86 9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06 6·30	7·07	274 12
256	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10 10·17	11·30	12·30	12·61	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	275 13
257	8·76	10·57	12·10 13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52 12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	276 15
258	9·84	11·56	13·26	14·17	14·66	14·52 13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58 6·74	5·94	6·30	7·68	9·72	277 17
259	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98 6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62 12·14	278 19
260	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45 15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	279 20
261	15·25	16·92	17·15 15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84 7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	280 22
262	17·40	16·86	14·56	10·89	7·40	4·72	3·37 3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54 8·77	11·76	14·62	16·82	17·12	282 0
263	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44 16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06 14·21	283 2
264	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36 7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	284 3
265	8·64	6·01	4·31 3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84 9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88	285 5
266	5·80	4·44	4·58	5·92	7·85	10·30	12·70 14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06 11·36	9·07	7·14	5·84	286 7
267	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82 10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36 6·44	287 9
268	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08 9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	7·66	7·41	7·56	288 10
269	8·04	8·76	9·91	11·17 12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66 10·30	9·78	9·22	8·56	8·06	7·74	8·02	289 12
270	8·86	10·06	11·16	12·02	12·40	12·34	12·06 11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	9·26 8·44	7·90	8·07	8·80	290 14
271	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23 8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56	7·77	8·55	291 15
272	9·74 11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62 11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	292 17
273	11·54	12·81	13·77	14·04 13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52 8·76	7·36	6·77	7·26	8·52	10·36	12·17	293 19
274	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64 5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	7·92	6·50	6·22	7·10 8·82	10·86	13·12	14·54	294 21
275	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80 14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	295 22
276	15·76 14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16	11·00 8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	297 0
Sum	772·62	751·66	767·12	757·22	732·52	765·92	777·83	762·45	808·90	813·02	803·52	799·98	806·10	791·47	744·97	751·18	718·14	720·00	728·12	723·82	739·64	741·67	751·35	756·37	No. of Days. 74ᵈ 0ʰ.
No.	74	74	75	74	72	74	75	73	75	75	73	73	75	75	73	75	73	74	74	74	75	73	74	74	18285·59

FORMS FOR SHORT-PERIOD TIDES.

Series μ or 2MS.—(*Continued*).

Day	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	Solar Hour	
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d*	*h*
277	13·28	9·87	6·84	4·45 3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	6·88 8·87	11·47	14·12	15·94	16·22	14·81	11·87	298	2
278	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00 15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60 13·70	10·52	7·15	299	4
279	4·66	2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67 8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	300	5
280	4·20 3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02 8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	301	7
281	4·23	5·00	6·80	9·02	11·88 14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86 12·57	10·68	8·54	6·84	5·56	5·27	302	9
282	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58 12·88	11·01	9·42	8·12	7·64	7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66 6·68	6·30	6·72	303	11
283	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93 7·84	8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	304	12
284	7·90	9·22 10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32 11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	305	14
285	8·84	10·74	12·56	13·87	14·54 14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30 10·26	8·61	7·37	6·86	7·24	8·35	306	16
286	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96 5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44 6·77	8·02	10·14	307	18
287	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10	5·32	7·70 10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	308	19
288	13·27	15·16 15·84	15·03	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38 12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	309	21
289	15·52	15·84	14·55	11·68	8·46	5·64 3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32 6·37	7·46	9·60	12·20	14·35	15·67	310	23
290	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60 10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76 15·16	13·92	312	1
291	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16 12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	14·50	14·36	12·66	313	2
292	9·94	7·20 4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86 6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	314	4
293	6·52	4·86	4·33	5·20	6·90	9·14 11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26 13·26	12·06	10·17	8·00	6·25	315	6
294	5·31	5·50	6·66	8·34	10·52	12·80	14·44	15·18	14·68 13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62 6·54	6·20	316	8
295	6·84	7·96	9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46 8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	317	9
296	7·86	8·80	9·98 11·46	12·86	13·86	13·83	12·96	11·72	10·53	9·66	9·14	8·92	8·96	9·17	9·66	10·40	11·10 11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	318	11
297	9·44	10·56	11·74	12·76	13·34	13·26 12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38 9·58	8·94	8·71	8·90	9·50	319	13
298	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88 8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38 10·38	320	15
299	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83 10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	10·02	321	16
300	11·20	12·46	13·23 13·47	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10 11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	322	18
301	13·14	13·94	13·94	13·04	11·34	9·30	7·45 5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27 7·36	8·22	9·82	11·76	13·33	323	20
302	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71 9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88 14·74	324	22
303	14·20	12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90 13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	325	23
304	13·97	11·41	8·07 4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65 5·46	6·44	8·40	11·20	13·57	15·11	15·17	13·27	327	1
305	9·96	6·40	3·62	1·76	1·54	3·26	6·02 9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44 15·50	14·80	12·31	8·84	328	3
306	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82 14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	14·67	15·26	14·06	11·32	8·05 5·16	329	5
307	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16 5·50	5·88	7·64	10·25	12·77	14·29	14·72	13·33	10·74	7·81	5·32	330	6
308	3·66	3·26	4·42	6·34 8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38 13·76	13·96	12·68	10·56	8·18	6·28	4·97	331	8
309	4·83	5·73	7·34	9·38	12·05	14·37	15·76 15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	12·24	10·73 8·96	7·30	6·24	5·96	332	10
310	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23 6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	333	11
311	7·44 8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32 8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	334	13

312	8·64	10·02	11·65	13·16 14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88 13·62	12·36	10·67	9·06	8·12	7·90	8·54	335 15
313	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05 7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97 7·94	7·68	8·24	9·50	336 17
314	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04 6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	337 18
315	11·14 12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11 16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	338 20
316	13·36	14·60	14·56	12·94	10·26 7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81 8·08	7·33	7·37	8·31	10·05	12·02	13·86	339 22
317	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64 6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97 12·94	14·40	14·70	341 0
318	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56 16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	342 1
319	12·12 9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32 7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	343 3
320	8·06	5·93	4·58	4·74	6·03 8·20	10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50 13·03	13·80	13·45	11·78	9·47	7·26	344 5
321	5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17 15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36 8·34	6·54	5·59	345 7
322	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66 7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	346 8
323	6·75	7·83 9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36 10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	347 10
324	8·95	10·05	11·60	13·13	14·20 14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14 10·38	9·49	8·78	8·48	8·71	9·47	348 12
325	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17 8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10 9·74	10·90	349 14
326	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86 8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	350 15
327	11·97	12·94 13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50 13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	11·57	351 17
328	12·76	13·30	13·22	12·46	11·00	9·17 7·18	5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	10·77	9·04 7·98	7·73	8·23	9·70	11·40	12·74	352 19
329	13·42	13·45	12·54	10·80	8·50	6·30	4·47	3·64	4·12 5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80 13·38	14·33	353 21
330	14·26	13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74 16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	15·14	354 22
331	15·03	13·10 10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74 7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	15·20	356 0
332	12·64	9·26	5·91	3·10	1·55	1·93 4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14 13·10	15·24	16·17	14·94	12·16	357 2
333	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00 17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	15·86	14·14 10·98	7·68	358 4
334	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	17·88	16·62	13·58	9·97 6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	359 5
335	4·73	3·07	3·08 4·74	6·97	9·86	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03 10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	360 7
336	4·33	4·63	5·97	8·02	10·57	13·25 15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	8·60	10·76	12·74	13·74	13·62 12·37	10·30	8·14	6·53	5·84	361 9
337	6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86 8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33 7·28	362 11
338	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70 6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	8·24	363 12
339	8·54	9·54	11·12 12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10 13·01	13·12	12·46	11·26	10·02	9·06	8·58	8·66	364 14
340	9·44	10·68	11·96	12·92	13·14	12·66	11·54 10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57 10·28	9·14	8·62	8·63	9·20	365 16
341	10·44	11·66	12·53	12·92	12·58	11·64	9·77	7·86	6·12	5·05 4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24	8·62 9·76	366 18
342	11·04	12·36	13·08	12·90	11·65	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43 14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	367 19
343	11·70	12·96	13·58 13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	15·17	13·56 11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	368 21
344	13·46	13·82	12·72	10·52	7·90	5·74	4·34 4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97 9·38	11·36	13·14	14·17	369 23
345	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	700·30	724·13	717·75	679·85	724·83	733·43	735·74	760·51	768·13	744·32	744·70	774·97	777·25	756·28	772·11	764·56	786·66	770·57	787·08	781·80	747·09	739·75	729·35	706·79	No. of Days. 73d 2h.
No.	73	75	75	71	73	74	73	73	74	72	71	74	74	72	73	72	74	72	74	74	72	73	73	73	17928·95

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

SERIES R.

Argument $(\gamma - \frac{1}{2}\eta)$. Motion per mean Solar hour = 15°·0205343.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	1 23
2	16·66	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	2 23
3	16·63	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	3 23
4	14·87	16·40	16·40	14·38	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	4 23
5	12·28	14·51	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	5 23
6	9·67	12·12	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	6 23
7	7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7 23
8	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	8 23
9	7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	9 23
10	7·14	6·75	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	10 23
11	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	11 23
12	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	12 23
13	10·23	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	13 23
14	11·80	9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	14 23
15	13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	15 23
16	14·09	12·44	9·76	7·00	5·12	4·20	—	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	16 22
17	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	17 22
18	13·55	14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	18 22
19	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	19 22
20	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	20 22
21	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	21 22
22	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	22 22
23	6·68	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	23 22
24	6·09	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	24 22
25	6·25	6·08	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	25 22
26	7·00	5·83	5·38	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	26 22
27	8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	27 22
28	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	28 22
29	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	29 22
30	16·28	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	30 22
31	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	31 22
32	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	32 22
33	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	33 22
34	10·66	13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	34 22
35	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	35 22

36	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11	11·12	9·30	7·54	6·26	6·13	36 22
37	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	37 22
38	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	38 22
39	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76	9·97	9·00	39 22
40	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	10·97	10·10	40 22
41	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	41 22
42	10·36	8·82	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	42 22
43	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	43 22
44	13·60	12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	44 22
45	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	45 22
46	14·56	14·85	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	——	8·00	6·17	5·46	5·74	7·26	9·70	46 21
47	12·25	14·42	15·50	15·15	13·08	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	47 21
48	10·54	13·30	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	48 21
49	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	49 21
50	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	50 21
51	5·80	7·87	10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	51 21
52	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	52 21
53	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98	53 21
54	5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	54 21
55	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	12·26	11·27	55 21
56	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	56 21
57	12·60	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	57 21
58	14·74	13·76	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	58 21
59	15·38	15·86	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	59 21
60	14·74	16·46	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	60 21
61	12·86	15·55	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	61 21
62	10·34	13·76	15·97	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	62 21
63	8·27	11·55	14·34	16·02	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	63 21
64	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	64 21
65	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	65 21
66	6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	66 21
67	7·02	7·66	8·54	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	67 21
68	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	68 21
69	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	69 21
70	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	70 21
71	11·14	10·07	8·84	7·56	6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	71 21
72	12·56	11·57	9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	72 21
73	13·54	13·03	11·46	9·42	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	73 21
74	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	74 21
Sum	767·64	795·61	794·06	763·88	717·33	666·62	622·12	613·15	634·65	688·92	766·40	851·29	923·85	967·47	976·31	947·28	888·49	804·19	735·85	673·17	640·65	639·83	668·92	717·19	No. of Days.
No.	74	74	74	74	74	74	73	74	74	74	74	74	74	74	74	74	74	73	74	74	74	74	74	74	73d 22h. 18264·87

FORMS FOR SHORT-PERIOD TIDES.

Series R.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
75	13·95	15·20	15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	75 21
76	13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	76 21
77	11·52	14·30	16·06	16·52	———	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	77 20
78	6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	78 20
79	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	79 20
80	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	80 20
81	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	81 20
82	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	82 20
83	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	83 20
84	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26	12·36	12·92	12·78	84 20
85	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	85 20
86	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	86 20
87	14·86	15·36	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	87 20
88	14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	88 20
89	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	89 20
90	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	90 20
91	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	91 20
92	7·24	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	92 20
93	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	93 20
94	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	94 20
95	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	95 20
96	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	10·36	9·16	8·12	96 20
97	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81	11·14	11·27	10·92	10·30	9·34	97 20
98	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	98 20
99	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	99 20
100	11·44	10·50	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	12·70	100 20
101	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	101 20
102	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	102 20
103	14·02	15·18	15·06	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	103 20
104	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	104 20
105	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	105 20
106	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	106 20
107	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97	———	16·50	15·10	12·22	8·67	5·24	3·17	2·56	107 19
108	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	108 19
109	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	7·24	5·36	109 19

110	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60	110 19
111	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	111 19
112	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	112 19
113	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85	9·40	10·96	12·36	13·06	113 19
114	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	114 19
115	13·72	13·87	12·97	11·36	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	115 19
116	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	116 19
117	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	117 19
118	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	118 19
119	8·48	11·42	14·32	16·17	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	119 19
120	6·96	9·52	12·56	14·92	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	120 19
121	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	121 19
122	4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	122 19
123	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76	13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	123 19
124	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	124 19
125	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	125 19
126	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	126 19
127	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	127 19
128	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	128 19
129	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	12·36	129 19
130	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	12·12	130 19
131	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	131 19
132	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	132 19
133	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	133 19
134	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	134 19
135	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	135 19
136	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	136 19
137	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	137 19
138	2·88	4·46	6·78	——	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	138 18
139	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	139 18
140	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	140 18
141	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	141 18
142	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	142 18
143	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	143 18
144	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	144 18
145	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	4·46	4·54	5·90	7·82	145 18
146	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	146 18
147	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	147 18
148	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	148 18
Sum	677·15	754·91	822·66	856·51	861·67	863·83	828·80	782·65	743·51	724·16	729·96	758·66	804·03	851·91	887·95	899·21	857·45	815·32	734·97	653·54	588·64	554·03	559·85	600·82	No. of Days.
No.	74	74	74	73	73	74	74	74	74	74	74	74	74	74	74	74	73	74	74	74	74	74	74	74	$73^d\ 21^h$. 18212·19

FORMS FOR SHORT-PERIOD TIDES.

SERIES R.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
149	6.00	8.33	10.94	13.60	15.42	16.13	15.62	13.90	11.47	9.28	7.84	7.40	7.74	8.92	10.62	12.60	14.02	14.27	13.22	10.78	8.10	5.76	4.27	4.17	149 18
150	5.26	7.20	9.70	12.28	14.66	15.94	16.04	14.86	12.64	10.27	8.44	7.54	7.34	8.10	9.52	11.55	13.36	14.27	13.92	12.06	9.48	6.90	5.12	4.32	150 18
151	4.97	6.54	8.70	11.00	13.46	15.32	16.07	15.67	14.17	11.77	9.56	8.16	7.68	7.83	8.74	10.50	12.26	13.66	14.02	12.96	10.86	8.34	6.24	5.04	151 18
152	4.82	5.84	7.60	9.46	11.87	14.10	15.30	15.60	14.66	12.78	10.74	9.03	7.96	7.73	8.24	9.44	11.07	12.62	13.44	13.16	11.96	9.94	7.67	6.16	152 18
153	5.18	5.56	6.86	8.64	10.66	12.74	14.30	15.12	15.06	13.65	11.84	10.00	8.46	7.75	7.78	8.46	9.92	11.36	12.37	12.84	12.22	10.98	9.18	7.32	153 18
154	6.03	5.94	6.87	8.17	9.67	11.58	13.28	14.64	14.97	14.22	12.62	11.08	9.47	8.38	8.08	8.30	9.20	10.24	11.40	12.12	12.46	11.72	10.38	8.77	154 18
155	7.37	6.70	6.93	7.78	8.83	10.30	11.90	13.54	14.68	14.80	13.77	12.16	10.50	9.20	8.47	8.28	8.60	9.36	10.36	11.26	11.83	12.05	11.56	10.60	155 18
156	9.20	8.14	7.72	7.83	8.62	9.82	11.10	12.64	13.94	14.46	14.16	13.26	11.74	10.42	9.26	8.54	8.34	8.46	9.23	10.10	10.93	11.70	11.97	11.72	156 18
157	11.06	9.98	8.86	8.32	8.36	9.00	10.04	11.54	12.92	13.86	14.25	13.85	12.88	11.48	10.08	8.98	8.20	8.20	8.37	9.12	10.03	11.29	12.14	12.58	157 18
158	12.36	11.84	11.02	10.06	9.23	8.78	9.20	10.37	11.98	13.44	14.22	14.34	13.94	12.86	11.59	10.03	8.74	7.92	7.54	7.76	8.67	9.96	11.54	12.84	158 18
159	13.87	13.86	13.28	12.03	10.56	9.66	9.64	10.17	11.38	12.77	13.98	14.67	15.14	14.88	13.86	12.46	10.48	8.82	7.82	7.50	8.19	9.46	11.28	13.22	159 18
160	14.76	15.82	15.76	14.97	13.34	11.70	10.67	10.27	10.56	11.52	12.90	14.12	15.30	15.65	15.48	14.17	12.02	9.86	8.00	7.09	6.85	7.72	9.34	11.40	160 18
161	13.77	15.84	16.86	16.85	15.70	13.60	11.52	9.95	9.55	9.80	10.84	12.57	14.21	15.47	16.06	15.22	13.50	10.84	8.22	6.16	4.95	5.15	6.50	8.61	161 18
162	11.37	14.18	16.48	17.54	17.17	15.60	12.50	10.07	8.34	8.17	8.96	10.27	12.23	14.24	15.74	16.29	15.33	12.77	9.46	6.32	4.44	3.62	4.30	6.30	162 18
163	8.54	11.95	15.02	17.28	17.95	17.20	15.02	11.76	9.04	7.44	7.22	7.81	9.55	12.08	14.54	16.07	16.21	14.76	11.87	8.16	5.07	3.07	2.74	3.80	163 18
164	5.94	9.24	12.80	15.92	18.07	18.53	17.65	14.65	10.90	8.00	6.62	6.55	7.50	9.65	12.45	14.89	16.40	16.14	14.28	10.90	7.10	4.31	2.62	2.37	164 18
165	3.68	6.30	9.76	13.48	16.44	18.12	18.40	17.00	13.80	10.17	7.55	6.20	6.18	7.30	9.60	12.79	15.16	16.42	15.96	13.80	10.33	6.77	4.00	2.33	165 18
166	2.54	4.18	7.11	10.40	13.95	16.74	17.85	17.95	16.07	12.81	9.60	7.05	5.72	5.77	7.00	9.56	12.80	15.12	16.05	15.26	12.76	9.20	6.14	3.95	166 18
167	2.88	3.47	5.52	7.93	11.04	14.21	16.44	17.72	17.40	15.44	12.07	9.02	6.70	5.67	5.93	7.41	10.07	13.02	14.92	15.57	14.68	12.28	9.20	6.52	167 18
168	4.77	4.20	4.94	6.52	8.80	11.67	14.34	16.42	17.20	16.60	14.54	11.30	8.66	6.74	—	6.05	6.16	7.65	10.05	12.50	14.32	14.85	14.05	11.96	168 17
169	9.47	7.26	6.06	5.80	6.39	7.66	9.64	11.92	14.25	15.90	16.46	15.74	13.76	10.84	8.61	6.86	6.32	6.58	7.80	9.82	12.04	13.55	14.17	13.54	169 17
170	12.03	10.34	8.60	7.57	7.26	7.62	8.44	9.92	12.12	14.20	15.46	15.54	14.58	12.66	10.40	8.31	7.04	6.60	6.77	7.78	9.32	11.22	12.80	13.58	170 17
171	13.46	12.40	10.90	9.62	8.66	8.31	8.49	9.03	10.30	12.04	13.70	14.74	14.75	13.73	12.02	10.10	8.46	7.12	6.53	6.70	7.50	9.03	10.90	12.32	171 17
172	13.20	13.38	12.92	11.94	10.67	9.60	8.94	8.82	9.24	10.33	11.90	13.24	14.06	14.10	13.34	11.84	10.05	8.26	6.94	6.44	6.67	7.49	9.06	10.86	172 17
173	12.50	13.66	14.10	13.63	12.46	11.06	10.06	9.30	9.05	9.33	10.22	11.60	12.90	13.82	13.85	13.08	11.64	9.76	8.00	6.70	6.08	6.22	7.28	9.00	173 17
174	10.94	12.77	14.05	14.63	14.17	12.86	11.33	10.04	9.14	8.86	9.20	10.08	11.26	12.44	13.30	13.52	12.80	11.00	8.85	7.06	5.67	5.05	5.60	7.15	174 17
175	9.26	11.30	13.28	14.45	14.84	13.95	12.40	10.90	9.46	8.62	8.24	8.56	9.64	11.12	12.55	13.40	13.37	12.07	10.07	8.20	6.17	4.94	4.74	5.62	175 17
176	7.74	9.76	12.14	14.01	15.00	14.86	13.77	12.06	10.27	8.84	8.10	7.94	8.52	9.68	11.18	12.64	13.37	13.05	11.52	9.17	6.76	5.11	4.16	4.64	176 17
177	6.10	8.00	10.50	12.90	14.56	15.33	14.70	13.32	11.14	9.44	8.17	7.54	7.57	8.34	9.81	11.65	13.20	13.60	12.56	10.40	7.97	5.83	4.38	4.04	177 17
178	4.96	6.82	9.02	11.57	13.86	15.24	15.44	14.56	12.56	10.36	8.63	7.62	7.30	7.74	8.86	10.67	12.47	13.67	13.60	12.02	9.66	6.93	4.96	3.94	178 17
179	4.22	5.70	7.84	10.40	12.82	14.74	15.56	15.33	13.80	11.44	9.35	7.79	7.04	7.03	7.90	9.44	11.66	13.22	13.92	13.00	10.74	8.00	5.64	4.04	179 17
180	3.83	4.76	6.70	9.02	11.37	13.67	15.12	15.46	14.48	12.44	9.96	8.16	6.86	6.42	6.94	8.42	10.44	12.57	13.67	13.68	12.22	9.64	6.86	4.96	180 17
181	3.98	4.36	5.65	7.72	10.02	12.26	14.31	15.28	15.12	13.77	11.30	9.01	7.37	6.64	6.56	7.46	9.06	11.01	12.70	13.51	13.01	11.07	8.44	6.12	181 17
182	4.72	4.42	5.32	6.94	8.97	11.17	13.22	14.74	15.17	14.22	12.16	9.74	7.86	6.74	6.51	7.07	8.16	9.92	11.66	12.82	13.10	11.86	9.72	7.36	182 17
183	5.70	5.02	5.24	6.42	8.07	10.12	11.98	13.73	14.86	14.72	13.40	11.17	9.22	7.55	6.51	6.57	7.34	8.72	10.61	12.04	12.77	12.64	11.27	9.34	183 17

184	7·48	6·30	5·87	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	184 17
185	9·25	7·90	6·96	6·92	7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	185 17
186	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	186 17
187	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	187 17
188	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	188 17
189	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62	189 17
190	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	7·76	5·44	3·88	3·19	3·88	5·80	190 17
191	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	191 17
192	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	15·05	14·90	13·08	9·91	6·43	3·53	1·84	1·84	192 17
193	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65	2·96	1·56	193 17
194	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46	16·44	15·54	12·76	8·60	5·17	2·76	194 17
195	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	195 17
196	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	196 17
197	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	197 17
198	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	198 17
199	10·92	—	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	199 16
200	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	200 16
201	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	201 16
202	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	202 16
203	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	203 16
204	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	204 16
205	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31	5·74	5·33	205 16
206	6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	13·92	12·56	10·36	8·02	6·14	5·26	206 16
207	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	207 16
208	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	208 16
209	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78	209 16
210	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	210 16
211	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	211 16
212	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	212 16
213	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	213 16
214	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	13·26	13·32	214 16
215	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	215 16
216	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	216 16
217	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	10·20	217 16
218	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46	8·25	218 16
219	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	219 16
220	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	13·21	10·40	7·41	4·97	3·62	3·84	220 16
221	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	15·72	13·66	10·33	6·96	4·40	3·04	221 16
222	3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	16·38	13·96	10·25	6·47	3·74	222 16
Sum	601·59	636·73	714·01	790·22	862·58	919·06	948·75	951·26	927·15	882·49	830·24	782·67	747·86	730·60	727·81	753·44	779·08	795·86	791·62	763·77	715·58	659·03	613·21	590·03	No. of Days.
No.	74	73	74	74	74	74	74	74	74	74	74	74	74	74	73	74	74	74	74	74	74	74	74	74	73d 22h. 18514·64

FORMS FOR SHORT-PERIOD TIDES.

Series R.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
223	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	9·20	5·80	223 16
224	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	224 16
225	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	225 16
226	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	226 16
227	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	227 16
228	12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	228 16
229	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	———	11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	229 15
230	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69	8·30	9·04	10·10	230 15
231	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	231 15
232	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	232 15
233	8·54	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	233 15
234	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	234 15
235	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	235 15
236	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	236 15
237	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	237 15
238	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	238 15
239	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	239 15
240	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	240 15
241	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	241 15
242	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	242 15
243	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	243 15
244	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	244 15
245	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	245 15
246	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	246 15
247	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	247 15
248	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	13·40	12·04	10·04	7·64	5·76	4·78	5·02	248 15
249	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	249 15
250	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29	9·94	6·63	4·34	250 15
251	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	15·76	16·64	15·75	12·94	9·26	6·06	251 15
252	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	252 15
253	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	253 15
254	8·00	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	254 15
255	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92	255 15
256	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	256 15
257	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	257 15

258	13·60	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	258 15
259	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	259 15
260	——	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	260 14
261	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	261 14
262	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	262 14
263	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	263 14
264	6·10	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	264 14
265	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	265 14
266	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	266 14
267	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24	13·97	15·67	15·66	14·20	11·46	267 14
268	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	268 14
269	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	269 14
270	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	270 14
271	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	271 14
272	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	272 14
273	15·06	14·13	12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	273 14
274	14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	274 14
275	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	275 14
276	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	276 14
277	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	277 14
278	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	278 14
279	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	279 14
280	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	280 14
281	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	281 14
282	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	282 14
283	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	283 14
284	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	284 14
285	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	285 14
286	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	286 14
287	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	287 14
288	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	288 14
289	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	289 14
290	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68	——	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	290 13
291	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56	291 13
292	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	292 13
293	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	293 13
294	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	294 13
295	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	295 13
296	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16	296 13
Sum	688·15	651·82	640·93	664·78	718·87	791·73	869·71	931·75	962·30	949·12	893·06	800·04	714·63	622·52	583·60	572·26	606·03	672·81	753·21	824·17	866·86	867·76	832·87	773·14	No. of Days. 73d 21h.
No.	73	74	74	74	74	74	74	74	74	74	74	73	74	73	74	74	74	74	74	74	74	74	74	74	18252·12

FORMS FOR SHORT-PERIOD TIDES.

Series R.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
297	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	297 13
298	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	298 13
299	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	299 13
300	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	300 13
301	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	301 13
302	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	302 13
303	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	303 13
304	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	304 13
305	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	305 13
306	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	306 13
307	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	307 13
308	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	308 13
309	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	309 13
310	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	310 13
311	12·03	9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	311 13
312	13·92	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	312 13
313	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	313 13
314	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	15·72	314 13
315	15·81	14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52	12·80	14·44	315 13
316	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	316 13
317	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	317 13
318	12·86	13·86	13·83	12·96	11·72	10·53	9·66	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	318 13
319	11·74	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	319 13
320	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	—	8·64	320 12
321	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	321 12
322	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	322 12
323	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	323 12
324	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	324 12
325	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	14·20	12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·03	13·27	15·65	16·62	15·90	325 12
326	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	326 12
327	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	15·17	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	327 12
328	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	14·80	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	328 12
329	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	14·67	15·26	14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	329 12
330	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	14·72	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	330 12
331	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	12·68	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	331 12

332	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	332 12
333	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	333 12
334	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	334 12
335	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	335 12
336	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	336 12
337	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	337 12
338	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	338 12
339	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	339 12
340	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	340 12
341	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	341 12
342	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	342 12
343	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88	15·05	343 12
344	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64	5·07	5·86	7·43	9·20	11·48	13·56	344 12
345	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	345 12
346	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	346 12
347	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	10·05	347 12
348	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	348 12
349	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	349 12
350	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	350 12
351	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	——	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	351 11
352	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	352 11
353	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	353 11
354	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	354 11
355	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	15·14	15·03	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	355 11
356	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	356 11
357	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	357 11
358	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	358 11
359	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	359 11
360	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	360 11
361	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14	361 11
362	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28	362 11
363	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	363 11
364	8·24	8·54	9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	364 11
365	9·06	8·58	8·66	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	365 11
366	10·28	9·14	8·62	8·63	9·20	10·44	11·66	12·53	12·92	12·58	11·64	9·77	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	366 11
367	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	367 11
368	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	368 11
369	15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	369 11
370	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	370 2
Sum	927·90	896·08	848·59	799·21	758·63	736·69	735·56	754·53	783·47	812·73	818·07	814·05	770·54	702·29	628·88	561·53	532·20	542·50	589·53	661·82	747·15	827·61	878·34	916·78	No. of Days.
No.	74	74	74	74	74	74	74	74	74	74	73	74	74	74	74	73	73	73	73	73	73	73	72	73	73^d 13^h. 18044·68

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - \frac{3}{2}\eta)$. SERIES T. Motion per mean Solar hour = 14°·9794657.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	1 23
2	16·66	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	2 23
3	16·63	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	3 23
4	14·87	16·40	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	4 23
5	12·28	14·51	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	5 23
6	9·67	12·12	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	6 23
7	7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7 23
8	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	8 23
9	7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	9 23
10	7·14	6·75	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	10 23
11	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84	.13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	11 23
12	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	12 23
13	10·23	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	13 23
14	11·80	9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	14 23
15	13·00	10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	15 23
16	14·09	12·44	9·76	7·00	5·12	4·20 4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	17 0
17	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	18 0
18	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06	19 0
19	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	20 0
20	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	11·40	21 0
21	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	22 0
22	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	23 0
23	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	6·68	24 0
24	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	25 0
25	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	26 0
26	5·38	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	6·83	27 0
27	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	28 0
28	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	29 0
29	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	30 0
30	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	16·84	31 0
31	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	32 0
32	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	33 0
33	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	34 0
34	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07	35 0
35	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	36 0

36	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11	11·12	9·30	7·54	6·26	6·13	6·68	7·86	37	0
37	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	38	0
38	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	39	0
39	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	10·76	9·97	9·00	8·00	7·11	40	0
40	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	41	0
41	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	10·36	8·82	42	0
42	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47	43	0
43	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	12·30	44	0
44	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88	45	0
45	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	14·56	14·85	46	0
46	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90 8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50	15·15	47	1
47	13·08	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	48	1
48	14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	49	1
49	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	14·55	50	1
50	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	10·40	12·80	51	1
51	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06	6·46	8·24	10·33	52	1
52	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	53	1
53	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98	5·77	5·38	5·64	6·37	54	1
54	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	7·32	5·96	5·24	5·12	55	1
55	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	12·26	11·27	9·76	7·96	6·27	5·06	56	1
56	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	12·60	10·86	8·63	6·40	57	1
57	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	13·76	11·70	8·84	58	1
58	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	14·57	11·93	59	1
59	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66	60	1
60	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	61	1
61	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76	62	1
62	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02	63	1
63	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	64	1
64	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	65	1
65	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	66	1
66	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66	67	1
67	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	68	1
68	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	69	1
69	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	70	1
70	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	71	1
71	6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	9·92	8·17	72	1
72	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	73	1
73	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	74	1
74	8·45	6·26	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	75	1
Sum	802·24	763·25	708·83	654·09	616·55	615·05	642·43	706·60	789·02	870·63	931·53	961·39	956·40	914·92	859·06	778·27	714·90	669·06	650·91	663·96	701·29	750·76	792·18	809·21	No. of Days.	
No.	74	74	74	74	74	75	74	74	74	74	74	74	74	74	75	74	74	74	74	74	74	74	74	74	$74^d\ 2^h$. 18322·53	

FORMS FOR SHORT-PERIOD TIDES.

Series T.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
75	10·64	7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	76 1
76	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52 15·06	77 2
77	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	78 2
78	14·26	10·83	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	79 2
79	15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	80 2
80	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	81 2
81	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	82 2
82	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	83 2
83	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	84 2
84	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26	12·36	12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	85 2
85	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	86 2
86	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	6·93	87 2
87	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	14·90	12·22	9·12	88 2
88	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	89 2
89	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	90 2
90	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66	17·13	15·64	91 2
91	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	92 2
92	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	93 2
93	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48	94 2
94	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	95 2
95	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	96 2
96	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	97 2
97	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	98 2
98	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	99 2
99	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84	7·76	100 2
100	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	101 2
101	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	102 2
102	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	103 2
103	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	104 2
104	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	105 2
105	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	106 2
106	11·68	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	107 2
107	14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97 16·50	15·10	12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	108 3
108	13·40	10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	109 3
109	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	110 3

110	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	111	3
111	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	112	3
112	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	113	3
113	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	114	3
114	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62	6·47	115	3
115	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	116	3
116	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	117	3
117	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	118	3
118	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	16·57	15·46	12·94	10·06	119	3
119	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36	16·28	14·70	11·93	120	3
120	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	121	3
121	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	122	3
122	11·86	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76	123	3
123	13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	124	3
124	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	125	3
125	13·92	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	126	3
126	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	127	3
127	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	128	3
128	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	129	3
129	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	130	3
130	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	131	3
131	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	132	3
132	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	133	3
133	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	134	3
134	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	135	3
135	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	136	3
136	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	137	3
137	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78 9·71	12·92	15·50	17·10	17·16	15·40	138	4
138	12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	139	4
139	14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	140	4
140	15·46	14·00	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	141	4
141	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	142	4
142	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	143	4
143	11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	144	4
144	9·76	11·56	13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	145	4
145	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	146	4
146	7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	147	4
147	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14	9·74	8·36	148	4
148	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	149	4
Sum	807·59	758·35	724·77	714·54	731·84	769·22	815·55	855·21	872·02	873·99	809·99	742·41	670·45	610·56	579·07	580·59	614·75	673·79	753·76	814·62	864·55	887·62	882·68	867·30	No. of Days.	
No.	74	74	74	74	74	74	74	74	74	75	74	74	74	74	74	74	74	74	75	74	74	74	74	75	74d 3h. 18275·22	

SERIES T.—(*Continued*).

Day	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	Solar Hour	
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d*	*h*
149	7.84	7.40	7.74	8.92	10.62	12.60	14.02	14.27	13.22	10.78	8.10	5.76	4.27	4.17	5.26	7.20	9.70	12.28	14.66	15.94	16.04	14.86	12.64	10.27	150	4
150	8.44	7.54	7.34	8.10	9.52	11.55	13.36	14.27	13.92	12.06	9.48	6.90	5.12	4.32	4.97	6.54	8.70	11.00	13.46	15.32	16.07	15.67	14.17	11.77	151	4
151	9.56	8.16	7.68	7.83	8.74	10.50	12.26	13.66	14.02	12.96	10.86	8.34	6.24	5.04	4.82	5.84	7.60	9.46	11.87	14.10	15.30	15.60	14.66	12.78	152	4
152	10.74	9.03	7.96	7.73	8.24	9.44	11.07	12.62	13.44	13.16	11.96	9.94	7.67	6.16	5.18	5.56	6.86	8.64	10.66	12.74	14.30	15.12	15.06	13.65	153	4
153	11.84	10.00	8.46	7.75	7.78	8.46	9.92	11.36	12.37	12.84	12.22	10.98	9.18	7.32	6.03	5.94	6.87	8.17	9.67	11.58	13.28	14.64	14.97	14.22	154	4
154	12.62	11.08	9.47	8.38	8.08	8.30	9.20	10.24	11.40	12.12	12.46	11.72	10.38	8.77	7.37	6.70	6.93	7.78	8.83	10.30	11.90	13.54	14.68	14.80	155	4
155	13.77	12.16	10.50	9.20	8.47	8.28	8.60	9.36	10.36	11.26	11.83	12.05	11.56	10.60	9.20	8.14	7.72	7.83	8.62	9.82	11.10	12.64	13.94	14.46	156	4
156	14.16	13.26	11.74	10.42	9.26	8.54	8.34	8.46	9.23	10.10	10.93	11.70	11.97	11.72	11.06	9.98	8.86	8.32	8.36	9.00	10.04	11.54	12.92	13.86	157	4
157	14.25	13.85	12.88	11.48	10.08	8.98	8.20	8.20	8.37	9.12	10.03	11.29	12.14	12.58	12.36	11.84	11.02	10.06	9.23	8.78	9.20	10.37	11.98	13.44	158	4
158	14.22	14.34	13.94	12.86	11.59	10.03	8.74	7.92	7.54	7.76	8.67	9.96	11.54	12.84	13.87	13.86	13.28	12.03	10.56	9.66	9.64	10.17	11.38	12.77	159	4
159	13.98	14.67	15.14	14.88	13.86	12.46	10.48	8.82	7.82	7.50	8.19	9.46	11.28	13.22	14.76	15.82	15.76	14.97	13.34	11.70	10.67	10.27	10.56	11.52	160	4
160	12.90	14.12	15.30	15.65	15.48	14.17	12.02	9.86	8.00	7.09	6.85	7.72	9.34	11.40	13.77	15.84	16.86	16.85	15.70	13.60	11.52	9.95	9.55	9.80	161	4
161	10.84	12.57	14.21	15.47	16.06	15.22	13.50	10.84	8.22	6.16	4.95	5.15	6.50	8.61	11.37	14.18	16.48	17.54	17.17	15.60	12.50	10.07	8.34	8.17	162	4
162	8.96	10.27	12.23	14.24	15.74	16.29	15.33	12.77	9.46	6.32	4.44	3.62	4.30	6.30	8.54	11.95	15.02	17.28	17.95	17.20	15.02	11.76	9.04	7.44	163	4
163	7.22	7.81	9.55	12.08	14.54	16.07	16.21	14.76	11.87	8.16	5.07	3.07	2.74	3.80	5.94	9.24	12.80	15.92	18.07	18.53	17.65	14.65	10.90	8.00	164	4
164	6.62	6.55	7.50	9.65	12.45	14.89	16.40	16.14	14.28	10.90	7.10	4.31	2.62	2.37	3.68	6.30	9.76	13.48	16.44	18.12	18.40	17.00	13.80	10.17	165	4
165	7.55	6.20	6.18	7.30	9.60	12.79	15.16	16.42	15.96	13.80	10.33	6.77	4.00	2.33	2.54	4.18	7.11	10.40	13.95	16.74	17.85	17.95	16.07	12.81	166	4
166	9.60	7.05	5.72	5.77	7.00	9.56	12.80	15.12	16.05	15.26	12.76	9.20	6.14	3.95	2.88	3.47	5.52	7.93	11.04	14.21	16.44	17.72	17.40	15.44	167	4
167	12.07	9.02	6.70	5.67	5.93	7.41	10.07	13.02	14.92	15.57	14.68	12.28	9.20	6.52	4.77	4.20	4.94	6.52	8.80	11.67	14.34	16.42	17.20	16.60	168	4
168	14.54	11.30	8.66	6.74 6.05	6.16	7.65	10.05	12.50	14.32	14.85	14.05	11.96	9.47	7.26	6.06	5.80	6.39	7.66	9.64	11.92	14.25	15.90	16.46	15.74	169	5
169	13.76	10.84	8.61	6.86	6.32	6.58	7.80	9.82	12.04	13.55	14.17	13.54	12.03	10.34	8.60	7.57	7.26	7.62	8.44	9.92	12.12	14.20	15.46	15.54	170	5
170	14.58	12.66	10.40	8.31	7.04	6.60	6.77	7.78	9.32	11.22	12.80	13.58	13.46	12.40	10.90	9.62	8.66	8.31	8.49	9.03	10.30	12.04	13.70	14.74	171	5
171	14.75	13.73	12.02	10.10	8.46	7.12	6.53	6.70	7.50	9.03	10.90	12.32	13.20	13.38	12.92	11.94	10.67	9.60	8.94	8.82	9.24	10.33	11.90	13.24	172	5
172	14.06	14.10	13.34	11.84	10.05	8.26	6.94	6.44	6.67	7.49	9.06	10.86	12.50	13.66	14.10	13.63	12.46	11.06	10.06	9.30	9.05	9.33	10.22	11.60	173	5
173	12.90	13.82	13.85	13.08	11.64	9.76	8.00	6.70	6.08	6.22	7.28	9.00	10.94	12.77	14.05	14.63	14.17	12.86	11.33	10.04	9.14	8.86	9.20	10.08	174	5
174	11.26	12.44	13.30	13.52	12.80	11.00	8.85	7.06	5.67	5.05	5.60	7.15	9.26	11.30	13.28	14.45	14.84	13.95	12.40	10.90	9.46	8.62	8.24	8.56	175	5
175	9.64	11.12	12.55	13.40	13.37	12.07	10.07	8.20	6.17	4.94	4.74	5.62	7.74	9.76	12.14	14.01	15.00	14.86	13.77	12.06	10.27	8.84	8.10	7.94	176	5
176	8.52	9.68	11.18	12.64	13.37	13.05	11.52	9.17	6.76	5.11	4.16	4.64	6.10	8.00	10.50	12.90	14.56	15.33	14.70	13.32	11.14	9.44	8.17	7.54	177	5
177	7.57	8.34	9.81	11.65	13.20	13.60	12.56	10.40	7.97	5.83	4.38	4.04	4.96	6.82	9.02	11.57	13.86	15.24	15.44	14.56	12.56	10.36	8.63	7.62	178	5
178	7.30	7.74	8.86	10.67	12.47	13.67	13.60	12.02	9.66	6.93	4.96	3.94	4.22	5.70	7.84	10.40	12.82	14.74	15.56	15.33	13.80	11.44	9.35	7.79	179	5
179	7.04	7.03	7.90	9.44	11.66	13.22	13.92	13.00	10.74	8.00	5.64	4.04	3.83	4.76	6.70	9.02	11.37	13.67	15.12	15.46	14.48	12.44	9.96	8.16	180	5
180	6.86	6.42	6.94	8.42	10.44	12.57	13.67	13.68	12.22	9.64	6.86	4.96	3.98	4.36	5.65	7.72	10.02	12.26	14.31	15.28	15.12	13.77	11.30	9.01	181	5
181	7.37	6.64	6.56	7.46	9.06	11.01	12.70	13.51	13.01	11.07	8.44	6.12	4.72	4.42	5.32	6.94	8.97	11.17	13.22	14.74	15.17	14.22	12.16	9.74	182	5
182	7.86	6.74	6.51	7.07	8.16	9.92	11.66	12.82	13.10	11.86	9.72	7.36	5.70	5.02	5.24	6.42	8.07	10.12	11.98	13.73	14.86	14.72	13.40	11.17	183	5
183	9.22	7.55	6.51	6.57	7.34	8.72	10.61	12.04	12.77	12.64	11.27	9.34	7.48	6.30	5.87	6.54	7.66	9.24	10.97	12.94	14.38	14.88	14.20	12.50	184	5

184	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38	185	5
185	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98	13·72	186	5
186	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	187	5
187	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	188	5
188	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	189	5
189	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	190	5
190	11·70	13·12	13·97	13·69	12·32	10·27	7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	191	5
191	9·54	11·60	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	192	5
192	7·17	9·30	11·84	13·92	15·05	14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	193	5
193	5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	194	5
194	4·66	4·98	6·66	9·72	13·12	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	195	5
195	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	196	5
196	7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	197	5
197	9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	198	5
198	11·28	8·50	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92 9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	199	6
199	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	13·40	200	6
200	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	201	6
201	12·71	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78	202	6
202	13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70	203	6
203	12·60	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	9·48	10·50	204	6
204	11·72	12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	205	6
205	10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	206	6
206	9·62	10·95	12·64	13·76	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	207	6
207	8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	7·18	208	6
208	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	209	6
209	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	210	6
210	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	211	6
211	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	212	6
212	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	213	6
213	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	214	6
214	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	215	6
215	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	216	6
216	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	217	6
217	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	218	6
218	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	219	6
219	13·70	14·26	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	220	6
220	12·56	14·24	15·18	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	221	6
221	10·22	12·92	15·15	16·26	15·72	13·66	10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	222	6
222	7·72	10·60	13·60	16·07	17·04	16·38	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	223	6
Sum	761·15	735·39	730·29	748·21	761·45	777·21	778·66	762·11	727·00	681·79	643·16	622·47	636·07	656·72	710·32	778·72	844·03	893·18	922·45	929·21	914·02	883·88	841·93	796·72	No. of Days. $74^d\ 2^h$.	
No.	74	74	74	75	74	74	74	74	74	74	74	74	75	74	74	74	74	74	74	74	74	74	74	74	18536·14	

FORMS FOR SHORT-PERIOD TIDES.

Series T.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour d	h
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d	h
223	5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	224	6
224	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	225	6
225	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	226	6
226	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	227	6
227	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	228	6
228	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38 / 11·88	10·06	229	7
229	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	230	7
230	9·96	8·64	7·77	7·46	7·69	8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	231	7
231	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	232	7
232	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	233	7
233	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	234	7
234	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	235	7
235	11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	236	7
236	10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	237	7
237	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	238	7
238	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	239	7
239	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06	5·50	5·18	240	7
240	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	241	7
241	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	242	7
242	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·50	243	7
243	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	10·02	8·06	244	7
244	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	9·86	245	7
245	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	11·74	246	7
246	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	247	7
247	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	248	7
248	13·74	13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	249	7
249	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	9·64	250	7
250	12·52	14·74	15·98	15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	251	7
251	10·06	13·28	15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	252	7
252	7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	253	7
253	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	254	7
254	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	255	7
255	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	256	7
256	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	257	7
257	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	258	7

258	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	259	7
259	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90 11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	260	8
260	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	261	8
261	10·46	9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	262	8
262	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38	263	8
263	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	264	8
264	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	265	8
265	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	266	8
266	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	267	8
267	11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	268	8
268	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	269	8
269	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	270	8
270	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	271	8
271	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	272	8
272	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	273	8
273	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	274	8
274	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92	275	8
275	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	276	8
276	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	277	8
277	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	278	8
278	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	279	8
279	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	280	8
280	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	281	8
281	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	282	8
282	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	283	8
283	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	284	8
284	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	285	8
285	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	286	8
286	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36	287	8
287	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	7·66	288	8
288	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	289	8
289	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68 8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	290	9
290	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	291	9
291	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	292	9
292	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	293	9
293	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	294	9
294	15·00	14·16	12·26	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	295	9
295	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	296	9
296	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	297	9
Sum	684·65	730·53	775·97	806·80	819·31	808·65	778·61	753·03	708·68	690·76	701·45	733·96	780·80	830·13	870·70	888·13	889·11	848·73	799·61	741·31	687·48	653·13	653·86	656·28	No. of Days. $74^d\ 3^h$. 18291·67	
No.	74	74	74	74	74	74	74	75	74	74	74	74	74	74	74	74	75	74	74	74	74	74	75	74		

FORMS FOR SHORT-PERIOD TIDES.

SERIES T.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour d	h
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d	h
297	14.60	16.81	17.35	16.28	13.64	10.44	7.71	6.07	5.84	6.88	8.87	11.47	14.12	15.94	16.22	14.81	11.87	8.55	5.46	3.46	2.87	4.17	6.35	9.32	298	9
298	13.00	15.95	17.47	17.44	15.72	12.68	9.66	7.28	5.94	6.04	7.36	9.64	12.45	14.84	16.04	15.60	13.70	10.52	7.15	4.66	2.92	3.10	4.72	7.47	299	9
299	10.55	13.92	16.35	17.36	16.74	14.57	11.67	8.85	6.76	5.94	6.28	7.70	9.92	12.68	14.78	15.58	14.78	12.36	9.26	6.36	4.20	3.07	3.72	5.55	300	9
300	8.04	11.05	14.10	16.17	16.96	16.12	14.06	11.35	8.82	7.14	6.57	7.02	8.46	10.56	13.14	14.64	15.04	13.76	11.47	8.74	6.42	4.70	4.22	5.00	301	9
301	6.80	9.02	11.88	14.60	16.14	16.22	15.16	13.26	10.86	8.86	7.58	7.14	7.44	8.84	10.92	12.84	13.84	13.86	12.57	10.68	8.54	6.84	5.56	5.27	302	9
302	5.98	7.33	9.36	11.72	14.00	15.22	15.38	14.58	12.88	11.01	9.42	8.12	7.64	7.92	8.94	10.40	11.85	12.91	13.12	12.26	10.75	9.22	7.66	6.68	303	9
303	6.30	6.72	7.86	9.44	11.50	13.34	14.46	14.66	13.96	12.74	11.30	9.76	8.54	7.93	7.84	8.40	9.60	10.88	12.06	12.64	12.40	11.47	10.10	8.76	304	9
304	7.68	7.01	7.06	7.90	9.22	10.97	12.56	13.72	14.38	14.04	13.04	11.45	9.76	8.15	7.22	7.02	7.48	8.84	10.32	11.48	12.55	12.87	12.46	11.36	305	9
305	9.70	8.28	7.14	6.80	7.40	8.84	10.74	12.56	13.87	14.54	14.38	13.40	11.67	9.60	7.53	6.30	5.88	6.50	8.20	10.07	11.93	13.36	14.04	13.66	306	9
306	12.30	10.26	8.61	7.37	6.86	7.24	8.35	10.36	12.50	14.13	15.08	14.96	13.80	11.64	9.03	6.96	5.44	5.04	5.86	7.79	10.12	12.66	14.54	15.37	307	9
307	14.86	13.04	10.66	8.56	7.12	6.44	6.77	8.02	10.14	12.62	14.56	15.55	15.25	13.56	10.92	8.12	5.82	4.22	4.10	5.32	7.70	10.85	13.60	15.51	308	9
308	16.05	15.06	12.86	10.40	8.16	6.53	5.96	6.51	8.24	10.85	13.27	15.16	15.84	15.03	12.98	9.78	7.04	4.71	3.46	3.86	5.60	8.44	11.74	14.64	309	9
309	16.50	16.72	15.38	12.86	9.98	7.70	6.25	5.93	6.71	8.67	11.25	13.84	15.52	15.84	14.55	11.68	8.46	5.64	3.63	3.01	4.08	6.50	9.62	13.08	310	9
310	15.81	17.12	16.72	14.87	12.03	9.20	7.26	6.32	6.37	7.46	9.60	12.20	14.35	15.67	15.28	13.15	10.15	7.00	4.47	3.03	3.22	5.03	7.60	10.76	311	9
311	14.05	16.38	17.05	16.14	13.92	11.10	8.66	6.87	6.16	6.46	8.00	10.44	13.10	14.76	15.16	13.92	11.40	8.36	5.66	3.69	2.94	3.94	6.18	9.01	312	9
312	12.24	14.92	16.53	16.56	15.16	12.66	10.06	7.96	6.74	6.60	7.35	9.00	11.24	13.43	14.50	14.36	12.66	9.94	7.20	4.97	3.56	3.77	5.34	7.72	313	9
313	10.56	13.46	15.64	16.34	15.71	13.92	11.46	9.28	7.66	6.86	6.98	7.98	9.96	12.00	13.52	14.02	13.37	11.18	8.81	6.52	4.86	4.33	5.20	6.90	314	9
314	9.14	11.80	14.20	15.72	15.81	14.66	12.72	10.71	8.96	7.82	7.56	7.92	9.16	10.68	12.24	13.26	13.26	12.06	10.17	8.00	6.25	5.31	5.50	6.66	315	9
315	8.34	10.52	12.80	14.44	15.18	14.68	13.32	11.56	10.02	8.76	8.10	8.00	8.60	9.65	10.96	12.18	12.58	12.23	11.04	9.16	7.62	6.54	6.20	6.84	316	9
316	7.96	9.38	11.14	12.91	14.18	14.40	13.64	12.37	10.90	9.58	8.78	8.46	8.68	9.30	10.00	10.94	11.57	11.80	11.36	10.28	8.94	7.84	7.18	7.20	317	9
317	7.86	8.80	9.98	11.46	12.86	13.86	13.83	12.96	11.72	10.53	9.66	9.14	8.92	8.96	9.17	9.66	10.40	11.10	11.37	11.01	10.20	9.26	8.46	8.10	318	9
318	8.14	8.66	9.44	10.56	11.74	12.76	13.34	13.26	12.61	11.72	10.86	9.76	9.04	8.80	8.85	9.16	9.64	10.14	10.74	11.18	11.32	11.06	10.38	9.58	319	9
319	8.94	8.71	8.90	9.50	10.42	11.46	12.48	13.10	13.15	12.64	11.84	10.76	9.71	8.88	8.35	8.19	8.42	9.04	9.96	10.86	11.50	11.80	11.55	10.96	320	9
320	9.98	9.08 8.64	8.75	9.38	10.38	11.46	12.41	13.07	13.16	12.84	11.84	10.56	9.24	8.13	7.50	7.43	7.86	8.83	10.03	11.16	12.23	12.80	12.64	11.66	321	10
321	10.25	9.04	8.36	8.34	8.96	10.02	11.20	12.46	13.23	13.47	13.00	11.72	10.14	8.38	7.03	6.27	6.31	7.08	8.52	10.23	11.92	13.17	13.63	13.10	322	10
322	11.86	10.18	8.76	7.98	7.96	8.75	10.13	11.64	13.14	13.94	13.94	13.04	11.34	9.30	7.45	5.86	5.13	5.46	6.76	8.80	11.15	13.20	14.66	14.98	323	10
323	13.87	11.76	9.58	8.10	7.27	7.36	8.22	9.83	11.76	13.33	14.28	14.14	12.87	10.56	7.98	5.77	4.14	3.74	4.67	6.71	9.27	12.02	14.40	15.66	324	10
324	15.44	13.71	11.16	8.74	7.02	6.40	6.78	8.22	10.37	12.25	13.88	14.74	14.20	12.26	9.36	6.51	4.12	2.75	2.94	4.56	7.03	10.05	13.27	15.65	325	10
325	16.62	15.90	13.76	10.86	8.17	6.45	5.84	6.36	8.12	10.44	12.84	14.46	15.08	13.97	11.41	8.07	4.96	2.57	1.63	2.58	4.74	7.64	11.12	14.22	326	10
326	16.47	17.07	15.75	12.96	9.86	7.26	5.65	5.46	6.44	8.40	11.20	13.57	15.11	15.17	13.27	9.96	6.40	3.62	1.76	1.54	3.26	6.02	9.25	12.97	327	10
327	15.66	17.40	17.25	15.37	12.23	9.00	6.75	5.63	5.63	6.88	9.32	12.22	14.44	15.50	14.80	12.31	8.84	5.46	3.00	1.66	2.20	4.15	6.95	10.46	328	10
328	13.81	16.44	17.54	16.82	14.56	11.38	8.50	6.32	5.44	5.74	7.26	10.06	12.76	14.67	15.26	14.06	11.32	8.05	5.16	2.94	2.16	3.11	5.16	7.96	329	10
329	11.23	14.30	16.57	17.22	16.23	13.81	10.68	8.07	6.16	5.50	5.88	7.64	10.25	12.77	14.29	14.72	13.33	10.74	7.81	5.32	3.66	3.26	4.42	6.34	330	10
330	8.86	11.67	14.58	16.33	16.57	15.28	12.84	9.93	7.47	6.23	5.72	6.26	7.94	10.30	12.38	13.76	13.96	12.68	10.56	8.18	6.28	4.97	4.83	5.73	331	10
331	7.34	9.38	12.05	14.37	15.76	15.80	14.56	12.28	9.94	8.13	6.64	6.14	6.54	8.04	10.04	11.78	12.86	13.16	12.24	10.73	8.96	7.30	6.24	5.96	332	10

332	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	333 10
333	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	334 10
334	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	335 10
335	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	336 10
336	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	337 10
337	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	338 10
338	16·34	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	339 10
339	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	340 10
340	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	341 10
341	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	342 10
342	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	343 10
343	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64	5·07	5·86	7·43	9·20	344 10
344	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	345 10
345	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	346 10
346	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	347 10
347	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	348 10
348	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	349 10
349	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	350 10
350	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78 8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	351 11
351	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	352 11
352	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	353 11
353	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	354 11
354	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	15·14	15·03	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	355 11
355	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	356 11
356	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	357 11
357	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	358 11
358	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	359 11
359	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	360 11
360	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14	361 11
361	8·74	10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28	362 11
362	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	363 11
363	8·24	8·54	9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	364 11
364	9·06	8·58	8·66	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	365 11
365	10·28	9·14	8·62	8·63	9·20	10·44	11·66	12·53	12·92	12·58	11·64	9·77	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	366 11
366	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	367 11
367	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	368 11
368	15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	369 11
369	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	370 2
Sum	858·63	897·93	898·18	885·36	852·88	808·82	767·26	739·54	727·51	736·31	757·27	786·73	788·51	779·34	747·95	690·64	636·79	591·00	565·80	566·93	600·26	659·01	727·31	792·98	No. of Days.
No.	73	74	73	73	73	73	73	73	73	73	73	74	73	73	73	72	72	72	72	72	72	72	72	72	$72^d\ 17^h$. 17862·94

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - \frac{1}{2}\sigma - \frac{1}{2}\eta)$. SERIES MS. Motion per mean Solar hour = 14°·7460261.

Day	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	1 23
2	16·66	15·40	12·16	8·40	4·86	2·56 1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	16·63	3 0
3	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	14·87	4 0
4	16·40	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80 12·16	8·68	6·10	5·05	5·25	6·68	9·24	12·28	14·51	5 1
5	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67	12·12	6 1
6	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76	7 1
7	11·80	13·27 14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	8 2
8	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	7·34	8·07	9 2
9	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17 11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	10 3
10	8·96	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	11 3
11	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34 6·16	5·74	6·34	12 4
12	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62	5·56	13 4
13	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66	7·32	5·82	5·14	14 4
14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24 13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	10·84	8·24	6·20	4·76	4·46	15 5
15	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	16 5
16	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06 14·68	13·84	11·50	8·60	5·94	4·37	4·02	17 6
17	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48	5·34	4·30	18 6
18	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	19 6
19	4·24	5·16	7·15	9·68 12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	20 7
20	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	21 7
21	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11 7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	22 8
22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	23 8
23	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	24 8
24	9·94 9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	25 9
25	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	26 9
26	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33 12·40	10·74	8·86	6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	27 10
27	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	28 10
28	16·12	14·36	11·40	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88 11·48	14·56	17·04	17·86	29 11
29	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	30 11
30	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	31 11
31	18·64	18·38	16·30	12·42	8·97	6·01	4·46 4·57	6·12	9·14	12·56	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	32 12
32	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	33 12
33	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66 6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	34 13
34	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	35 13
35	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	36 13

36	13·76	14·66	14·44 13·11	11·12	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	37 14
37	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	9·94	10·44	38 14
38	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07 10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	39 15
39	10·80	11·27	11·45	11·25	10·76	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	40 15
40	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16 8·67	8·64	41 16
41	9·01	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	42 16
42	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	43 16
43	7·53	8·16	9·56	11·03	12·66	13·62	13·60	12·30	10·24 7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	44 17
44	7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	45 17
45	5·96	6·74	8·48	10·85	13·07	14·56	14·85	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64 16·01	13·87	10·90	8·00	6·17	5·46	46 18
46	5·74	7·26	9·70	12·25	14·42	15·50	15·15	13·08	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	47 18
47	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	48 18
48	4·23	4·46	6·07	8·56	11·57 14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	49 19
49	4·14	5·07	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	50 19
50	4·54	4·69	5·80	7·87	10·40	12·80	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86 9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	51 20
51	4·58	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	52 20
52	5·45	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	53 20
53	6·98 5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	54 21
54	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	12·26	11·27	55 21
55	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14 14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	12·60	56 22
56	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	57 22
57	13·76	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52 11·16	13·67	15·38	15·86	58 23
58	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	59 23
59	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	60 23
60	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90 5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	62 0
61	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	63 0
62	16·02	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28 4·57	4·06	4·86	6·67	9·40	12·24	14·39	64 1
63	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	65 1
64	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	66 1
65	12·44	13·56	13·74	12·74 11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66	10·96	67 2
66	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	9·78	68 2
67	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26 11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	69 3
68	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	70 3
69	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	6·74	6·70 7·63	71 4
70	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	9·92	8·17	6·67	5·98	6·16	72 4
71	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	7·27	5·74	5·30	73 4
72	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44 7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	74 5
Sum	780·48	791·55	784·03	776·19	756·55	739·51	739·98	754·28	739·34	740·07	775·30	781·18	798·51	806·78	798·63	775·47	745·83	740·42	725·86	696·82	707·13	696·37	715·24	738·79	No. of Days. 73d 6h.
No.	74	73	73	74	73	73	73	74	73	73	74	73	73	73	74	73	73	74	73	72	74	73	73	73	18104·31

FORMS FOR SHORT-PERIOD TIDES.

Series MS.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h.	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
73	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44	4·44	75 5
74	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20 12·86	9·54	6·67	4·92	4·38	76 6
75	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	6·13	4·66	77 6
76	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	78 6
77	5·11	5·88	7·84	10·46	13·38	15·68 16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12	79 7
78	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	80 7
79	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26 9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	81 8
80	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	82 8
81	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	83 8
82	11·70	10·34 9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·41	13·62	84 9
83	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26	12·36	12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	85 9
84	14·16	13·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06 13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	86 10
85	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	87 10
86	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14 14·15	16·35	17·15	88 11
87	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	89 11
88	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	90 11
89	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41 6·43	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	91 12
90	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	92 12
91	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36 7·32	7·28	8·03	9·50	11·53	13·48	14·74	93 13
92	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	94 13
93	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	95 13
94	12·80	12·96	12·28	10·94 9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	96 14
95	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	97 14
96	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96 12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	98 15
97	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	99 15
98	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82 8·36	100 16
99	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	101 16
100	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	102 16
101	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66 6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	103 17
102	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	104 17
103	3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·53	8·91	11·80	14·40	15·97	16·08	14·35	11·30 7·80	4·97	2·93	2·46	105 18
104	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	106 18
105	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24	3·17	107 18
106	2·56	3·47	5·74	8·64	12·02	15·12	16·94 17·54	16·24	13·40	10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	108 19
107	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	7·24	5·36	109 19

108	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54 11·58	13·16	13·74	13·28	11·76	9·56	7·60	5·96	110 20
109	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	8·48	111 20
110	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	112 20
111	9·47	8·14	7·03 6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85	9·40	10·96	12·36	13·06	13·12	12·22	113 21
112	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	13·72	13·87	114 21
113	12·97	11·36	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54 12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	115 22
114	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	116 22
115	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94 15·14	16·26	117 23
116	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	118 23
117	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	119 23
118	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74 9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	121 0
119	16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	122 0
120	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36 4·90	6·32	8·22	10·36	12·80	14·56	123 1
121	15·43	14·76	13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	124 1
122	14·60	14·86	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	125 1
123	13·38	14·08	13·92	12·90	11·41 10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	126 2
124	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	127 2
125	12·22	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26 11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	128 3
126	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	129 3
127	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	130 3
128	9·37 10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	131 4
129	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	132 4
130	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18 3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	133 5
131	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	134 5
132	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58 10·90	8·02	5·94	5·46	135 6
133	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	136 6
134	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	137 6
135	5·76	5·60	6·58	8·80	11·97	14·34	15·47 15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	138 7
136	6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	139 7
137	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	8·08 10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	140 8
138	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	141 8
139	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	142 8
140	11·14	9·14	7·48	6·36 5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	143 9
141	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96	144 9
142	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24 11·36	9·64	8·16	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	145 10
143	12·62	10·50	7·84	5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	14·36	146 10
144	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28 14·53	147 11
145	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	148 11
Sum	764·71	758·18	744·83	750·08	753·14	774·85	803·07	771·79	759·95	735·54	733·69	736·75	736·99	744·06	727·51	727·84	759·37	771·30	790·55	809·98	806·69	784·09	782·49	789·12	No. of Days.
No.	74	74	74	75	74	74	75	74	74	73	75	74	74	75	74	74	75	74	74	74	75	74	74	75	74^d 6^h. 18316·57

FORMS FOR SHORT-PERIOD TIDES.

SERIES MS.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
146	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	14·02	149 11
147	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70 12·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	11·55	13·36	14·27	150 12
148	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00	13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66	151 12
149	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73 8·24	9·44	11·07	12·62	13·44	152 13
150	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	153 13
151	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24	11·40	154 13
152	12·12	12·46	11·72	10·38	8·77	7·37 6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	155 14
153	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	156 14
154	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85 12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	157 15
155	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67	158 15
156	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19	159 15
157	9·46	11·28 13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	12·02	9·86	8·00	7·09	6·85	7·72	160 16
158	9·34	11·40	13·77	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16	4·95	5·15	161 16
159	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17 8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	9·46	6·32	4·44	3·62	4·30	162 17
160	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	11·87	8·16	5·07	3·07	2·74	163 17
161	3·80	5·94	9·24	12·80	15·92	18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14	14·28	10·90	7·10 4·31	2·62	2·37	164 18
162	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96	13·80	10·33	6·77	4·00	2·33	165 18
163	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	16·05	15·26	12·76	9·20	6·14	3·95	166 18
164	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72 17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07	13·02	14·92	15·57	14·68	12·28	9·20	6·52	4·77	167 19
165	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85	14·05	11·96	9·47	7·26	168 19
166	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86	6·32	6·58	7·80	9·82 12·04	13·55	14·17	13·54	12·03	10·34	8·60	169 20
167	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	170 20
168	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	171 20
169	11·94	10·67	9·60	8·94 8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	172 21
170	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	173 21
171	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00 8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	174 22
172	13·95	12·40	10·90	9·46	8·62	8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	175 22
173	14·86	13·77	12·06	10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56 15·33	176 23
174	14·70	13·32	11·14	9·44	8·17	•7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	177 23
175	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	7·84	10·40	12·82	14·74	178 23
176	15·56	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44 11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12	180 0
177	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31	181 0
178	15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94 8·97	11·17	13·22	14·74	182 1
179	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07	10·12	11·98	13·73	183 1
180	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	9·24	10·97	12·94	184 1

181	14·38	14·88	14·20	12·50	10·34	8·44	7·22 6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56	8·50	10·00	11·48	13·23	185 2
182	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	186 2
183	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46 10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	187 3
184	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	188 3
185	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	189 3
186	10·28	11·72	13·02 13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	190 4
187	10·00	11·70	13·12	13·97	13·69	12·32	10·27	7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	191 4
188	7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49 5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	192 5
189	7·17	9·30	11·84	13·92	15·05	14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	193 5
190	5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47 5·86	4·66	194 6
191	4·98	6·66	9·72	13·12	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	195 6
192	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	196 6
193	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53 11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26	6·86	197 7
194	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	198 7
195	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10 14·71	15·40	14·72	12·96	10·60	8·38	199 8
196	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	200 8
197	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	201 8
198	9·77	8·47	7·34	6·76	6·86 7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50	11·42	202 9
199	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94	12·66	203 9
200	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08 10·74	9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	204 10
201	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	205 10
202	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	206 10
203	13·92 12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	207 11
204	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	208 11
205	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14 15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	209 12
206	14·32	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	210 12
207	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34 9·23	11·44	13·54	14·58	211 13
208	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	212 13
209	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	213 13
210	13·67	13·96	12·84	10·98	9·00	7·60	6·88 7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	214 14
211	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	215 14
212	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29 9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	216 15
213	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	217 15
214	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46	218 15
215	8·25	10·24	12·44 14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	219 16
216	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	13·21	10·40	7·41	4·97	3·62	3·84	220 16
217	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10 10·22	12·92	15·15	16·26	15·72	13·66	10·33	6·96	4·40	3·04	3·33	221 17
218	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	16·38	13·96	10·25	6·47	3·74	2·56	222 17
Sum	789·28	790·73	799·61	767·73	755·98	752·44	760·73	767·67	757·55	770·07	783·94	803·37	818·22	838·19	819·00	799·31	788·61	763·24	756·48	739·28	735·82	722·48	732·46	761·19	No. of Days.
No.	74	74	75	74	74	74	75	74	74	75	74	74	74	75	74	74	75	74	74	74	75	74	74	74	$74^d\ 6^h$. 18573·38

FORMS FOR SHORT-PERIOD TIDES.

SERIES MS.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
219	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	9·20	5·80	3·36 / 2·56	223 18
220	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	224 18
221	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62	225 18
222	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32 / 10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	6·32	226 19
223	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48	10·40	8·65	227 19
224	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26 / 13·57	12·85	11·76	10·70	9·74	228 20
225	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	229 20
226	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69	8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	230 20
227	11·72	11·15	10·62	10·30	10·00	10·14 / 10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57	12·72	13·42	13·56	13·18	231 21
228	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	232 21
229	13·26	12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36 / 6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	233 22
230	13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	234 22
231	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	235 22
232	15·46	14·62 / 12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	236 23
233	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	237 23
234	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83	13·20	15·21 / 15·71	14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	239 0
235	16·16	14·21	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	240 0
236	16·56	15·34	12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62 / 13·17	15·30	16·38	241 1
237	15·97	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	242 1
238	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	243 1
239	15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38 / 6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	244 2
240	14·44	13·86	12·25	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	245 2
241	13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92 / 10·73	9·67	9·16	9·18	9·63	10·54	11·48	246 3
242	12·46	12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	247 3
243	10·86	12·02	12·34	12·98	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	248 3
244	9·04	10·38	12·00	13·14 / 13·74	13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	249 4
245	8·06	9·98	12·06	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15	250 4
246	5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38 / 8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	251 5
247	4·58	6·80	10·06	13·28	15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	252 5
248	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52 / 3·00	253 6
249	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	254 6
250	2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	255 6
251	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66 / 9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	256 7
252	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	257 7
253	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76 / 12·71	11·64	9·87	8·26	7·04	258 8

254	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	259 8
255	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	260 8
256	9·06	8·35	7·72	7·46	7·67	8·44 9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	261 9
257	9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	262 9
258	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06 7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	263 10
259	11·17	9·62	7·86	6·55	6·10	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	264 10
260	12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	265 10
261	14·04	12·68	10·30 7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	266 11
262	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24	13·97	15·67	267 11
263	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07 14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	268 12
264	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	269 12
265	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27 14·84	16·21	270 13
266	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	271 13
267	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	272 13
268	14·81	15·06	14·13	12·37	10·44	8·86	7·87	7·56	7·92 8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	273 14
269	14·16	14·44	13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	274 14
270	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92	8·44 7·14	6·37	6·38	7·34	8·76	10·57	275 15
271	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	276 15
272	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	277 15
273	7·68	9·72	11·97	13·90	15·26 15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	278 16
274	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	279 16
275	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85 11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	280 17
276	5·96	7·74	10·58	13·66	16·26	17·40	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	281 17
277	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	282 17
278	5·44 6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	283 18
279	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	284 18
280	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88 5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	285 19
281	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	286 19
282	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28 12·32	11·06	10·10	9·27	287 20
283	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04	10·37	288 20
284	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	289 20
285	10·82	9·97	9·24	8·77	8·68	8·96	9·55 10·22	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	290 21
286	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	291 21
287	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28 7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	292 22
288	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	293 22
289	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	294 22
290	14·56	12·60	9·98 7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	295 23
291	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	296 23
Sum	759·72	757·68	747·32	738·03	754·25	781·97	793·89	796·22	787·52	782·28	749·69	748·59	735·87	713·44	705·92	705·90	736·03	763·99	790·44	825·82	806·03	794·53	793·70	781·00	No. of Days. 74d 6h.
No.	74	74	75	74	74	75	74	74	74	75	74	74	74	74	74	74	75	74	74	75	74	74	74	75	18349·83

FORMS FOR SHORT-PERIOD TIDES.

SERIES MS.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour	
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d	h
292	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35 16·28	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	298	0
293	14·81	11·87	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	299	0
294	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68 14·78	15·58	300	1
295	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64	301	1
296	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	10·92	12·84	302	1
297	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33 9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	7·92	8·94	10·40	11·85	303	2
298	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	304	2
299	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76 8·15	7·22	7·02	7·48	8·84	305	3
300	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	306	3
301	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	307	3
302	5·86	7·79	10·12	12·66	14·54	15·37 14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10	308	4
303	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46	309	4
304	3·86	5·60	8·44	11·74	14·64	16·50	16·73	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25 13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	310	5
305	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	311	5
306	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	312	5
307	2·94	3·94 6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	313	6
308	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	314	6
309	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96 7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	315	7
310	5·50	6·66	8·34	10·52	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	316	7
311	6·20	6·84	7·96	9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28 8·94	7·84	7·18	317	8
312	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72	10·53	9·66	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	318	8
313	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	319	8
314	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48 13·10	13·15	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·90	320	9
315	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	321	9
316	11·66	10·25	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	13·00	11·72	10·14	8·38	7·03	6·27	6·31 7·08	8·52	10·23	11·92	13·17	13·63	13·10	322	10
317	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	323	10
318	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	324	10
319	15·44	13·71	11·16	8·74 7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	14·20	12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	325	11
320	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	326	11
321	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	15·17	13·27 9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	327	12
322	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	14·80	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	328	12
323	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	14·67	15·26	14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30 16·57	329	13
324	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	14·72	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	330	13
325	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	12·68	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	12·05	331	13
326	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54 8·04	10·04	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	332	14

327	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	333 14
328	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75 8·54	7·84	7·88	8·64	10·02	334 15
329	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	335 15
330	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97	7·94	7·68	336 15
331	8·24	9·50	11·14	12·75	13·98	14·44 13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	337 16
332	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38	7·53	338 16
333	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61 13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	339 17
334	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	340 17
335	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	8·26	341 17
336	7·37	7·26	8·12 9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	342 18
337	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	343 18
338	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64	5·07 5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	344 19
339	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	345 19
340	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31 9·72	8·40	346 20
341	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	347 20
342	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	348 20
343	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54 11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	349 21
344	8·86	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	350 21
345	9·78	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18 11·57	12·76	13·30	13·22	12·46	11·00	351 22
346	9·17	7·18	5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	352 22
347	10·80	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	353 22
348	13·00	10·50	7·72	5·17	3·42 2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	15·14	15·03	354 23
349	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	355 23
350	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47 12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	357 0
351	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	358 0
352	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70	359 0
353	15·36 15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	10·96	13·30	360 1
354	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	8·60	10·76	361 1
355	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14	8·74 10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	6·00	7·78	9·85	362 2
356	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70	6·37	7·72	363 2
357	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	8·24	8·54	9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74 5·77	5·52	6·12	7·27	364 3
358	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	8·58	8·66	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	6·86	5·72	5·37	5·87	365 3
359	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	10·28	9·14	8·62	8·63	9·20	10·44	11·66	12·53	12·92	12·58	11·64	9·77	7·86	6·12	5·05	4·78	366 3
360	5·62	7·06	9·15	11·26	13·23	14·30	14·32 13·36	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	9·64	7·34	5·52	4·45	4·52	367 4
361	5·76	7·66	9·97	12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91	6·66	4·96	4·33	368 4
362	4·86	6·36	8·55	11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24 13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11	369 5
363	5·34	7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	14·00	12·18	9·43	...	...	...	370 2
Sum	756·35	744·88	742·16	734·32	727·44	754·02	737·26	730·49	722·51	731·22	745·07	766·70	798·98	792·90	786·05	787·74	770·67	757·51	753·07	743·23	711·19	699·69	721·89	729·07	No. of Days. 73d 3h.
No.	73	73	73	73	73	74	73	73	73	74	73	73	74	73	73	74	73	73	73	74	73	72	73	72	17944·41

FORMS FOR SHORT-PERIOD TIDES.

Bombay—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - 2\eta + \sigma)$. Series 2SM. Motion per mean Solar hour = $15^{\circ}\cdot5079479$.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	—	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	1 22
2	16·06	16·66	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	—	8·63	2 21
3	11·84	14·68	16·63	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	3 21
4	8·86	12·14	14·87	16·40	—	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	4 20
5	5·25	6·68	9·24	12·28	14·51	15·96	15·58	13·48	10·47	7·54	5·76	—	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	5 19
6	6·22	5·47	5·84	7·18	9·67	12·12	14·04	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	—	12·84	15·06	16·36	16·35	15·24	12·76	6 18
7	10·11	8·00	6·64	6·17	6·55	7·86	9·76	11·80	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	7 18
8	—	11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	8 17
9	13·75	12·27	10·82	9·20	7·93	7·24	—	7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	9 16
10	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	8·96	10·26	—	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10 15
11	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84	13·63	12·58	—	11·38	10·27	9·77	11 14
12	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	12 14
13	9·32	9·14	—	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62	5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	13 13
14	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	—	13·36	11·80	9·66	7·32	5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	14 12
15	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	10·84	8·24	6·20	—	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15 11
16	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	—	14·04	16 10
17	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	17 10
18	15·20	16·55	16·63	15·27	—	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	8·54	18 9
19	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	—	7·60	9·84	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	19 8
20	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28	—	14·56	13·33	10·92	8·30	6·04	4·87	20 7
21	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	21 7
22	—	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	22 6
23	8·32	7·22	7·01	7·74	8·97	10·80	—	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	9·76	11·65	13·04	13·76	13·34	23 5
24	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	—	10·76	8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	24 4
25	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	—	6·08	6·56	7·64	9·14	25 3
26	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78	26 3
27	8·55	10·33	—	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86	6·83	5·22	4·41	27 2
28	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	—	13·76	11·64	9·52	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	28 1
29	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24	6·86	—	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	29 0
30	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	—	15·74	16·28	29 23
31	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	30 23
32	16·84	15·28	11·68	7·88	—	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	31 22
33	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	—	11·40	14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	32 21
34	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94	—	16·48	13·27	9·84	6·84	4·96	4·33	33 20
35	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	34 20
36	—	4·74	5·86	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	10·16	7·86	35 19
37	6·27	5·54	5·86	7·18	9·07	11·36	—	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	14·66	14·44	13·11	11·12	36 18

38	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	—	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	13·34	12·82	37 17
39	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77	—	9·94	10·44	11·32	12·06	38 16
40	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	39 16
41	11·27	11·45	—	11·25	10·76	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	40 15
42	9·56	10·24	10·94	11·36	11·44	10·97	10·10	9·07	—	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	41 14
43	8·67	8·64	9·01	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82	6·94	—	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	42 13
44	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	12·66	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	—	14·84	13·98	43 12
45	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	44 12
46	13·64	11·13	9·02	7·54	—	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	45 11
47	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	—	13·07	14·56	14·85	13·63	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	46 10
48	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50	15·15	13·08	9·90	—	6·94	4·75	3·92	4·66	6·62	9·46	47 9
49	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	11·76	8·44	5·86	4·26	4·25	5·52	—	48 8
50	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	49 8
51	6·70	9·14	12·18	14·74	16·26	16·26	—	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	50 7
52	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	—	4·54	4·69	5·80	7·87	10·40	12·80	14·50	15·06	14·03	11·86	9·36	51 6
53	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06	6·46	8·24	10·33	—	12·41	13·86	14·34	13·44	52 5
54	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	10·14	11·77	12·96	13·40	53 5
55	12·76	11·56	—	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98	5·77	5·38	5·64	6·37	7·82	9·54	11·17	54 4
56	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	—	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	55 3
57	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	—	12·44	12·26	11·27	9·76	7·96	6·27	5·06	4·55	56 2
58	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	12·60	10·86	—	8·63	6·40	57 1
59	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	13·76	11·70	8·84	58 1
60	6·08	4·05	3·42	4·14	—	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	14·57	59 0
61	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	—	17·62	17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	59 23
62	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	—	4·47	3·56	4·02	6·04	9·40	12·86	60 22
63	15·55	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33	7·10	—	61 21
64	10·34	13·76	15·97	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	62 21
65	8·27	11·55	14·34	16·02	16·28	14·66	—	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	63 20
66	4·86	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	—	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	64 19
67	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	—	14·24	13·22	11·36	9·36	65 18
68	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	66 18
69	8·86	—	7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	12·40	12·24	67 17
70	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	—	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	10·56	10·36	10·22	10·36	10·76	11·26	68 16
71	11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08	—	12·36	12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	69 15
72	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	—	9·64	9·08	70 14
73	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	6·74	6·70	7·63	8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	71 14
74	8·16	8·03	8·46	9·64	—	10·86	12·06	12·78	12·56	11·57	9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68	72 13
75	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	—	11·46	9·42	7·27	5·74	5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	73 12
76	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	—	6·24	8·10	10·63	13·22	15·15	15·86	74 11
Sum	755·17	770·71	736·02	778·71	720·68	780·55	717·69	776·94	735·19	762·29	734·14	754·02	764·70	748·80	774·19	745·98	794·17	734·89	797·60	751·32	775·74	736·02	763·71	764·28	No. of Days. 73d 12h.
No.	73	75	72	76	70	76	71	76	72	75	73	73	74	73	75	71	76	70	76	72	75	72	74	74	18173·51

FORMS FOR SHORT-PERIOD TIDES.

Series 2SM.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
77	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34	—	75 10
78	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	76 10
79	15·75	16·73	16·07	13·66	10·42	7·22	—	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	77 9
80	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	—	9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	78 8
81	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	—	13·36	10·24	7·64	6·12	79 7
82	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	80 7
83	6·96	—	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67	81 6
84	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	—	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	82 5
85	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	—	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	83 4
86	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67	8·30	7·06	6·48	6·64	—	7·48	8·86	84 3
87	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76	11·26	12·36	12·92	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	85 3
88	8·34	10·26	12·20	—	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	11·72	9·38	7·17	5·72	86 2
89	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	—	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	14·34	12·05	9·44	87 1
90	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	—	6·40	9·20	12·06	14·62	16·12	16·16	14·90	88 0
91	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	—	88 23
92	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	89 23
93	17·34	16·56	14·28	10·82	7·84	—	5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	90 22
94	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	—	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	91 21
95	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	—	7·14	5·16	4·22	4·76	92 20
96	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	93 20
97	6·16	—	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	94 19
98	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	—	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	95 18
99	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	—	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	96 17
100	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	—	10·81	11·14	97 16
101	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	98 16
102	10·94	11·12	11·02	—	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	99 15
103	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84	—	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	100 14
104	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	—	12·70	14·06	14·56	14·22	12·80	10·96	8·88	101 13
105	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	—	102 12
106	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	103 12
107	11·08	8·22	5·93	4·52	4·32	—	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	104 11
108	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	—	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	105 10
109	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	—	6·14	5·06	5·57	7·24	10·07	106 9
110	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36	107 9
111	11·33	—	14·12	15·97	16·50	15·10	12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	6·07	108 8
112	7·04	9·13	12·00	14·47	15·69	15·54	13·66	—	10·74	7·44	4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	109 7
113	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	7·24	5·36	4·17	4·16	—	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	110 6

114	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	—	13·87	14·87	14·77	111 5
115	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	112 5
116	14·44	13·66	12·26	—	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	113 4
117	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	—	7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	114 3
118	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	—	13·72	13·87	12·97	11·36	9·32	7·66	6·62	115 2
119	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86	11·70	9·34	—	116 1
120	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	117 1
121	8·80	6·96	6·07	6·34	7·48	—	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14	16·26	15·76	118 0
122	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	—	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	118 23
123	16·57	15·46	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	—	3·36	4·67	6·96	9·52	12·56	119 22
124	14·92	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68	120 22
125	13·46	—	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88	6·80	121 21
126	9·18	11·76	14·24	15·56	15·54	14·30	11·86	—	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	122 20
127	6·32	8·22	10·36	12·80	14·56	15·43	14·76	13·04	10·84	8·96	7·76	7·44	7·76	8·80	—	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46	5·35	123 19
128	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	—	11·36	9·58	7·94	124 18
129	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	9·26	125 18
130	7·86	6·96	6·92	—	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	126 17
131	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	—	12·22	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	127 16
132	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	—	11·17	9·96	8·96	8·20	7·92	8·00	8·62	128 15
133	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	—	6·90	129 14
134	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	130 14
135	5·98	6·71	8·26	10·20	12·12	—	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	131 13
136	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	—	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	132 12
137	8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	—	10·02	12·44	14·46	15·64	15·47	133 11
138	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97	134 11
139	15·24	—	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	135 10
140	15·64	16·06	14·62	11·54	7·86	4·52	2·14	—	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	136 9
141	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	—	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	137 8
142	6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	—	12·67	9·57	7·36	138 7
143	6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	139 7
144	7·54	6·48	6·38	—	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	140 6
145	11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	—	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	141 5
146	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	—	7·86	6·87	6·74	7·36	8·54	10·16	11·86	142 4
147	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	—	8·44	143 3
148	10·00	11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	144 3
149	8·26	9·76	11·56	13·14	14·05	—	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	145 2
150	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	—	5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	146 1
151	9·16	7·84	7·36	7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	—	11·03	13·46	15·10	15·52	14·67	147 0
152	12·94	10·67	8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	148 0
153	—	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	148 23
Sum	794·81	752·76	805·37	752·80	797·38	743·69	776·69	756·27	749·30	750·90	750·64	762·48	728·26	781·55	735·82	783·90	734·45	788·40	759·96	766·66	757·82	784·66	788·57	754·70	No. of Days.
No.	76	72	77	72	77	72	76	74	75	75	74	75	73	77	72	77	72	77	73	75	74	75	75	73	74ᵈ 12ʰ. 18357·84

FORMS FOR SHORT-PERIOD TIDES.

Series 2SM.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
154	16·13	15·62	13·90	11·47	9·28	7·84	7·40	—	7·74	8·92	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	149 22
155	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	11·55	13·36	—	14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	150 21
156	11·00	13·46	15·31	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	—	5·04	4·82	5·84	151 20
157	7·60	9·46	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56	152 20
158	6·86	8·64	10·66	—	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	153 19
159	5·94	6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	—	12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	154 18
160	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	—	8·60	9·36	10·36	11·26	11·83	12·05	11·56	155 17
161	10·60	9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	—	11·70	156 16
162	11·97	11·72	11·06	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·29	157 16
163	12·14	12·58	12·36	11·84	11·02	—	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67	158 15
164	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	—	11·38	12·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	159 14
165	8·19	9·46	11·28	13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	—	15·48	14·17	12·02	9·86	8·00	160 13
166	7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	161 13
167	—	6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	162 12
168	9·46	6·32	4·44	3·62	4·30	6·30	8·54	—	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	163 11
169	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53	—	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	164 10
170	16·40	16·14	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55	6·20	—	6·18	7·30	9·60	165 9
171	12·79	15·16	16·42	15·96	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	166 9
172	9·56	12·80	—	15·12	16·05	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	167 8
173	5·93	7·41	10·07	13·02	14·92	15·57	14·68	12·28	9·20	—	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	168 7
174	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	—	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	169 6
175	10·84	8·61	6·86	6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	—	15·54	170 5
176	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	171 5
177	14·75	13·73	12·02	10·10	—	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	172 4
178	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	—	9·06	10·86	12·50	13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	9·33	173 3
179	10·22	11·60	12·90	13·82	13·85	13·68	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	—	14·17	12·86	11·33	10·04	9·14	174 2
180	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	175 2
181	—	8·62	8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77	12·06	176 1
182	10·27	8·84	8·10	7·94	8·52	9·68	11·18	—	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56	15·33	14·70	177 0
183	13·32	11·14	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	—	7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	177 23
184	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	—	7·84	10·40	12·82	178 22
185	14·74	15·56	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	179 22
186	13·67	15·12	—	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	180 21
187	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01	7·37	—	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	181 20
188	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	—	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	182 19
189	5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	—	7·48	183 18
190	6·30	5·87	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	184 18

191	7·90	6·96	6·92	7·56	—	8·50	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	185 17
192	11·12	9·70	8·48	7·63	7·56	8·14	9·04	10·41	11·98	13·30	13·98	—	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	186 16
193	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	—	7·05	6·14	5·87	6·26	7·22	8·72	187 15
194	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	188 15
195	—	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	189 14
196	4·90	6·40	8·62	10·94	13·04	14·57	—	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	7·76	5·44	190 13
197	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	—	7·07	6·90	7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	191 12
198	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	—	13·92	15·05	14·90	192 11
199	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	193 11
200	15·46	13·17	—	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	194 10
201	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	—	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	195 9
202	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	—	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	196 8
203	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26	—	6·86	197 7
204	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	198 7
205	6·30	5·34	5·40	6·24	—	8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	199 6
206	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	—	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	200 5
207	13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	—	9·34	9·14	9·27	9·97	10·90	12·12	201 4
208	13·14	13·41	12·71	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	202 4
209	—	11·74	12·78	13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	203 3
210	9·87	10·64	11·70	12·60	12·94	12·66	—	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	204 2
211	8·94	8·94	9·48	10·50	11·72	12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	—	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	205 1
212	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	—	14·00	15·20	15·33	14·58	206 0
213	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	207 0
214	14·35	12·14	—	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86	207 23
215	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	—	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	208 22
216	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	—	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	209 21
217	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76	—	5·04	6·52	210 20
218	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64	5·14	5·97	211 20
219	7·54	9·60	11·76	13·95	—	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	212 19
220	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	—	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	213 18
221	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	—	8·74	10·52	12·26	13·26	13·32	12·36	214 17
222	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	215 17
223	—	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	216 16
224	13·14	13·55	13·28	12·50	11·34	10·26	—	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	217 15
225	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	—	12·62	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46	218 14
226	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	—	12·80	10·52	8·01	5·84	219 13
227	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	13·21	10·40	7·41	220 13
228	4·97	3·62	—	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	15·72	13·66	221 12
229	10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08	—	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	222 11
Sum	728·84	779·36	729·60	779·67	753·65	788·98	767·05	776·39	782·09	771·24	802·76	750·64	803·99	738·72	804·83	752·32	787·00	765·76	757·79	759·06	750·82	772·23	730·95	775·81	No. of Days. 73d 12h.
No.	71	76	71	75	72	75	73	73	74	72	76	71	76	70	76	72	75	73	74	74	72	75	72	76	18409·55

FORMS FOR SHORT-PERIOD TIDES.

SERIES 2SM.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
230	16·38	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	—	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	223 10
231	16·34	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	—	4·90	7·56	224 9
232	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	225 9
233	8·40	11·50	14·52	16·18	—	16·06	14·38	11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	226 8
234	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	—	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	227 7
235	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	—	12·27	13·74	14·47	14·18	12·78	10·82	228 6
236	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	—	229 5
237	11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	230 5
238	12·12	11·23	9·96	8·64	7·77	7·46	—	7·69	8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	231 4
239	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	—	11·57	12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	232 3
240	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	—	12·36	11·22	10·18	9·34	233 2
241	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34	234 2
242	8·82	8·84	—	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	235 1
243	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	—	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	236 0
244	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	—	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	236 23
245	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	—	11·94	14·36	237 22
246	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	238 22
247	15·80	16·62	16·16	14·21	—	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	239 21
248	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06	5·50	5·18	—	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	240 20
249	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	—	15·38	14·00	11·50	8·72	6·86	5·97	241 19
250	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	—	242 18
251	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	243 18
252	8·97	8·02	7·81	8·36	9·26	10·60	—	12·24	13·73	14·44	13·86	12·25	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	244 17
253	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	—	11·68	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	245 16
254	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	11·74	10·42	8·87	7·44	6·44	—	6·21	6·66	7·76	9·20	246 15
255	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	247 15
256	8·80	—	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	13·40	12·04	10·04	7·64	5·76	4·78	248 14
257	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	—	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44	12·80	10·18	7·37	249 13
258	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	—	5·15	5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29	250 12
259	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	—	15·76	16·64	251 11
260	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	252 11
261	17·05	15·47	12·37	—	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	253 10
262	14·94	16·86	16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	—	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94	6·16	254 9
263	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	—	14·44	11·07	7·87	5·34	3·84	3·92	255 8
264	5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	—	256 7
265	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	257 7
266	5·70	5·63	6·34	7·60	9·36	11·36	—	13·14	13·88	13·60	12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	258 6

267	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	—	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	259 5
268	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	—	9·54	9·86	10·24	10·70	260 4
269	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	261 4
270	10·64	—	11·07	11·18	10·94	10·46	9·52	8·56	7·7[illegible]	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	262 3
271	8·80	9·64	10·44	11·23	11·67	11·60	10·92	9·74	—	8·36	7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	263 2
272	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	—	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	264 1
273	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	—	14·36	12·87	265 0
274	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	266 0
275	12·24	9·07	7·34	—	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	266 23
276	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24	—	13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	267 22
277	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	—	10·52	7·73	5·58	4·88	5·77	7·56	10·04	268 21
278	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	—	269 20
279	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	270 20
280	7·42	9·65	12·22	14·26	15·46	—	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	271 19
281	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	—	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	272 18
282	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	—	12·86	14·16	14·44	13·68	273 17
283	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	274 17
284	13·66	—	12·66	11·40	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	275 16
285	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	—	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	276 15
286	9·84	11·56	13·26	14·17	14·66	14·52	13·27	11·31	9·06	7·37	6·82	7·46	8·74	10·60	—	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	277 14
287	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	—	11·07	8·36	278 13
288	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	279 13
289	7·77	5·85	5·07	—	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	280 12
290	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	—	17·40	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	281 11
291	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	—	6·06	3·77	3·17	4·42	6·67	9·72	13·44	282 10
292	16·23	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04	—	283 9
293	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	284 9
294	8·94	11·94	14·56	16·24	16·32	—	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	7·88	5·80	4·44	4·58	285 8
295	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	—	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	286 7
296	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	—	12·12	12·22	11·46	10·00	8·37	287 6
297	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52	288 6
298	8·47	—	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	289 5
299	10·30	9·78	9·22	8·56	8·06	7·74	8·02	—	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	290 4
300	10·70	10·88	10·82	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	—	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	291 3
301	9·27	10·10	10·90	11·50	11·73	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	—	9·14	7·88	7·18	292 2
302	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	293 2
303	6·50	6·88	7·96	—	9·76	11·52	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	294 1
304	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	—	12·26	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	295 0
305	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	—	6·40	7·67	9·66	11·93	14·14	15·62	15·76	295 23
306	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	—	296 22
Sum	788·17	747·44	781·64	762·08	763·36	764·37	762·95	782·60	746·24	794·36	732·62	794·82	750·16	797·48	759·05	777·70	772·73	754·30	782·03	750·70	778·21	729·88	785·84	728·36	No. of Days.
No.	77	73	76	73	75	75	74	76	73	77	71	77	72	77	73	75	74	74	76	73	76	72	77	71	74d 11h. 18387·09

FORMS FOR SHORT-PERIOD TIDES.

Series 2 SM.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
307	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	14·12	297 22
308	15·94	16·22	14·81	11·87	8·55	—	5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	298 21
309	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	—	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	299 20
310	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96	—	16·12	14·06	11·35	8·82	7·14	300 19
311	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	301 19
312	7·58	—	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	302 18
313	11·01	9·42	8·12	7·64	7·92	8·94	10·40	—	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	303 17
314	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	12·06	12·64	12·40	11·47	—	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	304 16
315	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	—	6·80	7·40	8·84	305 15
316	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	306 15
317	8·35	10·36	12·50	—	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	307 14
318	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	—	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	308 13
319	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46	3·86	—	5·60	8·44	11·74	14·64	16·50	16·72	15·38	309 12
320	12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	—	17·12	310 11
321	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	311 11
322	17·05	16·14	13·92	11·10	8·66	—	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	312 10
323	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	—	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	313 9
324	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	—	8·81	6·52	4·86	4·33	5·20	314 8
325	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	315 8
326	6·66	—	8·34	10·52	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	316 7
327	6·20	6·84	7·96	9·38	11·14	12·91	14·18	—	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	317 6
328	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72	10·53	9·66	—	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	318 5
329	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	8·85	9·16	—	9·64	10·14	10·74	319 4
330	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	320 4
331	10·86	11·50	11·80	—	11·55	10·90	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	321 3
332	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	—	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	13·00	11·72	10·14	8·38	7·03	6·27	322 2
333	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	—	13·14	13·94	13·94	13·04	11·34	9·30	7·45	323 1
334	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87	—	10·56	324 0
335	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	14·20	12·26	325 0
336	9·36	6·51	4·12	2·75	2·94	—	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	325 23
337	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	—	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	326 22
338	15·11	15·17	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	—	6·75	5·63	5·63	6·88	9·32	327 21
339	12·22	14·44	15·50	14·80	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	328 21
340	—	10·06	12·76	14·67	15·26	14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	329 20
341	5·88	7·64	10·25	12·77	14·29	14·72	13·33	—	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	330 19
342	6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	12·68	10·56	8·18	6·28	4·97	—	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	331 18
343	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	—	13·88	14·87	14·84	332 17

344	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	338 17
345	14·40	13·72	12·30	—	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	334 16
346	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	—	5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	335 15
347	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56	12·60	—	14·12	14·40	13·86	12·58	10·80	8·97	7·94	336 14
348	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	13·13	—	10·86	337 13
349	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	12·88	338 13
350	10·26	8·38	7·53	7·40	8·14	—	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	339 12
351	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	—	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	340 11
352	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	—	4·16	5·63	7·85	10·36	13·16	341 10
353	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	342 10
354	—	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	343 9
355	10·34	12·88	15·05	16·23	16·28	14·89	12·63	—	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64	5·07	5·86	344 8
356	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	—	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	6·54	5·59	345 7
357	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	—	11·15	9·47	8·01	346 6
358	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	347 6
359	8·46	7·76	—	7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70	11·62	348 5
360	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	—	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	349 4
361	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	—	11·55	10·26	8·86	7·83	7·22	7·36	7·86	8·85	350 3
362	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	—	6·15	351 2
363	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75	4·90	352 2
364	4·92	6·07	7·94	10·07	—	12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	8·50	6·30	353 1
365	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	—	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	13·00	10·50	354 0
366	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	—	10·00	12·15	14·04	15·14	15·03	354 23
367	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	355 23
368	—	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	356 22
369	15·24	16·17	14·94	12·16	8·55	5·06	2·64	—	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64	7·65	357 21
370	10·63	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	—	12·30	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14	4·70	358 20
371	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38	17·48	15·95	—	12·86	9·53	6·72	359 19
372	5·22	4·90	5·87	8·03	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	8·76	360 19
373	6·38	5·17	—	5·13	6·30	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32	361 18
374	10·86	8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	—	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	362 17
375	13·66	12·28	10·12	8·24	6·78	5·82	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	—	10·24	9·12	8·42	8·24	8·54	9·54	11·12	12·64	363 16
376	13·57	13·57	12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	8·58	8·66	—	9·44	364 15
377	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	10·28	9·14	8·62	8·63	365 15
378	9·20	10·44	11·66	12·53	—	12·92	12·58	11·64	9·77	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	366 14
379	8·44	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	9·64	7·34	—	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	13·73	11·82	367 13
380	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	—	8·55	11·00	13·44	15·21	15·84	15·17	368 12
381	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94	369 12
382	—	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	370 2
Sum	738·82	775·73	774·76	744·42	750·88	742·91	762·09	706·44	754·79	703·22	756·55	713·75	745·27	744·18	750·76	748·91	747·20	771·79	735·30	783·92	726·70	780·74	722·69	778·69	No. of Days.
No.	72	74	74	73	74	72	76	71	76	71	76	72	74	73	74	73	72	74	70	75	70	75	70	75	73d 4h. 17960·51

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(\gamma - 2\sigma + \varpi)$. SERIES 2N. Motion per mean Solar hour = $13^{\circ}.9476774$.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15.52	12.96	9.13	5.76	3.03	1.68	2.28 4.80	7.90	11.70	15.50	18.00	18.85	18.08	15.14	11.54	8.50	6.21	5.53	6.08	8.20 11.31	14.16	16.06	16.66	15.40	2 1
2	12.16	8.40	4.86	2.56	1.71	2.90	5.56	8.82	12.94	16.44 18.58	18.97	17.67	14.24	10.56	7.53	5.57	5.16	6.10	8.63	11.84	14.68	16.63	16.96 15.24	11.92	3 3
3	8.00	4.87	2.80	2.57	4.24	6.84	10.20	14.07	17.26	18.86	18.84	17.06 13.20	9.77	6.90	5.23	4.96	6.16	8.86	12.14	14.87	16.40	16.40	14.28	11.00	4 4
4	7.63 4.88	3.55	3.86	5.55	8.01	11.36	14.83	17.16	18.38	17.93	15.80	12.16	8.68	6.10	5.05 5.25	6.68	9.24	12.28	14.51	15.96	15.58	13.48	10.47	7.54	5 6
5	5.76	5.07	5.67	7.22 9.17	12.11	15.02	17.02	17.55	16.63	14.11	10.96	8.16	6.22	5.47	5.84	7.18	9.67 12.12	14.04	15.00	14.45	12.62	10.24	8.07	7.04	6 8
6	6.84	7.54	8.67	10.60	12.84	15.06 16.36	16.35	15.24	12.76	10.11	8.00	6.64	6.17	6.55	7.86	9.76	11.80	13.27	14.00	13.64 12.22	10.47	9.05	8.44	8.46	7 10
7	9.03	9.97	11.20	13.05	14.64	15.46	15.18	13.87	11.68 9.76	8.10	7.16	7.03	7.40	8.29	9.82	11.16	12.55	13.24	13.07	12.20	11.16	10.27 9.64	9.60	9.90	8 12
8	10.60	11.70	12.96	14.02	14.44	13.75	12.27	10.82	9.20	7.93	7.24 7.06	7.34	8.07	9.14	10.55	11.74	12.48	12.66	12.27	11.60	10.93	10.34	9.98	9.86	9 13
9	10.17 11.07	12.14	13.06	13.36	12.72	11.71	10.43	9.14	7.97	7.14	6.75	6.94	7.74	8.96 10.26	11.64	12.67	13.14	12.97	12.20	11.24	10.48	10.12	10.05	10.23	10 15
10	10.84	11.64	12.27 12.68	12.37	11.53	10.42	8.97	7.80	6.96	6.38	6.44	7.28	8.73	10.47	12.14	13.23 13.84	13.63	12.58	11.38	10.27	9.77	9.62	9.89	10.44	11 17
11	11.24	11.97	12.52	12.50	11.87	10.54 8.76	7.34	6.16	5.74	6.34	7.62	9.54	11.46	13.22	14.24	14.58	13.94	12.72	11.24 10.02	9.32	9.14	9.46	10.37	11.48	12 19
12	12.46	13.04	12.84	11.88	10.23	8.20	6.52	5.62 5.56	6.50	8.14	10.17	12.34	14.10	15.20	15.17	13.97	12.27	10.58	9.35	8.75	8.76 9.26	10.34	11.68	12.96	13 21
13	13.64	13.36	11.80	9.66	7.32	5.82	5.14	5.44	6.74	8.86	11.26 13.66	15.38	15.87	15.24	13.66	11.54	9.82	8.71	8.16	8.36	9.30	10.74	12.46	13.61 13.98	14 23
14	13.00	10.84	8.24	6.20	4.76	4.46	5.40	7.36	9.78	12.57	14.82	16.13	15.97 14.56	12.25	10.05	8.46	7.82	7.74	8.41	9.71	11.76	13.30	14.26	14.09	16 0
15	12.44	9.76 7.00	5.12	4.20	4.63	6.12	8.44	11.24	14.04	15.74	16.36	15.71	13.82	11.22	8.94	7.54 6.94	7.15	8.40	10.27	12.44	14.06	14.68	13.84	11.50	17 2
16	8.60	5.94	4.37	4.02	5.06 7.26	9.66	12.72	15.20	16.55	16.63	15.27	12.77	9.97	7.86	6.84	6.68	7.56	9.32 11.40	13.55	14.80	14.78	13.22	10.43	7.48	18 4
17	5.34	4.30	4.66	6.25	8.54	11.38	14.15 16.15	16.88	16.08	14.04	11.02	8.54	6.76	6.12	6.34	7.60	9.84	12.14	14.06	14.84	14.14 12.06	9.06	6.46	4.67	19 6
18	4.24	5.16	7.15	9.68	12.56	14.87	16.44	16.45	15.00	12.42 9.50	7.22	5.80	5.43	6.26	8.16	10.65	12.88	14.28	14.56	13.33	10.92	8.30	6.04 4.87	5.06	20 8
19	6.54	8.66	11.04	13.64	15.62	16.36	15.76	13.82	11.00	8.37	6.37	5.54	5.64 6.83	8.93	11.40	13.32	14.42	14.25	12.47	10.10	7.91	6.34	5.70	6.30	21 9
20	7.70	9.76 12.17	14.36	15.74	15.96	14.86	12.76	10.13	7.78	6.17	5.70	6.11	7.62	9.70	11.76 13.36	14.14	13.72	12.06	9.94	8.32	7.22	7.01	7.74	8.97	22 11
21	10.80	12.97	14.62	15.50 15.17	13.80	11.46	9.14	7.34	6.17	6.00	6.68	8.02	9.76	11.65	13.04	13.76	13.34	12.14 10.65	9.07	8.15	8.14	8.68	9.86	11.56	23 13
22	13.36	14.56	15.02	14.37	12.76	10.76	8.71 6.96	6.23	6.00	6.68	7.86	9.46	11.24	12.66	13.36	13.34	12.38	11.08	9.94	9.11 8.88	9.28	10.22	11.70	13.06	24 15
23	14.14	14.41	13.60	12.06	10.26	8.46	7.10	6.25	6.08 6.56	7.64	9.14	10.84	12.34	13.44	13.81	13.33	12.18	10.75	9.76	9.24	9.34	10.07	11.16 12.40	13.38	25 17
24	13.66	13.03	11.87	10.24	8.47	7.00	5.83	5.38	5.68	6.78	8.55	10.33 12.22	13.56	14.30	14.16	13.05	11.56	10.06	9.11	8.87	9.40	10.46	11.87	12.94	26 18
25	13.44 13.33	12.40	10.74	8.86	6.83	5.22	4.41	4.77	6.10	8.10	10.50	12.63	14.53	15.56 15.33	13.76	11.64	9.52	8.28	7.92	8.25	9.53	11.24	12.70	13.80	27 20
26	14.14	13.30	11.34	8.72 6.20	4.24	3.38	3.76	5.30	7.76	10.55	13.50	15.72	16.74	16.12	14.36	11.40	8.83 7.24	6.86	7.53	9.20	11.11	12.97	14.55	15.08	28 22
27	14.17	11.84	8.82	5.70	3.60	2.56 3.06	5.04	7.88	11.48	14.56	17.04	17.86	17.00	14.36	10.96	8.07	6.27	5.77	6.57 8.62	11.25	13.92	15.74	16.28	14.96	30 0
28	12.18	8.44	5.42	3.22	2.16	3.07	5.52	8.75	12.46 16.01	18.10	18.47	17.26	13.80	10.14	7.09	5.27	5.02	6.02	8.40	11.85	14.65	16.52 16.84	15.28	11.68	31 2
29	7.88	4.80	2.74	2.38	4.00	6.66	10.10	13.98	17.01	18.64	18.38 16.30	12.42	8.97	6.01	4.46	4.57	6.12	9.14	12.56	15.46	17.00	16.86	14.76	11.06 7.36	32 4
30	4.34	2.72	2.99	4.86	7.74	11.40	14.94	17.54	18.47	17.66	14.67	11.08	7.54	5.01 3.93	4.32	6.55	9.62	13.04	15.80	16.84	16.08	13.73	10.16	6.82	33 5
31	4.54	3.58	4.44 6.36	9.36	12.84	15.86	17.74	17.94	16.48	13.27	9.84	6.84	4.96	4.33	5.26	7.44 10.66	13.70	15.74	16.43	15.42	12.82	9.66	6.90	5.42	34 7
32	5.14	6.20	8.06	10.66	13.66 16.02	17.12	16.74	14.88	11.68	8.76	6.34	4.92	4.74	5.86	8.26	11.07	13.60	15.16	15.34 14.06	11.68	9.04	7.34	6.56	6.94	35 9
33	8.04	9.56	11.76	14.24	15.60	16.04	15.34	13.02 10.16	7.86	6.27	5.54	5.86	7.18	9.07	11.36	13.26	14.34	14.26	12.88	11.00	9.39 8.26	7.92	8.30	9.05	36 11
34	10.36	12.08	13.76	14.66	14.44	13.11	11.12	9.30	7.54	6.26 6.13	6.68	7.86	9.28	10.86	12.27	13.10	12.94	11.93	10.66	9.72	9.12	9.06	9.26	9.66 10.60	37 13
35	11.82	12.86	13.34	12.82	11.45	10.03	8.74	7.48	6.86	6.78	7.17	7.94	9.05 10.50	11.34	11.97	11.92	11.42	10.84	10.34	10.07	9.97	9.77	9.94	10.44	38 14

36	11·32	12·06 12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56 11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	39 16
37	11·27	11·45	11·25	10·76	9·97 9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30	11·60 10·57	9·76	9·34	9·17	9·56	10·24	10·94	40 18
38	11·36	11·44	10·97	10·10	9·07	7·87	6·85 6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67 8·64	9·01	9·76	10·58	11·25	41 20
39	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82	6·94	8·54 10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52 12·40	12·66	42 22
40	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67 14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	13·60	43 23
41	12·30 10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02 7·54	6·79	7·00	8·13	9·87	11·85	13·60	14·38	13·88	11·93	45 1
42	9·10	6·54	4·66	4·00 4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74 8·48	10·85	13·07	14·56	14·85	13·63	10·90	7·86	46 3
43	5·57	4·07	4·04	5·46	7·84	10·63 13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50 15·15	13·08	9·90	6·94	4·75	47 5
44	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00 11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	11·76	8·44 5·86	4·26	4·25	48 7
45	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65 4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	49 8
46	6·70 9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74 12·44	14·55	15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	50 10
47	10·77	13·32	15·42 16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	10·40	12·80	14·50	15·06 14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	51 12
48	13·73	15·08	15·32	14·12	11·86	9·24 6·90	5·18	4·58	5·06	6·46	8·24	10·33	12·41	13·86	14·34	13·44	11·46	9·53	8·05 7·40	7·66	8·58	9·92	11·68	13·36	52 14
49	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92 5·44	6·63	8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67 9·76	11·20	12·50	13·18	53 16
50	13·06	11·88	10·25	8·57	6·98	5·77	5·38	5·64	6·37	7·82	9·54 11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34 12·34	54 18
51	11·70	10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16 13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44	55 19
52	12·26	11·27	9·76 7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66 8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	56 21
53	12·60	10·86	8·63	6·40	4·63 4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18 7·03	8·83	11·00	12·96	14·40	14·74	13·76	57 23
54	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80 12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67 15·38	15·86	14·57	11·93	59 1
55	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62 17·34	15·27	11·66	8·27	5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66 11·26	7·66	60 3
56	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96 4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	13·86	10·44	6·92	61 4
57	4·54	3·37 3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	3·27	4·33 7·10	10·34	13·76	15·97	16·76	15·76	12·96	9·44	6·74	4·67	62 6
58	4·23	5·26	7·43	10·37 13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02 16·28	14·66	11·66	8·60	6·46	5·26	5·46	63 8
59	6·56	8·86	11·44	14·36	15·97	16·18	14·88 12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46 8·22	6·76	6·34	7·00	8·36	64 10
60	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93 4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42 9·82	11·34	65 12
61	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00 10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36	66 13
62	12·44 13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	12·88 12·88	12·24	11·43	10·66	10·24	10·16	10·24	10·47	10·86	11·44	12·02	67 15
63	12·40	12·24	11·36	10·18 8·87	7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26 10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	68 17
64	11·38	10·86	9·96	9·14	8·40	7·98 7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03	11·50	10·78	10·20	9·73 9·58	9·87	10·35	10·89	11·10	11·10	69 19
65	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97 10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74 11·40	11·75	11·70	70 21
66	11·14	10·07	8·84	7·56	6·74	6·70	7·63	8·94	10·62	12·06	13·26 13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56 11·57	71 23
67	9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	10·68 8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	73 0
68	9·42	7·27	5·74 5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07 6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	74 2
69	6·26	5·16	5·12	6·24	8·10 10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95 15·20	15·12	13·39	10·64	7·57	5·44	75 4
Sum	747·71	694·17	689·93	694·26	690·35	720·01	732·20	740·10	786·83	800·63	807·04	784·97	769·73	769·60	745·62	768·17	759·58	795·87	821·34	832·74	823·49	803·67	804·80	763·37	No. of Days.
																									74d 5h.
No.	75	73	74	75	74	75	74	73	75	74	75	73	74	75	74	75	73	74	75	75	74	73	75	74	18346·18

FORMS FOR SHORT-PERIOD TIDES.

Series 2N.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
70	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06 / 14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86 / 9·54	6·67	4·92	4·38	76 6
71	5·53	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22 / 4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99 / 6·52	77 8
72	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60 / 9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	78 9
73	10·46	13·38 / 15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92 / 16·74	15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	79 11
74	13·90	15·66	15·98	14·76	12·06 / 8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02 / 8·05	6·96	7·06	7·93	9·67	12·07	14·08	80 13
75	15·23	15·08	13·57	11·16	8·26	6·08	4·76 / 4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14 / 9·06	10·62	12·40	13·77	14·52	81 15
76	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52 / 11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06 / 13·60	13·34	82 17
77	12·06	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08 / 14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	83 18
78	12·44 / 11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12 / 10·36	8·96	8·11	7·96	8·44	9·76	11·26	12·36	12·92	12·78	84 20
79	11·94	10·50	8·78	7·20 / 6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90 / 6·56	7·46	9·22	11·16	12·56	13·57	14·06	13·37	85 22
80	11·72	9·38	7·17	5·72	5·38	6·17 / 7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24 / 13·46	14·86	15·36	14·34	12·05	87 0
81	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60 / 16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16 / 14·90	12·22	9·12	88 2
82	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58 / 10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	89 3
83	6·27 / 5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25 / 5·24	7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	90 5
84	5·42	6·12	7·87 / 10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74 / 16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	91 7
85	7·22	9·26	12·02	14·66	16·44	16·67 / 15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	13·22	15·56	16·90	16·56	14·74 / 11·68	8·84	7·02	6·48	7·04	8·26	92 9
86	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14 / 5·16	4·22	4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28 / 8·03	9·50	11·53	93 11
87	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85 / 9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04 / 13·48	94 13
88	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05 / 14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	95 14
89	12·96	12·28	10·94 / 9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96 / 10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	96 16
90	11·54	10·36	9·16	8·12	7·47 / 7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77 / 9·87	10·02	10·36	10·81	11·14	11·27	10·92	97 18
91	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87 / 11·04	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53 / 10·94	11·12	11·02	10·62	98 20
92	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	11·77	12·66 / 13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89 / 11·44	10·50	99 22
93	9·40	8·46	7·84	7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42 / 10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	100 23
94	9·52	8·12 / 7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81 / 6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	102 1
95	7·48	6·74	6·92	7·97 / 9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16 / 14·02	15·18	15·06	13·40	10·95	8·28	6·66	103 3
96	6·02	6·46	7·88	10·06	12·53	14·55	15·72 / 15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36	16·20	15·32 / 13·00	9·88	7·34	5·76	5·40	104 5
97	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46 / 6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47 / 5·38	6·52	105 7
98	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76 / 6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	106 8
99	10·07 / 13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33 / 16·70	17·72	16·91	14·37	10·87	8·10	6·15	5·71	6·50	8·36	11·33	107 10
100	14·12	15·97	16·50	15·10 / 12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40 / 10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	108 12
101	15·69	15·54	13·66	10·74	7·44	4·88 / 3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	6·76 / 6·80	7·71	9·70	12·14	14·15	15·02	109 14
102	14·50	12·53	9·92	7·24	5·36	4·17	4·16	5·20	7·26 / 9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58 / 13·16	13·74	13·28	110 16
103	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87 / 14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72 / 11·58	111 18
104	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26 / 10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	112 19

105	10·96	9·47	8·14 7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74 6·96	6·96	7·85	9·40	10·96	12·36	13·06	13·12	12·22	113 21
106	10·65	8·87	7·52	6·74	6·84 7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00 11·04	12·64	13·72	13·87	12·97	11·36	114 23
107	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96 14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66 14·94	13·86	11·70	9·34	116 1
108	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44 12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	8·80 6·96	117 3
109	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77 3·70	5·12	7·30	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	6·47	118 4
110	5·97	6·54 7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48 11·42	14·32	16·17	16·57	15·46	12·94	10·06	7·64	6·36	6·16	119 6
111	6·82	8·40	10·90	13·45	15·07 15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36	16·28 14·70	11·93	9·06	7·20	6·40	6·70	7·74	120 8
112	9·37	11·47	13·86	15·04	15·06	12·96	9·73 7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22 6·72	6·40	7·02	8·34	10·44	121 10
113	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86	4·88 6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86	9·36 11·24	13·06	122 12
114	13·96	13·66	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80 14·56	15·43	14·76	13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	123 13
115	13·30 12·28	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06 10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	124 15
116	11·36	9·58	7·94	6·74 6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46 8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·72	125 17
117	9·26	7·86	6·96	6·92	7·44	8·22	9·26 10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34 10·96	11·44	11·34	10·58	9·56	126 19
118	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24 13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29 10·79	10·06	9·26	127 21
119	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17 9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	128 22
120	8·78 8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26 6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	130 0
121	8·06	7·83	8·24 9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20 12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	131 2
122	7·27	7·93	9·36	11·30	13·16	14·26 14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34 14·46	12·38	10·01	8·14	6·95	6·90	132 4
123	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76 8·83	6·14	4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14 6·17	6·50	7·92	133 6
124	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74 4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94 10·30	134 8
125	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62 13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	135 9
126	13·74	15·64	16·06 14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77 14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	136 11
127	15·72	15·74	13·76	10·48	6·92 4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30 5·76	5·60	6·58	8·80	11·97	14·34	15·47	137 13
128	15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46 6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	6·11	7·20	9·40 12·06	14·14	14·98	14·36	138 15
129	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	10·44	13·15 15·36	16·54	16·23	14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98 13·42	11·66	139 17
130	9·36	7·30	5·74	4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00 11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	140 18
131	10·08	8·18 6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84 6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	141 20
132	9·35	7·86	6·87	6·74 7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	7·12 8·94	10·74	12·22	12·86	12·65	11·60	10·06	142 22
133	8·56	7·47	7·24	7·70	8·44	10·00	11·62 13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46 13·44	13·42	12·46	10·72	9·12	144 0
134	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05	13·96 12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36 9·64	8·16	145 2
135	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72 4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	146 3
136	7·36 7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16 8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	7·60	7·38	147 5
137	7·93	9·10	10·86	12·73 14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74 15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	148 7
138	9·70	11·80	13·62	14·54	14·16	12·22 9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47 9·28	7·84	7·40	7·74	8·92	10·62	149 9
Sum	753·59	728·67	742·32	746·48	732·84	732·41	725·03	731·56	728·62	734·37	716·89	741·07	774·16	777·63	810·66	789·71	828·49	817·00	801·22	801·81	775·74	773·18	776·86	753·78	No. of Days.
No.	75	73	74	75	74	74	74	75	74	75	73	74	75	74	75	72	75	75	74	75	73	74	75	74	$74^d\ 5^h$. 18194·09

FORMS FOR SHORT-PERIOD TIDES.

Series 2 N.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
139	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17 5·26	7·20	9·70	12·28	14·61	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10 9·52	11·55	13·36	150 11
140	14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00 13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66 14·02	151 13
141	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87	14·10	15·30	15·60	14·66 12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	152 14
142	11·96	9·94	7·67 6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46 7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98	153 16
143	9·18	7·32	6·03	5·94	6·87 8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24 11·40	12·12	12·46	11·72	10·38	8·77	154 18
144	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54 14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	11·83	12·05 11·56	10·60	9·20	8·14	155 20
145	7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26 11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86 8·32	156 22
146	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20 8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06	9·23	157 23
147	8·78	9·20 10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67 9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	159 1
148	10·17	11·38	12·77	13·98	14·67 15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28	13·22	14·76	15·82 15·76	14·97	13·34	11·70	10·67	10·27	10·56	160 3
149	11·52	12·90	14·12	15·30	15·65	15·48	14·17 12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	16·85	15·70	13·60	11·52 9·95	9·55	9·80	10·84	161 5
150	12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16	4·95 5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96 10·27	12·23	162 7
151	14·24	15·74	16·29	15·33	12·77	9·46	6·32	4·44	3·62	4·30	6·30	8·54 11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	163 8
152	14·54	16·07 16·21	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53 17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	164 10
153	16·40	16·14	14·28	10·90 7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·4[illegible]	18·12	18·40	17·00	13·80	10·17 7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	165 12
154	15·96	13·80	10·33	6·77	4·00	2·33	2·54 4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00 9·56	12·80	15·12	16·05	15·26	166 14
155	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04 14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07	13·02	14·92 15·57	14·68	12·28	167 16
156	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60 14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85	14·05	11·96	168 17
157	9·47 7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61 6·86	6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34	169 19
158	8·60	7·57	7·26 7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78 9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	170 21
159	8·66	8·31	8·49	9·03	10·30	12·04 13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32 13·20	13·38	12·92	11·94	10·67	9·60	171 23
160	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10 13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46 11·06	10·06	9·30	173 1
161	9·05	9·33	10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00 6·70	6·08	6·22	7·28	9·00	10·9[illegible]	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14 8·86	174 3
162	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85	7·06	5·67	5·05	5·60 7·15	9·26	11·30	13·28	14·45	14·84	13·9[illegible]	12·40	10·90	9·46	8·62	8·24	175 4
163	8·56	9·64	11·12 12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01 15·00	14·80	13·77	12·06	10·27	8·84	8·10	7·94	8·52	176 6
164	9·68	11·18	12·64	13·37	13·05 11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56	15·33	14·70	13·32 11·14	9·44	8·17	7·54	7·57	8·34	9·81	177 8
165	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38 4·04	4·96	6·82	9·02	11·57	13·86	15·24	15·44	14·56	12·56	10·36	8·63	7·62	7·30 7·74	8·86	10·67	12·47	178 10
166	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	7·84 10·40	12·82	14·74	15·56	15·33	13·80	11·44	9·35	7·79	7·01	7·03	7·90	9·44	11·66 13·22	13·92	179 12
167	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12	15·46 14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	180 13
168	12·22	9·64 6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01 7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	181 15
169	8·44	6·12	4·72	4·42 5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16 9·92	11·66	12·82	13·10	11·86	9·72	7·36	182 17
170	5·70	5·02	5·24	6·42	8·07	10·12	11·98 13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77 12·64	11·27	9·34	7·48	6·30	183 19
171	5·87	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20 12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90 6·96	6·92	184 21
172	7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94 6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	185 22
173	8·14 9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86 9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	187 0

174	9·04	10·37	11·82	13·16 13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56 12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	188 2
175	10·46	11·88	13·12	13·48	12·96	11·86 10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10 10·48	9·04	8·28	8·37	8·98	10·28	189 4
176	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76 4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62 8·40	10·00	11·70	190 6
177	13·12	13·97	13·69	12·32	10·27	7·76	5·44	3·88	3·19	3·88	5·80 8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54	11·60 13·35	191 8
178	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76 17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30	11·84	13·92	192 9
179	15·05	14·90	13·08 9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54 9·04	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	193 11
180	15·46	13·17	9·32	5·65	2·96 1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	4·98 6·66	9·72	13·12	15·46	16·44	15·54	194 13
181	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60 11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24 15·56	16·37	15·10	12·10	195 15
182	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38 17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60 8·45	196 17
183	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26 6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	197 18
184	6·43	5·40 5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	6·24 8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	198 20
185	7·24	7·56	8·14	9·16	11·11 13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30 13·38	13·40	12·62	11·34	10·16	9·24	8·58	199 22
186	8·59	8·86	9·62	10·96	12·55	13·78	14·07 13·40	11·92	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87 10·93	10·01	9·34	9·14	201 0
187	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77	8·47 7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04 9·53	9·52	202 2
188	9·76	10·73	11·74	12·78	13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76 7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	203 3
189	9·87	10·64 11·70	12·60	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07 13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	9·48	204 5
190	10·50	11·72	12·63	13·06 12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54 13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	205 7
191	11·74	13·14	13·52	12·81	11·24	9·13	7·31 5·74	5·33	6·10	7·65	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37 8·18	8·73	9·62	10·95	12·64	206 9
192	13·76	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52 8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99 11·82	13·73	14·66	207 11
193	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	11·77	14·22	15·86 16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	208 12
194	13·28 10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11	14·47	11·94 9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	209 14
195	9·57	6·78	5·10 4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89 8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	210 16
196	5·86	4·76	5·04	6·52	8·34	10·66 13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54 14·58	14·24	12·42	9·84	7·44	5·64	211 18
197	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83 14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97 7·02	5·96	5·96	212 20
198	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95 5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24 8·26	213 22
199	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34 8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	214 23
200	10·16	11·76	13·33 14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96 13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	216 1
201	12·02	13·24	14·10	14·04	13·02 11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50 11·34	10·26	9·52	9·35	9·67	10·59	11·83	217 3
202	12·88	13·62	13·44	12·54	11·15	9·50	7·86	6·50 5·94	6·16	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05 9·15	9·96	11·33	12·62	218 5
203	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46 8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16 12·57	13·70	219 7
204	14·26	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24 16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	220 8
205	15·18	14·86 13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84 12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	221 10
206	15·72	13·66	10·33	6·96 4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54 5·95	7·72	10·60	13·60	16·07	17·04	16·38	222 12
207	13·96	10·25	6·47	3·74	2·56	3·20	5·12 8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36 13·94	16·34	17·16	16·04	13·12	223 14
Sum	771·66	787·20	751·76	713·79	707·19	675·03	701·71	723·74	725·52	770·91	772·60	818·81	836·86	831·11	822·89	796·02	778·33	787·64	778·57	777·03	812·92	819·81	812·76	818·97	No. of Days.
No.	72	75	75	74	75	72	75	75	74	75	73	74	75	74	74	74	74	75	74	73	75	75	74	75	74ᵈ 5ʰ. 18592·83

FORMS FOR SHORT-PERIOD TIDES.

Series 2N.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
208	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94 / 17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39 / 12·15	8·23	224 16
209	5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80 / 8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	225 17
210	5·62 / 4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10 / 4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	6·32	226 19
211	5·74	6·44	7·77	9·72 / 12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87 / 13·60	14·46	13·96	12·48	10·40	8·65	7·45	7·28	227 21
212	8·00	9·26	10·72	12·27	13·74	14·47 / 14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85 / 11·76	10·70	9·74	9·12	8·90	9·34	228 23
213	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17 / 7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07 / 9·67	9·77	10·12	230 1
214	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69 / 8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14 / 10·50	231 3
215	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57 / 12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92	9·63	10·00	232 4
216	10·71	11·62	12·32 / 12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66 / 13·26	12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	233 6
217	11·64	12·26	12·35	11·85	10·40	8·78 / 7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	10·70	9·34 / 8·82	8·84	9·26	10·00	11·16	12·50	234 8
218	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14 / 7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96 / 10·06	11·56	13·12	13·97	235 10
219	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66 / 15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62 / 13·44	236 12
220	11·00	8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08 / 11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	237 13
221	10·00	7·37 / 5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10 / 6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	238 15
222	6·26	4·97	5·06	6·36	8·22 / 10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	7·13	9·22	11·84 / 14·36	15·71	15·48	13·64	10·66	7·60	5·70	239 17
223	4·96	5·70	7·24	9·54	12·02	14·56	16·24 / 16·56	15·34	12·80	9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52 / 9·63	7·07	5·74	5·64	240 19
224	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	8·16 / 6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97 / 6·34	7·52	241 21
225	9·30	11·47	13·80	15·46	15·84	14·77	12·44	9·37	7·06	5·37	4·85	5·64 / 7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	242 22
226	10·38	12·36 / 14·06	15·24	15·10	13·64	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96	13·64 / 14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	244 0
227	12·24	13·73	14·44	13·86 / 12·25	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44 / 11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	245 2
228	13·06	13·46	13·08	11·68	9·86	8·26	6·87 / 6·17	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16 / 9·18	9·63	10·54	11·48	12·46	246 4
229	12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21	6·66 / 7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86 / 10·86	12·02	12·84	247 6
230	12·98	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80 / 14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	248 7
231	13·74 / 13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74 / 14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	249 9
232	14·44	12·80	10·18 / 7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27 / 5·15	5·63	7·24	9·64	12·52	14·74	15·98	15·46	250 11
233	13·29	9·94	6·63	4·34	3·17	2·53 / 5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80 / 10·06	13·28	15·76	16·64	15·75	12·94	251 13
234	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20 / 15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05 / 15·47	12·37	8·44	252 15
235	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77 / 10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00 / 5·38	253 17
236	3·90	4·20	5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70 / 2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47	254 18
237	4·87	5·60	7·04 / 9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36 / 13·44	15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36	255 20
238	7·02	8·54	10·58	12·80	14·58 / 15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77 / 13·46	11·46	9·44	8·00	7·36	7·56	8·36	256 22
239	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73 / 6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60	12·43	10·94	9·64	8·76 / 8·44	8·70	9·18	9·95	258 0
240	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67 / 7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34 / 9·87	10·66	259 2
241	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90 / 11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	260 3
242	10·70	10·91 / 10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06 / 11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	261 5

243	11·05	11·18	10·94	10·46 9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85 8·96	8·54	8·42	8·86	9·64	10·44	11·23	262 7
244	11·67	11·60	10·92	9·74	8·36	7·26	6·68 6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74 8·74	9·92	11·30	12·38	12·82	263 9
245	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	9·68 11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16 13·44	12·50	264 11
246	10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36 12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	265 12
247	10·30 7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34 5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	266 14
248	6·94	5·36	4·94	5·94 8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44 11·24	13·97	15·67	15·66	14·20	11·46	8·47	6·20	267 16
249	4·97	5·22	6·65	8·86	11·54	14·06 15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80 13·61	10·52	7·73	5·58	4·88	268 18
250	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64 7·47	5·10	3·54	3·83	5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97 5·54	5·42	6·51	269 20
251	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67 4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	270 21
252	9·65 12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	9·97	12·69 14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	271 23
253	12·56	14·16	14·83 14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13 12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	273 1
254	13·74	13·97	12·81	10·83	8·83	7·10 5·78	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	10·86	9·52	8·53 8·21	8·56	9·40	10·68	12·08	13·04	274 3
255	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30 7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10 10·17	11·30	12·30	12·61	275 5
256	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10 13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52 12·48	276 7
257	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66 14·52	13·27	11·31	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	277 8
258	13·84	12·76 10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63 6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	278 10
259	13·48	11·07	8·36	6·38	5·47 5·87	7·36	9·62	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61	5·14	5·74 7·77	10·54	13·45	15·71	16·85	16·30	14·16	279 12
260	10·84	7·77	5·85	5·07	5·66	7·50	9·87 12·74	15·25	16·92	17·15	15·62	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70 17·32	16·33	13·48	9·84	280 14
261	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40	16·86 14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76 9·26	6·56	281 16
262	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	12·71	9·14	6·06 3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	282 17
263	5·44	6·06 7·47	10·01	12·74	15·12	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04 11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	283 19
264	6·91	8·53	10·52	13·06 15·02	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24 16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	284 21
265	9·30	11·26	13·26	14·41	14·26	12·74	10·35 7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11 7·80	7·42	7·74	8·64	10·04	285 23
266	11·80	13·04	13·64	13·06	11·36	9·07	7·14	5·84	5·47 6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54 9·26	10·30	11·46	287 1
267	12·12	12·22	11·46	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24 12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	288 2
268	11·52 11·46	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66 11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	289 4
269	10·66	10·30	9·78 9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97 9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	290 6
270	10·82	10·57	10·03	9·26	8·44	7·90 8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12 8·56	9·27	10·10	10·90	11·50	11·78	291 8
271	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74 11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94 12·78	12·88	12·06	292 10
272	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04 13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48 10·52	293 12
273	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84 6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96	294 13
274	7·92	6·50	6·22 7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60 9·03	11·80	14·15	15·84	15·96	14·52	12·00	9·24	7·24	295 15
275	6·16	6·40	7·67	9·66	11·93 14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67 16·78	16·26	14·16	11·00	8·32	6·36	5·84	296 17
276	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28 9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44 7·71	6·07	5·84	6·88	297 19
Sum	725·25	709·21	714·11	715·11	718·09	748·25	757·39	774·00	777·74	745·74	771·49	753·66	733·03	746·95	729·65	772·71	800·69	815·81	817·37	814·37	829·91	812·02	776·11	749·42	No. of Days.
No.	74	74	75	74	73	75	74	75	75	72	75	75	74	75	72	75	75	74	74	73	75	75	74	74	74d 5h. 18308·08

SERIES 2 N.—(*Continued*).

Day	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
277	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46 2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04 7·36	9·64	298 21
278	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	10·55 13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	299 22
279	12·68	14·78 15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96 16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	301 0
280	14·64	15·04	13·76	11·47 8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86 7·58	7·14	7·44	8·84	10·92	12·84	13·84	302 2
281	13·86	12·57	10·68	8·54	6·84	5·56	5·27 5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	7·92 8·94	10·40	11·85	12·91	13·12	303 4
282	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50 13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	7·84	8·40	9·60	10·88	12·06 12·64	12·40	304 6
283	11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38 14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48	12·55	12·87	305 7
284	12·46 11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60 7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	306 9
285	12·30	10·26	8·61	7·37 6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04 5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	307 11
286	10·66	8·56	7·12	6·44	6·77	8·02 10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60 15·51	16·05	15·06	12·86	10·40	308 13
287	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84 15·03	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38 12·86	9·98	7·70	309 15
288	6·25	5·93	6·71	8·67	11·25	13·84	15·52	15·84	14·55	11·68	8·46 5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	310 16
289	6·32 6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03 7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	311 18
290	6·46	8·00	10·44 13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92 16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	312 20
291	9·00	11·24	13·43	14·50	14·36	12·66 9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34	15·71	13·92	11·46 9·28	7·66	6·86	6·98	7·98	9·96	313 22
292	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86 4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56 7·92	9·16	10·68	12·24	315 0
293	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52 12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18 12·58	316 2
294	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	14·18	14·40 13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	317 3
295	11·36	10·28 8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72	10·53	9·66 9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	318 5
296	10·20	9·26	8·46	8·10	8·14 8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04	8·80	8·85 9·16	9·64	10·14	10·74	11·18	11·32	11·06	319 7
297	10·38	9·58	8·94	8·71	8·90	9·50	10·42 11·46	12·48	13·10	13·15	12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86 11·50	11·80	11·55	10·96	320 9
298	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16 12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64 11·66	10·25	321 11
299	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	13·00	11·72	10·14 8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	322 12
300	8·76	7·98 7·96	8·75	10·13	11·64	13·14	13·94	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46 6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	323 14
301	7·27	7·36	8·22	9·82 11·76	13·33	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02 14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	324 16
302	6·78	8·22	10·37	12·25	13·88	14·74	14·20 12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76 10·86	8·17	6·45	5·84	6·36	325 18
303	8·12	10·44	12·84	14·46	15·08	13·97	11·41	8·07	4·96 2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65 5·46	6·44	8·40	326 20
304	11·20	13·57	15·11	15·17	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02 9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	327 21
305	12·22 14·44	15·50	14·80	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44 17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	328 23
306	14·67	15·26	14·06 11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68 8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	330 1
307	14·72	13·33	10·74	7·81	5·32	3·66 3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72 6·26	7·94	10·30	12·38	13·76	13·96	331 3
308	12·68	10·56	8·18	6·28	4·97	4·83	5·73	7·34 9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78 12·86	13·16	12·24	332 5
309	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	13·88	14·87 14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53 11·48	333 7
310	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30 10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08	12·42	334 8
311	11·25	9·75	8·54 7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72 5·86	6·88	8·64	10·40	12·07	13·31	13·88	13·62	12·36	335 10

312	10·67	9·06	8·12	7·90	8·54 9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50 10·56	12·60	14·12	14·40	13·86	12·58	10·80	336 12
313	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98 14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84 15·08	13·13	10·86	9·00	337 14
314	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28 8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	12·88	10·26	8·38 7·53	338 16
315	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05 5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	339 17
316	7·37	8·31 10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87 14·55	16·23	16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	340 19
317	9·02	10·97	12·94	14·40	14·70 13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11 12·72	10·27	8·26	7·37	7·26	8·12	9·82	341 21
318	11·91	13·58	14·48	14·07	12·12	9·32	6·72 4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80 7·24	7·44	8·72	10·57	12·55	342 23
319	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20 10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50 13·03	13·80	344 1
320	13·45	11·78	9·47	7·26	5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17 15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67	13·00	345 2
321	12·14 10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22 8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	346 4
322	9·47	8·01	6·87	6·45 6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73 8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	347 6
323	8·46	7·76	7·56	8·00	8·95	10·05 11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27 11·70	11·62	11·14	10·38	9·49	348 8
324	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79 13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57 10·96	10·14	9·44	349 10
325	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26 8·86	7·83	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	350 11
326	9·06 9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	6·15 6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	351 13
327	8·68	9·14	10·18 11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75	4·90	4·92	6·07	7·94	10·07 12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	352 15
328	8·23	9·70	11·40	12·74	13·42	13·45 12·54	10·80	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97 13·05	10·60	8·64	7·50	7·36	8·16	353 17
329	9·80	11·80	13·38	14·33	14·26	13·00	10·50	7·72 5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06 6·98	7·04	8·06	10·00	354 19
330	12·15	14·04	15·14	15·03	13·10	10·20	7·00	4·27	2·40	2·20	3·93 6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86 12·72	355 21
331	14·77	15·81	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30 17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10	356 22
332	15·24	16·17 14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51 10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	358 0
333	15·86	14·14	10·98	7·68	4·48 2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	17·88	16·62	13·58	9·97	6·94	5·14 4·70	5·52	7·63	10·73	13·70	15·36	15·32	359 2
334	13·24	9·92	6·64	4·73	3·07	3·08	4·74 6·97	9·86	13·01	15·80	17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	10·96 13·30	14·68	14·83	13·24	360 4
335	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58 16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	8·60	10·76	12·74	13·74	13·62 12·37	10·30	361 6
336	8·14	6·53	5·84	6·14	7·14	8·74	10·77	13·13	14·96	15·71	15·12	13·32 10·86	8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	362 7
337	9·22	7·96 7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82 5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	363 9
338	9·12	8·42	8·24	8·54 9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27 8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	364 11
339	9·06	8·58	8·66	9·44	10·68	11·96	12·92 13·14	12·66	11·54	10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68 13·81	12·94	11·57	10·28	9·14	365 13
340	8·62	8·63	9·20	10·44	11·66	12·53	12·92	12·58	11·64 9·77	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78 10·34	9·17	8·44	366 15
341	8·24	8·62	9·76	11·04	12·36	13·08	12·90	11·65	9·64	7·34	5·52	4·45 4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	367 16
342	8·26 8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55 11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	8·38	7·80	7·97	368 18
343	9·00	10·56	12·24 13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94 14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	369 20
344	11·36	13·14	14·17	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	772·43	769·90	752·24	727·62	704·70	702·99	694·10	670·79	681·10	706·39	705·04	734·50	745·73	745·38	775·50	772·30	776·06	759·07	739·00	773·61	760·90	761·94	764·52	751·51	No. of Days.
																									72ᵈ 7ʰ.
No.	74	74	73	73	72	73	73	71	71	73	72	73	72	71	73	72	73	72	70	73	72	72	72	71	17747·32

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(4\gamma - 5\sigma + \varpi)$. SERIES M_2N. Motion per mean Solar hour = $57°\cdot4238338$.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00 / 18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	16·66	2 0
2	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94 / 16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·10	6·10	8·63	11·84	14·68	16·63	16·96	3 1
3	15·24	11·93	8·00	4·87	2·80	2·57	4·24	6·84	10·20 / 14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	14·87	16·40	16·40	4 2
4	14·28	11·00	7·63	4·88	3·55	3·86	5·55 / 8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	12·28	14·51	15·96	15·58	5 3
5	13·48	10·47	7·54	5·76	5·07 / 5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18	9·67	12·12	14·04	15·00	14·45	6 4
6	12·62	10·24	8·07	7·04 / 6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76	11·80	13·27	14·00	13·64	7 5
7	12·22	10·47 / 9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87	11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	11·16	12·55	13·24	13·07 / 12·20	8 7
8	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	7·34	8·07	9·14	10·55	11·74 / 12·48	12·66	12·27	9 8
9	11·60	10·93	10·34	9·98	9·86	10·17	11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	8·96	10·26 / 11·64	12·67	13·14	12·97	10 9
10	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	7·28 / 8·73	10·47	12·14	13·23	13·84	13·63	11 10
11	12·58	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74 / 6·34	7·62	9·54	11·46	13·22	14·24	14·58	13·94	12 11
12	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62 / 5·56	6·50	8·14	10·17	12·34	14·10	15·20	15·17	13·97	13 12
13	12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66	7·32 / 5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	14 13
14	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	10·84 / 8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	15 14
15	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	12·44 / 9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	16 15
16	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68 / 13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	17 16
17	7·86	6·84	6·68	7·56	9·32	11·40	13·55 / 14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	18 17
18	6·76	6·12	6·34	7·60	9·84 / 12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	19 18
19	5·80	5·43	6·26	8·16 / 10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	20 19
20	5·54	5·64 / 6·83	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70	6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17 / 5·70	21 21
21	6·11	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34 / 6·17	6·00	22 22
22	6·68	8·02	9·76	11·65	13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76 / 8·71	6·96	6·23	6·09	23 23
23	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60 / 12·06	10·26	8·46	7·10	6·25	6·08	25 0
24	6·56	7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38 / 13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	26 1
25	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87 / 12·94	13·44	13·33	12·40	10·74	8·86	6·83	5·22	4·41	27 2
26	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25 / 9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	28 3
27	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83	7·24 / 6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	8·82	5·70	3·60	2·56	29 4
28	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	8·07 / 6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16	30 5
29	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80 / 10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	31 6
30	4·00	6·66	10·10	13·98	17·01	18·64	18·38 / 16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	32 7
31	4·86	7·74	11·40	14·94	17·54 / 18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	33 8
32	6·36	9·36	12·84	15·86 / 17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	34 9
33	8·06	10·66 / 13·66	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04 / 9·56	35 11
34	11·76	14·24	15·60	16·04	15·34	13·02	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30 / 9·05	10·36	36 12
35	12·08	13·76	14·66	14·44	13·11	11·12	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12 / 9·06	9·26	9·66	10·60	37 13

36	11·82	12·86	13·34	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84 10·34	10·07	9·97	9·77	9·94	10·44	38 14
37	11·32	12·06	12·26	11·78	10·88	9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85 11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	39 15
38	10·80	11·27	11·45	11·25	10·76	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76 12·34	12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	40 16
39	10·24	10·94	11·36	11·44	10·97	10·10	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16 11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	41 17
40	9·76	10·58	11·25	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82	6·94 8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	42 18
41	10·24	11·52	12·40	12·66	12·07	10·47	8·56	6·64	5·46	5·20	5·93 7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	43 19
42	11·03	12·66	13·62	13·60	12·30	10·24	7·77	5·88	4·84 4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	44 20
43	11·85	13·60	14·38	13·88	11·93	9·10	6·54 4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	45 21
44	13·07	14·56	14·85	13·63	10·90	7·86 5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	46 22
45	14·42	15·50	15·15	13·08 9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	47 23
46	15·12	15·66 14·46	11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06 15·54	49 1
47	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44 14·55	15·46	50 2
48	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87 10·40	12·80	14·50	15·06	51 3
49	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06 6·46	8·24	10·33	12·41	13·86	14·34	52 4
50	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92 5·44	6·63	8·23	10·14	11·77	12·96	13·40	53 5
51	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98 5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	54 6
52	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50 8·90	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	55 7
53	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44 12·26	11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	56 8
54	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40 13·36	13·52	12·60	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	57 9
55	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03	8·83 11·00	12·96	14·40	14·74	13·76	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76	58 10
56	17·15	15·84	12·87	9·66	7·00	5·18	5·12 6·26	8·52	11·16	13·67	15·38	15·86	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58	13·16	16·04	17·62	59 11
57	17·34	15·27	11·66	8·27	5·56	4·16 4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66	11·26	7·66	4·94	3·20	3·27	4·70	7·52	10·86	14·63	17·06	17·98	60 12
58	16·96	13·90	10·20	6·96 4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	13·86	10·44	6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	61 13
59	15·46	12·03 8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76	15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40 13·86	62 15
60	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18 14·88	12·00	63 16
61	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42 15·27	14·71	12·72	10·14	64 17
62	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34 12·96	14·04	14·24	13·22	11·36	9·36	65 18
63	7·36	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46 11·36	12·44	13·07	13·03	12·12	10·46	8·86	66 19
64	7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24 10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	67 20
65	7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87 10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	68 21
66	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08	12·36	12·27	12·03 11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	69 22
67	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10 12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	70 23
68	8·84	7·56	6·74	6·70	7·63	8·94	10·62	12·06	13·26 13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	9·92	72 0
69	8·17	6·67	5·98	6·16	7·20	8·87	10·76 12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	73 1
70	7·27	5·74	5·30	5·90	7·44	9·66 11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	74 2
71	6·26	5·16	5·12	6·24 8·10	10·63	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	75 3
Sum	744·07	765·35	682·18	726·53	707·72	711·87	782·04	755·36	851·08	818·28	852·20	849·37	751·23	762·11	689·39	723·23	709·47	707·52	763·62	739·34	817·79	790·47	821·84	818·68	No. of Days. 74^d 4^h.
No.	71	76	71	77	74	74	77	71	77	72	76	77	71	76	71	76	74	73	76	71	76	72	75	76	18340·74

FORMS FOR SHORT-PERIOD TIDES.

Series M_2N.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
72	5·44	4·44 4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	76 4
73	4·92 4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73 6·13	4·66	77 6
74	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26 10·83	8·00	5·75	5·11	78 7
75	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74 15·74	13·36	10·24	7·64	6·12	6·08	79 8
76	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62 16·12	14·97	12·74	10·02	8·05	6·96	7·06	80 9
77	7·93	9·67	12·07	14·08	15·23	15·08	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88 13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	81 10
78	9·06	10·62	12·40	13·77	14·52	14·20	12·80	10·64	8·47	6·76	5·86	5·82	6·49	7·75 9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	82 11
79	9·12	10·24	11·76	13·06	13·60	13·34	12·06	10·56	8·92	7·40	6·43	6·30	6·68 7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	83 12
80	9·04	9·84	10·96	12·05	12·86	12·96	12·44	11·22	9·67	8·30	7·06 6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	84 13
81	7·96	8·44	9·76	11·26	12·36	12·92	12·78	11·94	10·50 8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	85 14
82	6·56	7·46	9·22	11·16	12·56	13·57	14·06 13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97	5·74	86 15
83	5·63	6·67	8·88	11·24	13·46	14·86 15·36	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	87 16
84	4·80	6·40	9·20	12·06 14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	88 17
85	4·70	6·72 9·92	13·20	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	89 18
86	5·24 7·57	11·00	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83 4·41	6·43	90 20
87	8·78	12·04	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84 4·04	3·84	4·93	7·24	91 21
88	10·09	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87 7·14	5·16	4·22	4·76	6·40	8·73	92 22
89	11·37	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34 8·76	6·67	5·40	5·22	6·16	7·85	9·97	93 23
90	12·30	14·30	15·48	15·46	14·27	12·24	10·20	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84 12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	95 0
91	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80 12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	96 1
92	12·34	13·52	13·80	13·26	12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44 11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	97 2
93	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02 10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	98 3
94	11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47 9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70	10·66	99 4
95	11·77	12·66	13·06	12·94	12·40	11·47	10·50 9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84	7·76	8·43	9·46	10·86	100 5
96	12·30	13·36	13·82	13·66	12·66	11·42 10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	101 6
97	12·70	14·06	14·56	14·22 12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	102 7
98	13·58	14·86 15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	103 8
99	14·55 15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70 13·40	15·52	104 10
100	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52 8·91	11·80	14·40	15·97	105 11
101	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57 7·24	10·07	13·10	15·40	16·44	106 12
102	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15 5·71	6·50	8·36	11·33	14·12	15·97	16·50	107 13
103	15·10	12·22	8·67	5·24	3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32 7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	108 14
104	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60 13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	109 15
105	12·53	9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74 14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	110 16
106	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87 14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	111 17

107	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72 11·62	13·34	14·34	14·44	13·66	12·26	10·62	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	112 18
108	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94 9·57	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96	7·85	9·40	10·96	12·36	13·06	113 19
109	13·12	12·22	10·65	8·87	7·52	6·74 6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	13·72	114 20
110	13·87	12·97	11·36	9·32 7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54	12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	115 21
111	14·94	13·86 11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	116 22
112	15·54 14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96	14·10	15·48	15·44	13·84	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14 16·26	15·76	118 0
113	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42 14·32	16·17	16·57	15·46	119 1
114	12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	15·07	15·35	13·81	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52 12·56	14·92	16·36	16·28	14·70	120 2
115	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68 8·27	10·68	13·46	15·48	16·25	15·62	13·50	121 3
116	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	10·82	7·87	5·57	3·94	3·86 4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	122 4
117	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	11·90	9·20	6·72	5·07 4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76	13·04	10·84	123 5
118	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	10·40	8·28	6·46 5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14	124 6
119	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	11·36	9·58 7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	125 7
120	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68 10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94	126 8
121	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44 11·34	10·58	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24	13·54	13·24	12·12	10·96	9·98	127 9
122	9·27	8·94	8·74	8·80	9·24	10·03 10·80	11·26	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	128 10
123	8·96	8·20	7·92	8·00 8·62	9·56	10·46	11·34	11·77	11·44	10·76	9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	129 11
124	8·30	7·26 6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	130 12
125	7·34 6·24	5·98	6·71	8·26	10·20	12·12	13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97 7·60	5·85	131 14
126	4·92	5·06	6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10 11·76	8·83	6·14	4·18	132 15
127	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47 13·76	10·66	7·20	4·46	2·86	133 16
128	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02 15·97	15·24	12·56	8·86	5·70	3·17	1·97	134 17
129	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90 13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	135 18
130	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20 11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	136 19
131	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60 6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88	137 20
132	4·46	6·78	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36 6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	138 21
133	5·66	7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94 9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	139 22
134	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00 11·78	9·46	7·72	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	140 23
135	7·26	8·54	10·38	12·48	14·22	14·94 14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	142 0
136	7·36	8·54	10·16	11·86 13·27	14·14	13·98	12·92	11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	143 1
137	7·70	8·44	10·00 11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	144 2
138	7·63 8·26	9·76	11·56	13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16 7·52	7·50	145 4
139	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12 9·16	7·84	7·36	7·72	146 5
140	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94 10·67	8·77	7·60	7·38	7·93	147 6
141	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70 14·12	12·14	9·74	8·36	7·64	7·54	8·20	148 7
142	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42 16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74	8·92	149 8
Sum	723·70	742·55	743·25	828·93	802·15	869·38	821·74	798·11	771·06	676·94	696·88	642·33	700·96	726·46	736·65	837·64	800·17	881·37	821·07	808·08	786·27	690·16	721·72	661·34	No. of Days. 74d 5h
No.	77	76	72	76	71	76	73	74	76	71	76	71	76	75	72	77	71	77	73	75	77	71	77	71	18288·91

FORMS FOR SHORT-PERIOD TIDES.

Series M_2N.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
143	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66 15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	150 9
144	11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00 13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	151 10
145	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60 9·46	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	152 11
146	12·62	13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56 6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78	8·46	9·92	11·36	153 12
147	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94 6·87	8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	8·38	8·08	8·30	9·20	10·24	11·40	154 13
148	12·12	12·46	11·72	10·38	8·77	7·37 6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	155 14
149	11·83	12·05	11·56	10·60 9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	156 15
150	11·70	11·97	11·72 11·06	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·29	157 16
151	12·14 12·58	12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67	9·96 11·54	12·84	158 18
152	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19 9·46	11·28	13·22	14·76	159 19
153	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	12·02	9·86	8·00	7·09	6·85 7·72	9·34	11·40	13·77	15·84	160 20
154	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	13·50	10·84	8·22	6·16 4·95	5·15	6·50	8·61	11·37	14·18	16·48	161 21
155	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	12·77	9·46 6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	162 22
156	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	14·76	11·87 8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	163 23
157	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14 14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	165 0
158	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79	15·16 16·42	15·96	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	166 1
159	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80 15·12	16·05	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	167 2
160	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41 10·07	13·02	14·92	15·57	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	168 3
161	16·60	14·54	11·30	8·66	6·74	6·05 6·16	7·65	10·05	12·50	14·32	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	169 4
162	15·74	13·76	10·84	8·61 6·86	6·32	6·58	7·80	9·82	12·04	13·55	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	170 5
163	14·58	12·66	10·40 8·31	7·04	6·60	6·77	7·78	9·32	11·22	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	14·75	171 6
164	13·73 12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	13·24	14·06 14·10	13·34	172 8
165	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90 13·82	13·85	13·08	173 9
166	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08 11·26	12·44	13·30	13·52	12·80	174 10
167	11·00	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90	9·46	8·62	8·24 8·56	9·64	11·12	12·55	13·40	13·37	12·07	175 11
168	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77	12·06	10·27	8·84 8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	176 12
169	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56	15·33	14·70	13·32	11·14	9·44 8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	177 13
170	7·97	5·83	4·38	4·04	4·96	6·82	9·02	11·57	13·86	15·24	15·44	14·56	12·56 10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	178 14
171	6·93	4·96	3·94	4·22	5·70	7·84	10·40	12·82	14·74	15·56	15·33 13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	179 15
172	5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12	15·46 14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	180 16
173	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31 15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	181 17
174	4·72	4·42	5·32	6·94	8·97	11·17 13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	182 18
175	5·02	5·24	6·42	8·07 10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	183 19
176	5·87	6·54	7·66 9·24	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96	184 20
177	6·92 7·56	8·50	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48 7·63	7·56	185 22

178	8·14	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38 9·16	8·34	8·14	186 23
179	8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86 12·14	11·14	9·86	8·86	8·32	188 0
180	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	6·86	8·67	10·62	12·30 13·47	13·96	13·31	12·10	10·48	9·04	8·28	189 1
181	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62 10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	190 2
182	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	7·76	5·44	3·88	3·19	3·88	5·80 8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	191 3
183	6·90	7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27 3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	192 4
184	6·04	7·17	9·30	11·84	13·92	15·05	14·90	13·08	9·91	6·43	3·53 1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24	193 5
185	5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65 2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	8·47	5·86	4·66	194 6
186	4·98	6·66	9·72	13·12	15·46	16·44	15·54	12·76 8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	7·30	5·12	4·24	195 7
187	4·66	6·66	9·96	13·24	15·56	16·37 15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	196 8
188	5·04	7·14	10·42	13·85	15·77 16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	9·26	6·86	5·22	4·84	197 9
189	5·76	8·06	10·85 13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	198 10
190	6·24 8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92 6·05	6·82	199 12
191	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	13·78	14·07	13·40	11·92	10·10	8·37	6·87 6·38	6·51	7·24	200 13
192	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	11·34	9·77 8·47	7·34	6·76	6·86	7·36	201 14
193	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50 11·42	10·20	8·76	7·52	6·90	6·76	7·25	202 15
194	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94 12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	203 16
195	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74	9·52	8·94	8·94	9·48	10·50	11·72 12·63	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	204 17
196	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16 10·36	11·74	13·14	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	205 18
197	9·76	12·02	14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18 8·73	9·62	10·95	12·64	13·76	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	206 19
198	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04 8·20	8·78	9·99	11·82	13·73	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78	7·22	9·33	207 20
199	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67 7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	208 21
200	13·14	15·37	16·51	16·11	14·47	11·94 9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	14·90	14·32	12·37	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	209 22
201	14·36	15·96	16·14	15·17	12·96 10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	210 23
202	15·27	16·14	15·82 14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	212 0
203	15·50 15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64 14·44	15·55	213 2
204	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37 13·15	14·57	15·10	214 3
205	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86 10·16	11·76	13·33	14·29	14·38	215 4
206	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47	10·24	9·16	8·76 9·04	9·66	10·72	12·02	13·24	14·10	14·04	216 5
207	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14	13·55	13·28	12·50	11·34	10·26 9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	217 6
208	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50	10·20	11·94	13·44	14·14	14·16	13·42 12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	218 7
209	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46	8·25	10·24	12·44	14·18	15·26 15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	219 8
210	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02 15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	220 9
211	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44 13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85	8·10	10·22	12·92	15·15	16·26	221 10
212	15·72	13·66	10·33	6·96	4·40	3·04	3·33	5·32 7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	222 11
213	16·38	13·96	10·25	6·47	3·74	2·56 3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60	7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	17·16	223 12
Sum	850·16	794·49	834·07	773·34	740·77	738·25	669·89	729·18	702·16	784·95	833·44	798·44	878·60	805·26	847·29	775·60	741·31	743·97	687·88	742·40	719·35	778·12	816·92	788·45	No. of Days. 74d 4h.
No.	76	71	76	74	73	77	71	77	72	76	77	71	77	71	77	74	73	76	71	76	72	75	76	71	18574·29

FORMS FOR SHORT-PERIOD TIDES.

SERIES M_2N.—(*Continued*).

Day	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
214	16·04	13·12	9·20	5·80	3·36 2·56	3·60	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	224 13
215	15·39	12·15	8·23 5·44	3·52	3·32	4·58	7·04	10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	225 14
216	14·38 11·26	7·98	5·62	4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	15·18 13·36	226 16
217	10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60 14·46	13·96	12·48	227 17
218	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14 12·02	13·26	13·57	12·85	11·76	228 18
219	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	7·00	7·70 8·77	10·10	11·44	12·33	12·66	12·46	12·00	229 19
220	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69 8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34	230 20
221	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35 7·66	7·57	8·12	9·06	10·48	11·57	12·72	13·42	13·56	13·18	231 21
222	12·30	11·45	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36 9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43	12·72	13·64	13·66	13·26	232 22
223	12·36	11·22	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85 10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	233 23
224	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	13·30 13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	235 0
225	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56 13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	236 1
226	10·57	8·64	7·46	7·31	7·76	8·84 10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	237 2
227	8·97	7·34	6·70	6·84	7·80 9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	10·11	238 3
228	7·72	6·36	6·10 6·94	8·63	10·83	13·20	15·21	15·71	14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	8·34	239 4
229	6·35 5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	9·60	7·06 5·50	240 6
230	5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04 8·16	6·11	5·05	241 7
231	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77 12·44	9·37	7·06	5·37	4·85	242 8
232	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24 15·10	13·64	11·26	8·61	6·50	5·32	5·38	243 9
233	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73 14·44	13·86	12·25	10·02	8·06	6·46	5·62	5·78	244 10
234	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67 11·96	13·06	13·46	13·08	11·68	9·86	8·26	6·87	6·17	6·26	245 11
235	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18 9·63	10·54	11·48	12·46	12·92	12·66	11·74	10·42	8·87	7·44	6·44	6·21	246 12
236	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22 8·90	9·14	9·86	10·86	12·02	12·84	12·98	12·36	11·16	9·57	7·60	6·24	5·63	247 13
237	5·97	7·17	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85 10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	13·40	12·04	10·04	7·64	5·76	4·78	248 14
238	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74 14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	14·86	14·44	12·80	10·18	7·37	5·17	3·90	249 15
239	4·03	5·50	7·96	10·88	13·80	16·04 17·04	16·46	14·44	11·04	8·24	6·27	5·15	5·63	7·24	9·64	12·52	14·74	15·98	15·46	13·29	9·94	6·63	4·34	3·17	250 16
240	2·53	5·38	8·20	11·40	14·56 16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	251 17
241	3·72	5·66	8·70 12·20	15·53	17·33	17·53	15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	252 18
242	4·46 6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	11·54	8·00	5·38	3·90	4·20 5·52	253 20
243	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	10·56	7·46	5·47 4·87	5·60	7·04	254 21
244	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92	12·66	9·98 7·74	6·47	6·36	7·02	8·54	255 22
245	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	13·56	14·79	14·77	13·46	11·46 9·44	8·00	7·36	7·56	8·36	9·51	256 23
246	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36	11·36	13·14	13·88	13·60 12·43	10·94	9·64	8·76	8·44	8·70	9·18	9·95	258 0
247	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	11·16	12·22 12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	259 1
248	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84 10·90	11·62	11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	260 2

249	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44 9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	261	3
250	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42 7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	262	4
251	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36 7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	263	5
252	9·92	11·30	12·38	12·82	12·42	11·17	9·62 7·86	6·55	6·10	6·54	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	264	6
253	10·20	11·92	13·16	13·44	12·50 10·70	8·70	6·90	5·75	5·50	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	265	7
254	11·07	13·02	14·14 14·04	12·68	10·30	7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	266	8
255	12·54 14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24 13·97	267	10
256	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93 9·67	12·77	15·34	268	11
257	16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83 5·50	7·97	11·14	14·16	16·01	269	12
258	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67 4·60	6·44	9·03	12·27	14·84	16·21	270	13
259	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65	5·42 3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	271	14
260	15·16	13·24	10·76	8·47	7·04	6·68	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24 7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	272	15
261	14·13	12·37	10·44	8·86	7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81 10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	273	16
262	13·68	12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08 11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	274	17
263	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30 12·30	12·61	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	275	18
264	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94 9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	276	19
265	14·66	14·52	13·27	11·34	9·06	7·37	6·82 7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	277	20
266	15·99	15·54	13·97	11·26	8·63 6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	278	21
267	16·98	16·37	13·80 10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	279	22
268	17·15	15·62 12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	13·66	16·26	17·40 16·86	281	0
269	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62 16·82	17·12	15·72	282	1
270	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44	6·06	7·47	10·01 12·74	15·12	16·37	16·06	14·21	283	2
271	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53 10·52	13·06	15·02	15·64	14·36	11·93	284	3
272	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13	9·47	7·47	6·58	6·90 7·84	9·30	11·26	13·26	14·41	14·26	12·74	10·35	285	4
273	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80 7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	11·36	9·07	286	5
274	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16 8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	10·00	8·37	287	6
275	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06 10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	10·73	9·52	8·47	288	7
276	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66 11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	10·30	9·78	9·22	289	8
277	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02 12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	10·88	10·82	10·57	10·03	290	9
278	9·26	8·44	7·90	8·07	8·80	9·84	10·90 11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	11·53	10·67	291	10
279	9·30	8·14	7·56	7·77	8·55 9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	12·06	10·48	292	11
280	8·86	7·70	7·28 7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	12·48	10·52	293	12
281	8·76	7·36 6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	12·26	9·96 7·92	294	14
282	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84	15·96	14·52 12·00	9·24	7·24	295	15
283	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15	13·10	15·67	16·78 16·26	14·16	11·00	8·32	6·36	296	16
284	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	14·60	16·81 17·35	16·28	13·64	10·44	7·71	6·07	297	17
Sum	763·22	723·28	742·65	684·37	754·49	750·38	774·90	824·95	783·66	842·03	772·06	801·67	761·64	701·25	721·91	672·12	732·60	733·30	777·03	824·70	772·57	841·55	763·68	804·51	No. of Days.	
																									$74^d\ 5^h$.	
No.	75	73	77	71	77	73	74	76	71	76	71	76	75	72	76	71	76	73	75	77	71	77	71	77	18324·52	

FORMS FOR SHORT-PERIOD TIDES.

SERIES M_2N.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
285	5·84	6·88	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46	3·46	2·87	4·17	6·35	9·32	13·00 15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	298 18
286	6·04	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47 10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	299 19
287	6·28	7·70	9·92	12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55 8·04	11·05	14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	6·57	300 20
288	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22 5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	301 21
289	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84 5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	302 22
290	7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75 9·22	7·66	6·68	6·30	6·72	7·86	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	7·93	303 23
291	7·84	8·40	9·60	10·88	12·06	12·64	12·40 11·47	10·10	8·76	7·68	7·01	7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	305 0
292	7·02	7·48	8·84	10·32	11·48 12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	6·30	306 1
293	5·88	6·50	8·20 10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	307 2
294	5·04	5·86 7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22 4·10	308 4
295	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04 4·71	3·46	3·86	309 5
296	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84	15·52	15·84	14·55	11·68	8·46 5·64	3·63	3·01	4·08	310 6
297	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46	9·60	12·20	14·35	15·67	15·28	13·15 10·15	7·00	4·47	3·03	3·22	5·03	311 7
298	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87	6·16	6·46	8·00	10·44	13·10	14·76	15·16 13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	312 8
299	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43 14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	313 9
300	10·56	13·46	15·64	16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00 13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	314 10
301	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16 10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52	315 11
302	12·80	14·44	15·16	14·68	13·32	11·56	10·02	8·76	8·10	8·00 8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	316 12
303	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46 8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	317 13
304	12·86	13·86	13·83	12·96	11·72	10·53	9·66 9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	318 14
305	12·76	13·34	13·26	12·61	11·72 10·86	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	319 15
306	12·48	13·10	13·15 12·64	11·84	10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	320 16
307	12·41	13·07 13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	10·02	11·20 12·46	321 18
308	13·23	13·47	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75 10·13	11·64	13·14	322 19
309	13·94	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36 8·22	9·82	11·76	13·33	323 20
310	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02 6·40	6·78	8·22	10·37	12·25	13·88	324 21
311	14·74	14·20	12·26	9·36	6·51	4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86 8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	325 22
312	15·08	13·97	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75 12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	326 23
313	15·17	13·27	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25 15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	328 0
314	14·80	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44 17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06	12·76	14·67	15·26	329 1
315	14·06	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23 14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	14·72	330 2
316	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86 11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	331 3
317	12·68	10·56	8·18	6·28	4·97	4·83	5·73 7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	332 4
318	12·24	10·73	8·96	7·30	6·24 5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	333 5
319	12·53	11·48	10·14 8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	334 6

320	13·08	13·42 11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	12·07	13·31 13·88	335 8
321	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	10·56 12·60	14·12	14·40	336 9
322	13·86	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66 11·20	13·52	15·24	15·84	337 10
323	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07 6·97	9·54	12·26	14·54	16·11	16·34	338 11
324	15·17	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87 4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	339 12
325	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31 3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	340 13
326	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77 5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48	15·11	341 14
327	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12 9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07	15·87	16·56	15·80	13·96	342 15
328	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24 13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	10·34	12·88	15·05	16·23	16·28	14·89	12·63	343 16
329	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80 13·45	11·78	9·47	7·26	5·64	5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	344 17
330	9·46	7·98	7·36	7·62	8·50	10·02	11·60 12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	345 18
331	8·66	7·73	7·38	7·80	8·82 10·22	11·48	12·26	12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	346 19
332	8·40	7·76	7·73	8·27 9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	347 20
333	8·76	8·24 8·24	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17 8·30	348 22
334	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55 10·26	8·86	7·83	349 23
335	7·22	7·36	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55	10·76	11·97	12·94	13·38	13·14	12·44 11·22	9·78	8·36	7·04	351 0
336	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	8·68	9·14	10·18	11·57	12·76	13·30 13·22	12·46	11·00	9·17	7·18	5·75	352 1
337	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40 12·74	13·42	13·45	12·54	10·80	8·50	6·30	4·47	353 2
338	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80 11·80	13·38	14·33	14·26	13·00	10·50	7·72	5·17	3·42	354 3
339	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04 8·06	10·00	12·15	14·04	15·14	15·03	13·10	10·20	7·00	4·27	2·40	355 4
340	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27 6·14	6·36	7·56	9·86	12·72	14·77	15·81	15·20	12·64	9·26	5·91	3·10	1·55	356 5
341	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00 8·88	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	14·94	12·16	8·55	5·06	2·64	1·50	357 6
342	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51 10·92	7·77	5·66	5·14	5·64	7·65	10·63	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	358 7
343	3·30	5·83	8·90	12·30	15·56	17·50	17·88 16·62	13·58	9·97	6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	359 8
344	4·74	6·97	9·86	13·01	15·80 17·38	17·48	15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	360 9
345	5·97	8·02	10·57	13·25 15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	361 10
346	7·14	8·74 10·77	13·13	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28 7·93	362 12
347	9·16	10·97	13·12	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12 8·42	8·24	8·54	363 13
348	9·54	11·12	12·64	13·57	13·57	12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26 10·02	9·06	8·58	8·66	364 14
349	9·44	10·68	11·96	12·92	13·14	12·66	11·54	10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81 12·94	11·57	10·28	9·14	8·62	8·63	365 15
350	9·20	10·44	11·66	12·53	12·92	12·58	11·64	9·77	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23 14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24	366 16
351	8·62	9·76	11·04	12·36	13·08	12·90	11·65	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43 14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	367 17
352	8·96	10·32	11·70	12·96	13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55 11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	8·38	7·80	7·97	368 18
353	9·00	10·56	12·24	13·46	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34 7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	369 19
354	9·38	11·36	13·14	14·17	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	668·13	745·51	761·14	785·39	841·04	787·50	825·43	734·66	729·26	698·87	625·63	678·61	641·45	733·82	754·99	785·06	850·23	784·20	813·57	727·10	738·31	709·48	647·33	693·33	No. of Days. 72d 9h.
No.	70	75	73	72	75	70	75	70	73	74	69	75	69	75	72	72	75	69	74	69	74	74	69	74	17760·04

FORMS FOR SHORT-PERIOD TIDES.

Bombay—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(3\gamma - 2\sigma)$. Series M_2K_1. Motion per mean Solar hour = 44°·0251728.

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	12·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50	18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06 16·66	2 0
2	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56	8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	16·63	3 0
3	16·96	15·24	11·92	8·00	4·87	2·80	2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16 8·86	12·14	14·87	16·40	4 1
4	16·40	14·28	11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·36	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	12·28	14·51	5 1
5	15·96	15·58	13·48	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16 6·22	5·47	5·84	7·18	9·67	12·12	14·04	6 2
6	15·00	14·45	12·62	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64	6·17	6·55	7·86	9·76	11·80	7 2
7	13·27	14·00	13·64	12·22	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18 13·87	11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	11·16	8 3
8	12·55	13·24	13·07	12·20	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02	14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	7·34	8·07	9·14	9 3
9	10·55	11·74	12·48	12·66	12·27	11·60	10·93	10·34	9·98	9·86	10·17	11·07 12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	8·96	10 4
10	10·26	11·64	12·67	13·14	12·97	12·20	11·24	10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	7·28	11 4
11	8·73	10·47	12·14	13·23	13·84	13·63	12·58	11·38	10·27 9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	7·62	12 5
12	9·54	11·46	13·22	14·24	14·58	13·94	12·72	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62	5·56	6·50	13 5
13	8·14	10·17	12·34	14·10	15·20	15·17	13·97 12·27	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66	7·32	5·82	5·14	5·44	6·74	14 6
14	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00	10·84	8·24	6·20	4·76	4·46	5·40	15 6
15	7·36	9·78	12·57	14·82 16·13	15·97	14·56	12·25	10·05	8·46	7·82	7·74	8·41	9·71	11·76	13·30	14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	16 7
16	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	7·54	6·94	7·15	8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	17 7
17	7·26 9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86	6·84	6·68	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48	5·34	4·30	4·66	6·25	18 8
18	8·54	11·38	14·15	16·15	16·88	16·08	14·04	11·02	8·54	6·76	6·12	6·34	7·60	9·84	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67 4·24	5·16	7·15	19 9
19	9·68	12·56	14·87	16·44	16·45	15·00	12·42	9·50	7·22	5·80	5·43	6·26	8·16	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	20 9
20	8·66	11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	6·83	8·93	11·40	13·32	14·42	14·25	12·47 10·10	7·91	6·34	5·70	6·30	7·70	21 10
21	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94	8·32	7·22	7·01	7·74	22 10
22	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	8·02	9·76	11·65 13·04	13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	23 11
23	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	6·68	7·86	9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	24 11
24	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25	6·08	6·56 7·64	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	25 12
25	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24	8·47	7·00	5·83	5·38	5·68	6·78	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	26 12
26	9·11	8·87	9·40	10·46	11·87	12·94	13·44	13·33	12·40	10·74	8·86 6·83	5·22	4·41	4·77	6·10	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	27 13
27	8·28	7·92	8·25	9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	28 13
28	8·83	7·24	6·86	7·53	9·20	11·11	12·97	14·55 15·08	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	7·88	11·48	14·56	17·04	17·86	17·00	14·36	10·96	29 14
29	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	8·75	12·46	16·01	18·10	18·47	17·26	13·80	30 14
30	10·14	7·09	5·27	5·02	6·02 8·40	11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00	6·66	10·10	13·98	17·01	18·64	18·38	16·30	12·42	31 15
31	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	16·86	14·76	11·06	7·36	4·34	2·72	2·99	4·86	7·74	11·40	14·94	17·54	18·47	17·66	14·67	32 15
32	11·08	7·54 5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08	13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	15·86	17·74	17·94	16·48	13·27	33 16
33	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70	15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	16·02	17·12	16·74 14·88	11·68	34 17
34	8·76	6·34	4·92	4·74	5·86	8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	15·60	16·04	15·34	13·02	35 17
35	10·16	7·86	6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08 13·76	14·66	14·44	13·11	11·12	36 18

36	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86	13·34	12·82	11·45	37 18
37	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77 9·94	10·44	11·32	12·06	12·26	11·78	10·88	38 19
38	9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12	10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	11·25	39 19
39	10·76	9·97	9·00	8·00	7·11	6·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34	12·55	12·30 11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	11·44	40 20
40	10·97	10·10	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16	11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	41 20
41	11·66	11·34	10·36	8·82	7·36	6·12	5·54	5·82	6·94	8·54	10·36	12·06 13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	42 21
42	12·66	12·07	10·47	8·56	6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	43 21
43	13·62	13·60	12·30	10·24	7·77	5·88	4·84	4·96	6·33 8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87	11·85	13·60	44 22
44	14·38	13·88	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96	6·74	8·48	10·85	13·07	45 22
45	14·56	14·85	13·63	10·90	7·86	5·57 4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00	6·17	5·46	5·74	7·26	9·70	12·25	14·42	46 23
46	15·50	15·15	13·08	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00	11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	47 23
47	15·12	15·66	14·46 11·76	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68	15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	49 0
48	15·54	15·51	13·57	10·53	7·47	5·38	4·52	5·04	6·70	9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	50 0
49	14·55 15·46	14·76	12·57	9·68	7·24	5·84	5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	10·40	12·80	51 1
50	14·50	15·06	14·03	11·86	9·36	7·58	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06	6·46 8·24	10·33	12·41	52 2
51	13·86	14·34	13·44	11·46	9·53	8·05	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92	5·44	6·63	8·23	10·14	53 2
52	11·77	12·96	13·40	12·76	11·56	10·24	9·04	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98 5·77	5·38	5·64	6·37	7·82	9·54	54 3
53	11·17	12·38	13·02	12·96	12·16	11·07	10·02	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70	10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	55 3
54	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	8·88	8·08	7·87	8·42	9·56	10·87	11·93	12·44 12·26	11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	56 4
55	8·52	10·67	12·72	14·44	14·86	14·44	12·70	10·66	8·80	7·60	7·21	7·64	9·18	11·00	12·40	13·36	13·52	12·60	10·86	8·63	6·40	4·63	4·06	4·70	57 4
56	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96	10·26	7·95	6·54	6·18	7·03 8·83	11·00	12·96	14·40	14·74	13·76	11·70	8·84	6·08	4·05	3·42	4·14	58 5
57	6·18	8·80	12·06	14·93	16·76	17·15	15·84	12·87	9·66	7·00	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	14·57	11·93	8·26	5·48	3·42	2·92	59 5
58	4·14	6·52	9·58	13·16	16·04	17·62	17·34	15·27	11·66	8·27 5·56	4·16	4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66	11·26	7·66	4·94	3·20	3·27	60 6
59	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	13·86	10·44	6·92	4·54	3·37	61 6
60	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46 12·03	8·50	5·70	3·74	3·27	4·33	7·10	10·34	13·76	15·97	16·76	15·76	12·96	9·44	6·74	4·67	4·23	62 7
61	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	3·86	5·60	8·27	11·55	14·34	16·02	16·28	14·66	11·66	8·60	6·46	5·26	63 7
62	5·46	6·56	8·86	11·44	14·36 15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06	4·86	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	64 8
63	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72	5·93	4·86	5·00	6·10	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	65 8
64	7·56	8·42 9·82	11·34	12·96	14·04	14·24	13·22	11·36	9·36	7·56	6·27	5·84	6·34	7·46	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	66 9
65	9·27	9·77	10·46	11·36	12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66 10·24	10·16	67 10
66	10·24	10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26	10·87	68 10
67	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	9·30	10·46	11·44	12·08 12·36	12·27	12·03	11·50	10·78	69 11
68	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	8·97	10·32	11·56	12·46	13·04	13·10	12·54	11·68	70 11
69	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	6·74	6·70	7·63 8·94	10·62	12·06	13·26	13·78	13·68	12·86	11·34	71 12
70	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	9·92	8·17	6·67	5·98	6·16	7·20	8·87	10·76	12·70	14·08	14·61	14·06	12·53	72 12
71	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97	13·54	13·03	11·46	9·42	7·27	5·74 5·30	5·90	7·44	9·66	11·92	14·02	15·17	15·16	13·87	11·66	73 13
72	9·44	7·56	6·34	6·07	6·86	8·68	10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	6·24	8·10	10·63	13·22	15·15	15·86	15·17	13·22	74 13
73	10·40	7·86	6·06	5·25	5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39 10·64	7·57	5·44	4·44	4·96	6·46	8·94	11·85	14·34	16·00	16·06	14·53	11·64	75 14
Sum	781·78	788·51	791·85	794·77	802·45	781·40	778·77	778·84	753·27	736·84	738·25	771·75	755·63	771·53	804·07	797·63	779·55	779·09	762·37	752·86	724·38	729·05	751·20	749·56	No. of Days.
No.	75	75	74	74	75	74	74	75	75	74	74	76	74	74	76	75	74	75	75	75	74	75	75	74	74d 15h. 18455·40

FORMS FOR SHORT-PERIOD TIDES.

Series M_2K_1.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
74	8·54	5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	15·75	16·73	16·07	13·66	76 14
75	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30 16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86	14·66	16·40	16·56	15·07	11·90	77 15
76	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88	7·84	10·46	13·38	15·68	16·60	15·80	13·36	78 15
77	10·12	7·06	4·83	3·54	3·76	5·34 7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24	7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	14·76	12·06	79 16
78	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12	14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	13·57	80 16
79	11·16	8·26	6·08 4·70	4·47	5·46	7·26	9·48	11·88	13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	12·80	81 17
80	10·64	8·47	6·76	5·86	5·82	6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34 12·06	82 18
81	10·56	8·92	7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96	83 18
82	12·44	11·22	9·67	8·30	7·06	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76 11·26	12·36	12·92	84 19
83	12·78	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00	6·90	6·56	7·46	9·22	11·16	12·56	85 19
84	13·57	14·06	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64	12·14	9·36	6·97 5·74	5·63	6·67	8·88	11·24	13·46	86 20
85	14·86	15·36	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60	16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	87 20
86	14·62	16·12	16·16	14·90	12·22	9·12	6·60	5·05	4·86	5·87	8·10	11·14	14·15	16·35	17·15	16·24 13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	88 21
87	15·64	17·04	16·75	14·92	11·81	8·56	6·27	5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	89 21
88	14·10	16·43	17·34	16·56	14·28	10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66 16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	90 22
89	14·74	16·66	17·13	15·64	12·86	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24	10·09	91 22
90	13·22	15·56	16·90	16·56	14·74	11·68	8·84	7·02	6·48	7·04 8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22	4·76	6·40	8·73	11·37	92 23
91	14·00	15·82	16·34	15·34	13·10	10·40	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76	6·67	5·40	5·22	6·16	7·85	9·97	93 23
92	12·30	14·30	15·48	15·46	14·27	12·24	10·20 8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16	13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	95 0
93	12·64	14·05	14·67	14·27	12·97	11·44	10·04	9·16	8·84	9·16	9·84	10·95	11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	96 0
94	10·90	12·34	13·52	13·80	13·26 12·13	10·96	10·04	9·60	9·33	9·54	9·90	10·56	11·44	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	97 1
95	10·73	11·93	12·74	12·98	12·60	11·86	11·07	10·34	9·94	9·77	9·87	10·02	10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	98 1
96	9·87	11·04 11·96	12·50	12·66	12·42	11·96	11·34	10·55	9·91	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	99 2
97	9·70	10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84 7·76	8·43	100 3
98	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44	11·06	9·52	8·12	7·40	7·47	101 3
99	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	6·81	6·84	7·92	9·62	11·52	13·00	13·97	14·12	13·00 11·02	9·05	7·48	6·74	6·92	102 4
100	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	5·58	6·14	7·76	9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66	6·02	103 4
101	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93	4·52	4·32	5·47	7·72	10·54	13·27 15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	104 5
102	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80	9·46	6·56	4·47	3·42	3·91	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	105 5
103	5·38	6·52	8·91	11·80	14·40	15·97	16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76 6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	106 6
104	5·57	7·24	10·07	13·10	15·40	16·44	15·82	13·44	9·74	6·67	4·03	2·50	2·77	4·44	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15	107 6
105	5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24 3·17	2·56	3·47	5·74	8·64	12·02	15·12	16·94	17·54	16·24	13·40	10·32	7·62	6·17	108 7
106	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67	9·40	12·47	15·00	16·74	16·94	15·60	13·03	10·01	7·87	109 7
107	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53 9·92	7·24	5·36	4·17	4·16	5·20	7·26	9·89	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	110 8
108	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60	5·96	4·93	5·02	5·86	7·52	9·74	12·00	13·87	14·87	14·77	13·76	12·06	10·26	111 8

109	8·74	7·82	7·54	8·00	9·34	11·00 12·36	12·96	12·72	11·58	10·14	8·48	6·94	6·06	5·96	6·60	7·87	9·72	11·62	13·34	14·34	14·44	13·66	12·26	10·62	112 9
110	9·10	8·03	7·66	7·76	8·68	10·20	11·63	12·43	12·66	12·10	10·96	9·47	8·14	7·03	6·54	6·88	7·94	9·57	11·42	13·00	14·07	14·44	13·93	12·76	113 9
111	11·00	9·18	7·74 6·96	6·96	7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	11·04	12·88	14·12	14·66	14·30	12·64	114 10
112	10·64	8·60	6·78	5·94	5·93	7·08	9·00	11·04	12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62	6·47	7·28	8·88	10·96	12·96	14·54	15·17	14·54 12·77	115 11
113	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	11·22	13·36	14·86	15·37	14·44	116 11
114	12·10	9·16	6·48	4·70	4·20	4·74	6·70	9·17	11·77	14·02	15·57	15·54	14·03	11·54	8·80	6·96	6·07	6·34	7·48	9·44	11·96 14·10	15·48	15·44	13·84	117 12
115	10·92	7·66	5·31	3·77	3·70	5·12	7·30	10·10	12·94	15·14	16·26	15·76	13·86	11·00	8·24	6·47	5·97	6·54	7·98	10·16	12·70	14·64	15·66	14·96	118 12
116	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	16·57	15·46	12·94	10·06	7·64	6·36	6·16 6·82	8·40	10·90	13·45	15·07	15·35	13·81	119 13
117	11·00	7·70	5·15	3·44	3·36	4·67	6·96	9·52	12·56	14·92	16·36	16·28	14·70	11·93	9·06	7·20	6·40	6·70	7·74	9·37	11·47	13·86	15·04	15·06	120 13
118	12·96	9·73	7·17	4·24	3·42	4·04	5·68	8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22 6·72	6·40	7·02	8·34	10·44	12·60	14·08	14·45	13·26	121 14
119	10·82	7·87	5·57	3·94	3·86	4·88	6·80	9·18	11·76	14·24	15·56	15·54	14·30	11·86	9·46	7·76	6·94	7·06	7·86	9·36	11·24	13·06	13·96	13·66	122 14
120	11·90	9·20	6·72	5·07	4·36	4·90	6·32	8·22	10·36	12·80	14·56	15·43	14·76 13·04	10·84	8·96	7·76	7·44	7·76	8·80	10·26	11·94	13·06	13·30	12·28	123 15
121	10·40	8·28	6·46	5·35	5·20	6·00	7·54	9·26	11·42	13·34	14·60	14·86	13·86	12·06	10·14	8·84	8·15	8·06	8·40	9·36	10·62	11·94	12·68	12·46	124 15
122	11·36	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10 13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46	8·56	9·00	9·74	10·55	11·36	11·86	11·68	125 16
123	10·72	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16	10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	126 16
124	11·34	10·58	9·56	8·46	7·76	7·66	7·97 8·66	9·74	10·97	12·22	13·24	13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	127 17
125	11·29	10·79	10·06	9·26	8·46	8·06	8·04	8·56	9·72	10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	128 17
126	11·34	11·77	11·44	10·70 9·74	8·78	8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	129 18
127	12·36	12·92	12·66	11·62	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	130 18
128	12·12 13·50	14·22	13·67	12·20	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06	6·42	8·60	10·95	131 19
129	13·28	14·84	15·34	14·46	12·38	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14	4·18	3·66	4·53	6·46 9·08	11·92	132 20
130	14·30	15·96	16·28	14·95	12·41	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76	10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	133 20
131	13·00	15·72	17·16	16·96	15·18	11·90	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02	15·97	15·24	12·56	8·86	5·70	3·17 1·97	2·43	4·23	7·22	10·62	134 21
132	13·96	16·50	17·69	17·06	14·58	10·90	8·02	5·94	5·46	6·30	8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	135 21
133	11·45	14·68	16·97	17·83	16·77	14·06	10·36	7·60	5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76 10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	136 22
134	12·24	15·14	17·16	17·74	16·33	13·21	10·00	7·30	5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	137 22
135	9·71	12·92	15·50	17·10	17·16	15·40	12·67	9·57	7·36	6·16	6·11	7·20	9·40	12·06 14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66	7·78	138 23
136	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74	4·98	5·26	6·33	139 23
137	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	7·72	6·96 6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76	10·08	8·18	6·84	6·28	6·46	7·26	141 0
138	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	6·86	6·52	6·83	8·02	9·54	11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	142 0
139	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92 11·14	9·14	7·48	6·36	5·86	5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	143 1
140	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82	9·01	7·20	5·72	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	144 1
141	7·47	7·63	8·26	9·76	11·56 13·14	14·05	13·96	12·62	10·76	8·52	6·66	5·32	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	145 2
142	7·52	7·50	8·44	10·16	11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	4·46	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	146 2
143	7·84	7·36	7·72 8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67	8·77	147 3
144	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	5·24	7·24	9·70	12·30	14·40	15·74	15·70	14·12	12·14	9·74 8·36	148 4
145	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	6·00	8·33	10·94	13·60	15·42	16·13	15·62	13·90	11·47	9·28	149 4
Sum	764·60	765·01	775·40	762·54	773·08	759·52	753·59	741·94	752·55	752·99	751·73	749·21	786·09	782·56	766·05	779·76	765·55	729·05	718·63	720·51	722·85	733·23	753·80	782·11	No. of Days.
No.	73	73	75	73	74	74	74	73	74	74	74	72	74	74	72	74	74	73	73	74	73	73	74	75	$73^d\ 14^h$. 18142·35

FORMS FOR SHORT-PERIOD TIDES.

SERIES M_2K_1.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
146	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26	7·20	9·70	12·28	14·66	15·94	16·04 14·86	12·64	10·27	8·44	150 5
147	7·54	7·34	8·10	9·52	11·55	13·36	14·27	13·92	12·06	9·48	6·90	5·12	4·32	4·97	6·54	8·70	11·00	13·46	15·32	16·07	15·67	14·17	11·77	9·56	151 5
148	8·16	7·68	7·83	8·74	10·50	12·26	13·66	14·02	12·96	10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	11·87 14·10	15·30	15·60	14·66	12·78	10·74	9·03	152 6
149	7·96	7·73	8·24	9·44	11·07	12·62	13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	12·74	14·30	15·12	15·06	13·65	11·84	10·00	153 6
150	8·46	7·75	7·78	8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87 8·17	9·67	11·58	13·28	14·64	14·97	14·22	12·62	11·08	9·47	154 7
151	8·38	8·08	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	10·30	11·90	13·54	14·68	14·80	13·77	12·16	10·50	155 7
152	9·20	8·47	8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	9·20	8·14 7·72	7·83	8·62	9·82	11·10	12·64	13·94	14·46	14·16	13·26	11·74	10·42	156 8
153	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32	8·36	9·00	10·04	11·54	12·92	13·86	14·25	13·85	12·88	11·48	157 8
154	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·26	12·14	12·58 12·36	11·84	11·02	10·06	9·23	8·78	9·20	10·37	11·98	13·44	14·22	14·34	13·94	12·86	11·59	158 9
155	10·03	8·74	7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	13·86	13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	15·14	14·88	13·86	159 9
156	12·46	10·48	8·82	7·82	7·50	8·19	9·46 11·28	13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	15·65	15·48	14·17	160 10
157	12·02	9·86	8·00	7·09	6·85	7·72	9·34	11·40	13·77	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	16·06	15·22	161 10
158	13·50	10·84	8·22	6·16 4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	16·29	15·33	162 11
159	12·77	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08	14·54	16·07	16·21	163 11
160	14·76 11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55	7·50	9·65	12·45	14·89	16·40	16·14	164 12
161	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17	7·55	6·20	6·18	7·30	9·60	12·79 15·16	16·42	15·96	165 13
162	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85	17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	16·05	166 13
163	15·26	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04	14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93 7·41	10·07	13·02	14·92	15·57	167 14
164	14·68	12·28	9·20	6·52	4·77	4·20	4·94	6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	168 14
165	14·85	14·05	11·96	9·47	7·26	6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84 8·61	6·86	6·32	6·58	7·80	9·82	12·04	13·55	169 15
166	14·17	13·54	12·03	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32	11·22	170 15
167	12·80	13·58	13·46	12·40	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74 14·75	13·73	12·02	10·10	8·46	7·12	6·53	6·70	7·50	9·03	10·90	171 16
168	12·32	13·20	13·38	12·92	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84	10·05	8·26	6·94	6·44	6·67	7·49	9·06	172 16
169	10·86	12·50	13·66	14·10	13·63	12·46	11·06	10·06	9·30	9·05	9·33 10·22	11·60	12·90	13·82	13·85	13·08	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	173 17
170	10·94	12·77	14·05	14·63	14·17	12·86	11·33	10·04	9·14	8·86	9·20	10·08	11·26	12·44	13·30	13·52	12·80	11·00	8·85	7·06	5·67	5·05	5·60	7·15	174 17
171	9·26	11·30	13·28	14·45	14·84	13·95	12·40	10·90 9·46	8·62	8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	175 18
172	9·76	12·14	14·01	15·00	14·86	13·77	12·06	10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	6·10	176 18
173	8·00	10·50	12·90	14·56	15·33 14·70	13·32	11·14	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	177 19
174	9·02	11·57	13·86	15·24	15·44	14·56	12·56	10·36	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94	4·22	5·70	178 19
175	7·84	10·40 12·82	14·74	15·56	15·33	13·80	11·44	9·35	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00	5·64	4·04	3·83	4·76	6·70	179 20
176	9·02	11·37	13·67	15·12	15·46	14·48	12·44	9·96	8·16	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68	12·22	9·64	6·86	4·96	3·98	4·36	5·65 7·72	180 21
177	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01	7·37	6·64	6·56	7·46	9·06	11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	181 21
178	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	6·51	7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70 5·02	5·24	6·42	8·07	182 22
179	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22	7·55	6·51	6·57	7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	183 22
180	9·24	10·97	12·94	14·38	14·88	14·20	12·50	10·34	8·44	7·22	6·77	6·97	7·87	9·34	10·94	12·19	12·66	12·22 10·84	9·25	7·90	6·96	6·92	7·56	8·50	184 23

181	10·00	11·48	13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14	185 23
182	9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	7·86	9·16 10·52	11·71	12·36	12·28	11·46	10·38	9·16	8·34	8·14	8·38	187 0
183	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	7·22	8·72	10·36	11·70	12·56	12·86	12·14	11·14	9·86	8·86	8·32	188 0
184	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74 5·32	5·74	6·86	8·67	10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	189 1
185	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31	4·90	6·40	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	190 1
186	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32 10·27	7·76	5·44	3·88	3·19	3·88	5·80	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	191 2
187	7·07	6·90	7·82	9·54	11·60	13·35	14·38	14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	192 2
188	7·42	6·03	6·04	7·17	9·30	11·84	13·92 15·05	14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	193 3
189	6·46	5·24	5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70	10·13	13·94	16·80	18·22	17·87	15·72	12·00	194 3
190	8·47	5·86	4·66	4·98 6·66	9·72	13·12	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	11·14	14·80	17·30	18·38	17·46	14·77	11·14	195 4
191	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66	12·13	15·36	17·38	17·97	16·76	13·80	196 4
192	10·58 7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82	5·12	6·97	9·80	13·00	15·56	17·04	17·17	15·44	12·60	197 5
193	9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04	8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	15·30	16·34 15·86	14·11	11·28	198 6
194	8·50	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30	14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	14·71	15·40	14·72	12·96	199 6
195	10·60	8·38	6·86	5·92	6·05	6·82	8·26	10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62 10·96	12·55	13·78	14·07	13·40	11·92	200 7
196	10·10	8·37	6·87	6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	13·14	13·41	12·71	201 7
197	11·34	9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96 10·04	9·53	9·52	9·76	10·73	11·74	12·78	13·04	12·50	202 8
198	11·42	10·20	8·76	7·52	6·90	6·70	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50	9·87	10·64	11·70	12·60	12·94	203 8
199	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14 13·28	12·08	10·74	9·52	8·94	8·94	9·48	10·50	11·72	12·63	13·06	204 9
200	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54	13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	205 9
201	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02 14·00	15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	206 10
202	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52	8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	207 10
203	14·66	14·04	11·84	8·90	6·50	5·04	4·74	5·78 7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	208 11
204	14·50	13·28	10·70	7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84	209 11
205	14·90	14·32	12·37	9·57	6·78 5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16	10·14	12·46	14·24	210 12
206	14·84	13·50	10·90	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16	6·33	7·34	9·23	11·44	13·54	211 12
207	14·58	14·24 12·42	9·84	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10	7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	212 13
208	14·37	13·56	11·51	8·97	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55	15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54 12·48	13·67	213 14
209	13·96	12·84	10·98	9·00	7·60	6·88	7·24	8·26	9·66	11·37	13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	214 14
210	13·26	13·32	12·36	10·84	9·38	8·24	7·77	8·12	8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50 7·54	9·00	10·63	12·05	215 15
211	12·96	13·18	12·64	11·47	10·24	9·16	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	216 15
212	12·10	13·14	13·55	13·28	12·50	11·34	10·26	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50 7·86	6·50	5·94	6·16	7·10	8·50	10·20	217 16
213	11·94	13·44	14·14	14·16	13·42	12·16	10·76	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30	5·46	6·46	8·25	218 16
214	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	9·16	8·56	8·76	9·78	11·16	12·57	13·70 14·26	14·02	12·80	10·52	8·01	5·84	4·76	4·81	5·98	7·77	219 17
215	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	8·38	7·60	7·78	8·76	10·54	12·56	14·24	15·18	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	220 17
216	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	7·44	6·60	6·85 8·10	10·22	12·92	15·15	16·26	15·72	13·66	10·33	6·96	4·40	3·04	3·33	5·32	221 18
217	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82	6·46	5·54	5·95	7·72	10·60	13·60	16·07	17·04	16·38	13·96	10·25	6·47	3·74	2·56	3·20	222 18
Sum	798·16	780·21	734·29	729·30	733·03	715·16	749·27	756·64	761·77	772·68	791·99	790·74	791·00	812·56	809·25	774·39	754·66	762·43	732·82	731·70	764·66	784·22	782·28	786·50	No. of Days.
No.	74	74	72	74	74	72	74	74	73	73	74	74	73	74	75	73	73	75	73	73	75	74	73	73	73^{d} 14^{h}. 18399·71

FORMS FOR SHORT-PERIOD TIDES.

SERIES M_2K_1.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
218	5·12	8·18	11·74	15·30	17·66	18·50	17·76	14·76	10·60 7·27	5·06	4·48	5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	223 19
219	5·73	9·03	12·78	15·94	17·78	18·04	16·74	13·32	9·36	6·05	4·18	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	224 19
220	4·58	7·04	10·14	13·35	16·16	17·52 17·26	15·28	11·80	8·22	5·32	3·80	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62	4·54	4·80	225 20
221	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36	10·62	7·94	6·32	5·74	226 20
222	6·44	7·77	9·72	12·07 14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	5·84	7·33	9·54	11·87	13·60	14·46	13·96	12·48	10·40	8·65	7·45	7·28	227 21
223	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	6·74	8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	228 21
224	8·90 9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02	6·68	7·00	7·70	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	229 22
225	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23	9·96	8·64	7·77	7·46	7·69	8·30	9·04	10·10	11·17	12·34	12·90	12·90	12·34 11·72	11·15	10·62	230 23
226	10·30	10·00	10·14	10·50	11·34	11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	231 23
227	10·72	10·26	9·92	9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	8·54	9·82	11·43 12·72	13·64	13·66	13·26	12·36	11·22	233 0
228	10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	8·37	10·20	11·94	13·38	14·40	14·54	13·58	12·17	234 0
229	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14 7·20	8·95	10·80	12·76	13·96	14·91	14·84	13·64	11·84	235 1
230	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35	7·80	9·76	11·70	13·66	15·10	15·46	14·62	12·86	236 1
231	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24 6·24	5·17	5·36	6·54	8·54	10·66	13·00	15·02	15·96	15·50	14·08	11·60	237 2
232	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67	12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	11·94	14·36	16·04	16·27	15·32	13·08	238 2
233	10·11	7·72	6·36	6·10	6·94	8·63	10·83	13·20	15·21	15·71	14·43 11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	15·80	16·62	16·16	14·21	11·38	239 3
234	8·34	6·35	5·46	5·74	7·13	9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	16·24	16·56	15·34	12·80	240 3
235	9·60	7·06	5·50	5·18	5·94	7·72	10·28	13·04 15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	16·38	15·97	14·06	11·04	241 4
236	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46	15·84	14·77	12·44	242 4
237	9·37	7·06	5·37	4·85	5·64 7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38	12·36	14·06	15·24	15·10	13·64	11·26	243 5
238	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02	7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	12·25	244 5
239	10·02	8·06 6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44	11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	11·68	245 6
240	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55	13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92 12·66	11·74	246 7
241	10·42	8·87	7·44	6·44	6·21	6·66	7·76	9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	247 7
242	12·36	11·16	9·57	7·60	6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14 9·04	10·38	12·00	13·14	13·74	248 8
243	13·40	12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06	13·93	249 8
244	14·86	14·44	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04 8·24	6·27	5·15	5·63	7·24	9·64	12·52	14·74	250 9
245	15·98	15·46	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98	6·70	4·46	3·84	4·58	6·80	10·06	13·28	251 9
246	15·76	16·64	15·75	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53 15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	252 10
247	16·50	17·05	15·47	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94	13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	253 10
248	14·94	16·86	16·90	14·94	11·54	8·00	5·38	3·90	4·20	5·52	7·95	11·06 14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	254 11
249	15·42	16·68	16·10	13·81	10·56	7·46	5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	255 11
250	13·44	15·47	16·04	14·92	12·66	9·98	7·74	6·47	6·36 7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04	256 12
251	13·56	14·79	14·77	13·46	11·46	9·44	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34	7·60	9·36	257 12
252	11·36	13·14	13·88	13·60	12·43	10·94 9·64	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04	6·44	6·67	7·34	8·36	9·74	258 13

253	11·16	12·22	12·70	12·20	11·38	10·60	9·88	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37	10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	259 13
254	9·84	10·90	11·62 11·97	11·87	11·54	11·08	10·42	9·92	9·60	9·42	9·54	9·86	10·24	10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	260 14
255	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	10·23	9·48	9·04	9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64 8·34	261 15
256	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96	9·85	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	262 15
257	7·74	9·24	10·86	12·34	13·24	13·55	13·17	12·08	10·64	9·21	8·06	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86 6·55	6·10	6·54	263 16
258	7·88	9·68	11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50	264 16
259	6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04 12·68	10·30	7·96	6·07	5·14	5·48	265 17
260	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	5·30	6·12	7·84	9·97	12·54	14·50	15·33	14·46	12·23	9·34	6·94	5·36	4·94	266 17
261	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	4·66	6·00	8·44	11·24 13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	267 18
262	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	4·93	6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	4·88	268 18
263	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47	5·10	3·54	3·83 5·50	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	269 19
264	6·51	8·50	11·14	13·77	15·60	15·98	14·86	12·14	8·87	6·16	4·30	3·67	4·60	6·44	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	270 19
265	6·17	7·42	9·65	12·22	14·26	15·46	15·24	13·48	10·57	7·65 5·42	3·96	4·06	5·34	7·30	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	271 20
266	7·20	8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86	7·87	272 20
267	7·56	7·92	8·94	10·67	12·44	13·74	13·97 12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	10·76	12·86	14·16	14·44	13·68	12·40	10·86	9·52	8·53	273 21
268	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	10·63	12·30	13·68	14·16	13·66	12·66	11·46	10·12	274 21
269	9·18	8·77	8·56	9·10	10·17 11·30	12·30	12·61	12·14	11·16	9·92	8·44	7·14	6·37	6·38	7·34	8·76	10·57	12·10	13·44	13·92	13·88	13·56	12·37	11·18	275 22
270	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77	7·94	6·58	6·06	6·50	7·97	9·84	11·56	13·26	14·17	14·66	14·52	13·27	276 22
271	11·34	9·06 7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04	13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	11·97	13·90	15·26	15·99	15·54	13·97	277 23
272	11·26	8·63	6·70	5·98	6·37	7·97	10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	12·14	14·54	16·28	16·98 16·37	13·80	279 0
273	10·49	7·50	5·61	5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	12·74	15·25	16·92	17·15	15·62	280 0
274	12·54	8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58 13·66	16·26	17·40	16·86	14·56	281 1
275	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77	11·76	14·62	16·82	17·12	15·72	282 1
276	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44 6·06	7·47	10·01	12·74	15·12	16·37	16·06	14·21	283 2
277	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36	7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	15·64	14·36	284 2
278	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24	16·32	14·74	12·13 9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	14·26	12·74	285 3
279	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30	12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	13·06	286 3
280	11·36	9·07	7·14	5·84	5·47	6·20	7·44	9·04	10·97	13·06	14·36	14·36 13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	11·46	287 4
281	10·00	8·37	7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46	288 4
282	10·73	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91 11·17	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86	10·44	10·68	10·66	289 5
283	10·30	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77	8·68	8·96	9·55	10·22	10·70	290 5
284	10·88	10·82	10·57	10·03	9·26	8·44 7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07	11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	291 6
285	11·50	11·78	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94	13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	292 6
286	11·94	12·78	12·88 12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02	11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	293 7
287	13·07	13·96	13·77	12·48	10·52	8·76	7·36	6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30 12·80	294 8
288	14·34	15·00	14·16	12·26	9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	295 8
289	14·15	15·84	15·96	14·52	12·00	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86 5·14	7·32	10·15	13·10	296 9
290	15·67	16·78	16·26	14·16	11·00	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04	3·57	5·44	8·15	11·37	297 9
Sum	755·82	747·60	747·56	734·08	744·58	777·64	767·21	776·91	797·38	777·38	774·20	773·75	746·31	739·01	748·30	762·19	766·54	757·39	787·53	784·99	775·45	794·98	804·28	787·02	No. of Days.
No.	74	75	75	74	75	76	74	74	76	74	74	75	75	74	74	75	75	73	75	75	74	75	75	75	74ᵈ 15ʰ. 18428·10

FORMS FOR SHORT-PERIOD TIDES.

SERIES M_2K_1.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
291	14·60	16·81	17·35	16·28	13·64	10·44	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55	5·46 3·46	2·87	4·17	6·35	9·32	13·00	298 10
292	15·95	17·47	17·44	15·72	12·68	9·66	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60	13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	10·55	299 10
293	13·92	16·35	17·36	16·74	14·57	11·67	8·85	6·76	5·94	6·28	7·70	9·92	12·68	14·78	15·58	14·78 12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	300 11
294	14·10	16·17	16·96	16·12	14·06	11·35	8·82	7·14	6·57	7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	301 11
295	11·88	14·60	16·14	16·22	15·16	13·26	10·86	8·86	7·58	7·14	7·44	8·84	10·92 12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	302 12
296	11·72	14·00	15·22	15·38	14·58	12·88	11·01	9·42	8·12	7·64	7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	303 12
297	9·44	11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54 7·93	7·84	8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01	7·06	7·90	304 13
298	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	7·22	7·02	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36	9·70	8·28	7·14	6·80	305 13
299	7·40	8·84	10·74	12·56	13·87	14·54	14·38 13·40	11·67	9·60	7·53	6·30	5·88	6·50	8·20	10·07	11·93	13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	306 14
300	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	5·44	5·04	5·86	7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	307 14
301	6·44	6·77	8·02	10·14 12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82	4·22	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	308 15
302	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03	12·98	9·78	7·04	4·71	3·46	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	309 15
303	6·25	5·93 6·71	8·67	11·25	13·84	15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	310 16
304	6·32	6·37	7·46	9·60	12·20	14·33	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10 8·66	6·87	311 17
305	6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	6·18	9·01	12·24	14·92	16·53	16·56	15·16	12·66	10·06	7·96	312 17
306	6·74	6·60	7·35	9·00	11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	7·72	10·56	13·46	15·64	16·34 15·71	13·92	11·46	9·28	7·66	313 18
307	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	9·14	11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	314 18
308	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31	5·50	6·66	8·34	10·52 12·80	14·44	15·16	14·68	13·32	11·56	10·02	8·76	315 19
309	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16	7·62	6·54	6·20	6·84	7·96	9·38	11·14	12·91	14·18	14·40	13·64	12·37	10·90	9·58	316 19
310	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80	11·36	10·28	8·94	7·84	7·18	7·20 7·86	8·80	9·98	11·46	12·86	13·86	13·83	12·96	11·72	10·53	9·66	317 20
311	9·14	8·92	8·96	9·17	9·66	10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	12·76	13·34	13·26	12·61	11·72	10·86	318 20
312	9·76	9·04	8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06 10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	12·48	13·10	13·15	12·64	11·84	10·76	319 21
313	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	12·41	13·07	13·16	12·84	11·84	320 21
314	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03 11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96	10·02	11·20	12·46	13·23	13·47	13·00	11·72	321 22
315	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76	7·98	7·96	8·75	10·13	11·64	13·14	13·94	13·94	13·04	322 22
316	11·34	9·30	7·45	5·86	5·13	5·46 6·76	8·80	11·15	13·20	14·66	14·98	13·87	11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	14·28	14·14	12·87	323 23
317	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40	15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	14·74	14·20	324 23
318	12·26	9·36	6·51 4·12	2·75	2·94	4·56	7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	15·08	13·97	326 0
319	11·41	8·07	4·96	2·57	1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	15·17 13·27	327 1
320	9·96	6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44	15·50	14·80	328 1
321	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26	10·06 12·76	14·67	15·26	14·06	329 2
322	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16	5·50	5·88	7·64	10·25	12·77	14·29	14·72	330 2
323	13·33	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28	12·84	9·93	7·47	6·23 5·72	6·26	7·94	10·30	12·38	13·76	13·96	331 3
324	12·68	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	12·05	14·37	15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	332 3
325	13·16	12·24	10·73	8·96	7·30	6·24	5·96	6·50	7·80	9·84	12·15	13·88	14·87	14·84	13·77 11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	333 4

326	12·76	12·53	11·48	10·14	8·60	7·52	7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	334 4
327	11·84	12·86	13·08	12·42	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16 14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40	335 5
328	12·07	13·31	13·88	13·62	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23	6·52	8·50	336 5
329	10·56	12·60	14·12	14·40	13·86	12·58	10·80	8·97	7·94	7·68 8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10	6·84	5·06	4·41	5·04	6·57	8·66	337 6
330	11·20	13·52	15·24	15·84	15·08	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46	13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	338 6
331	9·54	12·26	14·54	16·11	16·34	15·17	12·88 10·26	8·38	7·53	7·40	8·14	9·77	11·52	13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	339 7
332	10·61	13·20	15·47	16·54	16·21	14·70	12·20	9·81	8·08	7·33	7·37	8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	340 7
333	9·06	11·87	14·55	16·23 16·72	15·97	13·94	11·34	8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	341 8
334	10·36	13·16	15·34	16·56	16·48	15·11	12·72	10·27	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	342 8
335	9·02 11·70	14·07	15·87	16·56	15·80	13·96	11·44	9·32	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03	8·20	343 9
336	10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64	5·07 5·86	7·43	9·20	344 10
337	11·48	13·56	15·[illegible]7	15·82	15·18	13·58	11·42	9·46	7·98	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36	8·34	6·54	5·59	5·67	6·77	8·43	345 10
338	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	7·38	7·80	8·82	10·22	11·48	12·26	12·24	11·15	9·47	8·01 6·87	6·45	6·75	7·83	9·14	346 11
339	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	7·73	8·27	9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	347 11
340	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76	8·24	8·24	8·80	9·62	10·53	11·27	11·70 11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	348 12
341	10·70	12·04	13·16	13·78	13·79	13·14	11·94	10·54	9·17	8·30	7·83	8·04	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	349 12
342	9·74	10·90	12·24	13·16	13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	7·86 8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	350 13
343	9·55	10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	6·15	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68	8·84	351 13
344	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18 5·75	4·90	4·92	6·07	7·94	10·07	12·03	13·66	14·48	14·16	12·76	10·77	9·04	7·98	352 14
345	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	8·50	6·30	4·47	3·64	4·12	5·82	8·20	10·84	13·27	14·95	15·70	14·97	13·05	10·60	8·64	353 14
346	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26 13·00	10·50	7·72	5·17	3·42	2·93	4·16	6·37	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	354 15
347	6·98	7·04	8·06	10·00	12·15	14·04	15·14	15·03	13·10	10·20	7·00	4·27	2·40	2·20	3·93	6·57	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	355 15
348	7·27	6·14	6·30	7·56	9·86 12·72	14·77	15·81	15·20	12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	356 16
349	6·58	5·67	6·00	7·50	10·14	13·10	15·24	16·17	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	11·93	15·00	17·66	18·34	17·37	14·51	10·92	357 16
350	7·77	5·66	5·14 5·64	7·65	10·63	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	12·30	15·56	17·50	17·88	16·62	13·58	9·97	358 17
351	6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	13·01	15·80	17·38	17·48	15·95	12·86 9·53	359 18
352	6·72	5·22	4·90	5·87	8·03	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	13·25	15·58	16·60	16·14	14·11	11·13	360 18
353	8·76	6·38	5·17	5·13	6·30	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14	8·74	10·77	13·13	14·96 15·71	15·12	13·32	10·86	361 19
354	8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22	7·96	7·33	7·28	7·93	9·16	10·97	13·12	14·54	14·68	13·66	12·28	362 19
355	10·12	8·24	6·78	5·82	5·70	6·37	7·72	9·40	11·06	12·32	12·86	12·50	11·47	10·24	9·12	8·42	8·24	8·54 9·54	11·12	12·64	13·57	13·57	12·88	11·44	363 20
356	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94	10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	8·58	8·66	9·44	10·68	11·96	12·92	13·14	12·66	364 20
357	11·54	10·06	8·36	6·86	5·72	5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57 10·28	9·14	8·62	8·63	9·20	10·44	11·66	12·53	12·92	12·58	365 21
358	11·64	9·77	7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	12·36	13·08	366 21
359	12·90	11·65	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27 15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32	11·70	12·96	13·58	367 22
360	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	8·38	7·80	7·97	9·00	10·56	12·24	13·46	368 22
361	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78 12·44	14·65	15·93	15·94	14·74	12·37	10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	369 23
362	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	734·56	729·89	739·21	759·66	755·75	759·88	778·28	767·68	726·65	735·55	710·75	696·56	707·06	706·32	729·72	734·99	759·65	762·37	758·89	780·36	782·26	753·57	746·55	746·78	No. of Days.
No.	73	73	74	73	72	72	73	73	71	74	73	72	73	73	73	72	73	73	72	73	73	72	72	73	72d 17h. 17862·94

FORMS FOR SHORT-PERIOD TIDES.

BOMBAY—Commencing 0 hours, Astronomical Time, 1st January, 1885.

Argument $(3\gamma - 4\sigma)$. SERIES $2M_2K_1$. Motion per mean Solar hour = 42°·9271398.

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
1	15·52	13·96	9·13	5·76	3·03	1·68	2·28	4·80	7·90	11·70	15·50 18·00	18·85	18·08	15·14	11·54	8·50	6·21	5·53	6·08	8·20	11·31	14·16	16·06	16·66	2 0
2	15·40	12·16	8·40	4·86	2·56	1·71	2·90	5·56 8·82	12·94	16·44	18·58	18·97	17·67	14·24	10·56	7·53	5·57	5·16	6·10	8·63	11·84	14·68	16·63	16·96	3 1
3	15·24	11·92	8·00	4·87	2·80 2·57	4·24	6·84	10·20	14·07	17·26	18·86	18·84	17·06	13·20	9·77	6·90	5·23	4·96	6·16	8·86	12·14	14·87	16·40	16·40	4 2
4	14·28 11·00	7·63	4·88	3·55	3·86	5·55	8·01	11·30	14·83	17·16	18·38	17·93	15·80	12·16	8·68	6·10	5·05	5·25	6·68	9·24	12·28	14·51 15·96	15·58	13·48	5 4
5	10·47	7·54	5·76	5·07	5·67	7·22	9·17	12·11	15·02	17·02	17·55	16·63	14·11	10·96	8·16	6·22	5·47	5·84	7·18 9·67	12·12	14·04	15·00	14·45	12·62	6 5
6	10·24	8·07	7·04	6·84	7·54	8·67	10·60	12·84	15·06	16·36	16·35	15·24	12·76	10·11	8·00	6·64 6·17	6·55	7·86	9·76	11·80	13·27	14·00	13·64	12·22	7 6
7	10·47	9·05	8·44	8·46	9·03	9·97	11·20	13·05	14·64	15·46	15·18	13·87 11·68	9·76	8·10	7·16	7·03	7·40	8·29	9·82	11·16	12·55	13·24	13·07	12·20	8 7
8	11·16	10·27	9·64	9·60	9·90	10·60	11·70	12·96	14·02 14·44	13·75	12·27	10·82	9·20	7·93	7·24	7·06	7·34	8·07	9·14	10·55	11·74	12·48	12·66	12·27	9 8
9	11·60	10·93	10·34	9·98	9·86	10·17 11·07	12·14	13·06	13·36	12·72	11·71	10·43	9·14	7·97	7·14	6·75	6·94	7·74	8·96	10·26	11·64	12·67	13·14	12·97	10 9
10	12·20	11·24 10·48	10·12	10·05	10·23	10·84	11·64	12·27	12·68	12·37	11·53	10·42	8·97	7·80	6·96	6·38	6·44	7·28	8·73	10·47	12·14	13·23	13·84 13·63	12·58	11 11
11	11·38	10·27	9·77	9·62	9·89	10·44	11·24	11·97	12·52	12·50	11·87	10·54	8·76	7·34	6·16	5·74	6·34	7·62	9·54	11·46 13·22	14·24	14·58	13·94	12·72	12 12
12	11·24	10·02	9·32	9·14	9·46	10·37	11·48	12·46	13·04	12·84	11·88	10·23	8·20	6·52	5·62	5·56	6·50 8·14	10·17	12·34	14·10	15·20	15·17	13·97	12·27	13 13
13	10·58	9·35	8·75	8·76	9·26	10·34	11·68	12·96	13·64	13·36	11·80	9·66	7·32 5·82	5·14	5·44	6·74	8·86	11·26	13·66	15·38	15·87	15·24	13·66	11·54	14 14
14	9·82	8·71	8·16	8·36	9·30	10·74	12·46	13·64	13·98	13·00 10·84	8·24	6·20	4·76	4·46	5·40	7·36	9·78	12·57	14·82	16·13	15·97	14·56	12·25	10·05	15 15
15	8·46	7·82	7·74	8·41	9·71	11·76	13·30 14·26	14·09	12·44	9·76	7·00	5·12	4·20	4·63	6·12	8·44	11·24	14·04	15·74	16·36	15·71	13·82	11·22	8·94	16 16
16	7·54	6·94	7·15 8·40	10·27	12·44	14·06	14·68	13·84	11·50	8·60	5·94	4·37	4·02	5·06	7·26	9·66	12·72	15·20	16·55	16·63	15·27	12·77	9·97	7·86 6·84	17 18
17	6·68	7·56	9·32	11·40	13·55	14·80	14·78	13·22	10·43	7·48	5·34	4·39	4·66	6·25	8·54	11·38	14·15	16·15	16·88	16·08	14·04 11·02	8·54	6·76	6·12	18 19
18	6·34	7·60	9·84	12·14	14·06	14·84	14·14	12·06	9·06	6·46	4·67	4·24	5·16	7·15	9·68	12·56	14·87	16·44 16·45	15·00	12·42	9·50	7·22	5·80	5·43	19 20
19	6·26	8·16	10·65	12·88	14·28	14·56	13·33	10·92	8·30	6·04	4·87	5·06	6·54	8·66 11·04	13·64	15·62	16·36	15·76	13·82	11·00	8·37	6·37	5·54	5·64	20 21
20	6·83	8·93	11·40	13·32	14·42	14·25	12·47	10·10	7·91	6·34	5·70 6·30	7·70	9·76	12·17	14·36	15·74	15·96	14·86	12·76	10·13	7·78	6·17	5·70	6·11	21 22
21	7·62	9·70	11·76	13·36	14·14	13·72	12·06	9·94 8·32	7·22	7·01	7·74	8·97	10·80	12·97	14·62	15·50	15·17	13·80	11·46	9·14	7·34	6·17	6·00	6·68	22 23
22	8·02	9·76	11·65	13·04 13·76	13·34	12·14	10·65	9·07	8·15	8·14	8·68	9·86	11·56	13·36	14·56	15·02	14·37	12·76	10·76	8·71	6·96	6·23	6·09	6·68	24 0
23	7·86 9·46	11·24	12·66	13·36	13·34	12·38	11·08	9·94	9·11	8·88	9·28	10·22	11·70	13·06	14·14	14·41	13·60	12·06	10·26	8·46	7·10	6·25 6·08	6·56	7·64	25 2
24	9·14	10·84	12·34	13·44	13·81	13·33	12·18	10·75	9·76	9·24	9·34	10·07	11·16	12·40	13·38	13·66	13·03	11·87	10·24 8·47	7·00	5·83	5·38	5·68	6·78	26 3
25	8·55	10·33	12·22	13·56	14·30	14·16	13·05	11·56	10·06	9·11	8·87	9·40	10·46	11·87	12·94 13·44	13·33	12·40	10·74	8·86	6·83	5·22	4·41	4·77	6·10	27 4
26	8·10	10·50	12·63	14·53	15·56	15·33	13·76	11·64	9·52	8·28	7·92	8·25 9·53	11·24	12·70	13·80	14·14	13·30	11·34	8·72	6·20	4·24	3·38	3·76	5·30	28 5
27	7·76	10·55	13·50	15·72	16·74	16·12	14·36	11·40	8·83 7·24	6·86	7·53	9·20	11·11	12·97	14·55	15·08	14·17	11·84	8·82	5·70	3·60	2·56	3·06	5·04	29 6
28	7·88	11·48	14·56	17·04	17·86 17·00	14·36	10·96	8·07	6·27	5·77	6·57	8·62	11·25	13·92	15·74	16·28	14·96	12·18	8·44	5·42	3·22	2·16	3·07	5·52	30 7
29	8·75	12·46 16·01	18·10	18·47	17·26	13·80	10·14	7·09	5·27	5·02	6·02	8·40	11·85	14·65	16·52	16·84	15·28	11·68	7·88	4·80	2·74	2·38	4·00 6·66	10·10	31 9
30	13·98	17·01	18·64	18·38	16·30	12·42	8·97	6·01	4·46	4·57	6·12	9·14	12·56	15·46	17·00	16·86	14·76	11·06	7·36 4·34	2·72	2·99	4·86	7·74	11·40	32 10
31	14·94	17·54	18·47	17·66	14·67	11·08	7·54	5·01	3·93	4·32	6·55	9·62	13·04	15·80	16·84	16·08 13·73	10·16	6·82	4·54	3·58	4·44	6·36	9·36	12·84	33 11
32	15·86	17·74	17·94	16·48	13·27	9·84	6·84	4·96	4·33	5·26	7·44	10·66	13·70 15·74	16·43	15·42	12·82	9·66	6·90	5·42	5·14	6·20	8·06	10·66	13·66	34 12
33	16·02	17·12	16·74	14·88	11·68	8·76	6·34	4·92	4·74	5·86 8·26	11·07	13·60	15·16	15·34	14·06	11·68	9·04	7·34	6·56	6·94	8·04	9·56	11·76	14·24	35 13
34	15·60	16·04	15·34	13·02	10·16	7·86 6·27	5·54	5·86	7·18	9·07	11·36	13·26	14·34	14·26	12·88	11·00	9·39	8·26	7·92	8·30	9·05	10·36	12·08	13·76	36 14
35	14·66	14·44	13·11 11·12	9·30	7·54	6·26	6·13	6·68	7·86	9·28	10·86	12·27	13·10	12·94	11·93	10·66	9·72	9·12	9·06	9·26	9·66	10·60	11·82	12·86 13·34	37 16

36	12·82	11·45	10·03	8·74	7·48	6·86	6·78	7·17	7·94	9·05	10·30	11·34	11·97	11·92	11·42	10·84	10·34	10·07	9·97	9·77 / 9·94	10·44	11·32	12·06	12·26	38 17
37	11·78	10·88	9·87	8·84	7·86	7·24	6·94	7·18	8·03	9·07	10·14	11·00	11·56	11·85	11·77	11·46	11·12 / 10·57	10·07	9·70	9·70	10·13	10·80	11·27	11·45	39 18
38	11·25	10·76	9·97	9·00	8·00	7·11	5·58	6·74	7·44	8·51	9·84	10·90	11·76	12·34 / 12·55	12·30	11·60	10·57	9·76	9·34	9·17	9·56	10·24	10·94	11·36	40 19
39	11·44	10·97	10·10	9·07	7·87	6·85	6·30	6·50	7·26	8·50	10·16 / 11·44	12·65	13·26	13·32	12·56	11·36	10·08	9·16	8·67	8·64	9·01	9·76	10·58	11·25	41 20
40	11·66	11·34	10·36	8·82	7·36	6·12	5·54 / 5·82	6·94	8·54	10·36	12·06	13·46	13·97	13·64	12·30	10·76	9·26	8·14	7·84	8·12	8·96	10·24	11·52	12·40	42 21
41	12·66	12·07	10·47	8·56 / 6·64	5·46	5·20	5·93	7·55	9·56	11·72	13·53	14·67	14·84	13·98	12·14	10·00	8·54	7·66	7·53	8·16	9·56	11·03	12·66	13·62	43 22
42	13·60 / 12·30	10·24	7·77	5·88	4·84	4·96	6·33	8·27	10·66	13·07	14·85	15·64	15·23	13·64	11·13	9·02	7·54	6·79	7·00	8·13	9·87 / 11·85	13·60	14·38	13·88	45 0
43	11·93	9·10	6·54	4·66	4·00	4·90	6·86	9·20	11·97	14·34	15·82	15·96	14·78	12·26	9·64	7·46	6·24	5·96 / 6·74	8·48	10·85	13·07	14·56	14·85	13·63	46 1
44	10·90	7·86	5·57	4·07	4·04	5·46	7·84	10·63	13·64	15·83	16·64	16·01	13·87	10·90	8·00 / 6·17	5·46	5·74	7·26	9·70	12·25	14·42	15·50	15·15	13·08	47 2
45	9·90	6·94	4·75	3·92	4·66	6·62	9·46	12·60	15·08	16·60	16·64	15·00 / 11·93	8·96	6·76	5·63	5·06	5·54	7·84	10·54	13·30	15·12	15·66	14·46	11·76	48 3
46	8·44	5·86	4·26	4·25	5·52	7·84	10·68	13·68 / 15·84	16·68	15·86	13·15	10·22	7·36	5·65	4·23	4·46	6·07	8·56	11·57	14·06	15·54	15·51	13·57	10·53	49 4
47	7·47	5·38	4·52	5·04	6·70 / 9·14	12·18	14·74	16·26	16·26	14·64	11·74	8·68	6·28	4·54	4·14	5·07	7·06	9·74	12·44	14·55	15·46	14·76	12·57	9·68	50 5
48	7·24	5·84 / 5·60	6·54	8·40	10·77	13·32	15·42	16·26	15·47	13·18	10·24	7·54	5·62	4·54	4·69	5·80	7·87	10·40	12·80	14·50	15·06	14·03 / 11·86	9·36	7·58	51 7
49	6·64	6·76	7·86	9·60	11·66	13·73	15·08	15·32	14·12	11·86	9·24	6·90	5·18	4·58	5·06	6·46	8·24	10·33	12·41 / 13·86	14·34	13·44	11·46	9·53	8·05	52 8
50	7·40	7·66	8·58	9·92	11·68	13·36	14·16	14·12	12·82	10·83	8·73	6·87	5·45	4·92	5·44	6·63 / 8·23	10·14	11·77	12·96	13·40	12·76	11·56	10·24	9·04	53 9
51	8·45	8·28	8·67	9·76	11·20	12·50	13·18	13·06	11·88	10·25	8·57	6·98 / 5·77	5·38	5·64	6·37	7·82	9·54	11·17	12·38	13·02	12·96	12·16	11·07	10·02	54 10
52	8·94	8·44	8·48	9·27	10·44	11·57	12·34	12·34	11·70 / 10·50	8·90	7·32	5·96	5·24	5·12	5·86	7·17	8·90	10·63	12·10	13·16	13·56	13·13	11·86	10·27	55 11
53	8·88	8·08	7·87	8·42	9·56	10·87 / 11·93	12·44	12·26	11·27	9·76	7·96	6·27	5·06	4·55	5·02	6·47	8·52	10·67	12·72	14·14	14·86	14·44	12·70	10·66	56 12
54	8·80	7·60	7·21 / 7·64	9·18	11·00	12·40	13·36	13·52	12·60	10·86	8·63	6·40	4·63	4·06	4·70	6·46	8·84	11·30	13·80	15·56	16·25	15·33	12·96 / 10·26	7·95	57 14
55	6·54	6·18	7·03	8·83	11·00	12·96	14·40	14·74	13·76	11·70	8·84	6·08	4·05	3·42	4·14	6·18	8·80	12·06	14·93	16·76 / 17·15	15·84	12·87	9·66	7·00	58 15
56	5·18	5·12	6·26	8·52	11·16	13·67	15·38	15·86	14·57	11·93	8·26	5·48	3·42	2·92	4·14	6·52	9·58 / 13·16	16·04	17·62	17·34	15·27	11·66	8·27	5·56	59 16
57	4·16	4·32	5·84	8·66	11·92	14·74	16·46	16·54	14·66	11·26	7·66	4·94	3·20 / 3·27	4·70	7·52	10·86	14·63	17·06	17·98	16·96	13·90	10·20	6·96	4·47	60 17
58	3·56	4·02	6·04	9·40	12·86	15·55	16·86	16·36	13·86	10·44 / 6·92	4·54	3·37	3·90	5·80	8·56	12·33	15·44	17·27	17·40	15·46	12·03	8·50	5·70	3·74	61 18
59	3·27	4·33	7·10	10·34	13·76	15·97	16·76 / 15·76	12·96	9·44	6·74	4·67	4·23	5·26	7·43	10·37	13·82	16·13	17·08	16·40	13·86	10·50	7·26	4·84	3·56	62 19
60	3·86	5·60	8·27	11·55 / 14·34	16·02	16·28	14·66	11·66	8·60	6·46	5·26	5·46	6·56	8·86	11·44	14·36	15·97	16·18	14·88	12·00	8·86	6·28	4·57	4·06 / 4·86	63 21
61	6·67	9·40	12·24	14·39	15·64	15·33	13·25	10·46	8·22	6·76	6·34	7·00	8·36	10·22	12·44	14·42	15·27	14·71	12·72	10·14	7·72 / 5·93	4·86	5·00	6·10	64 22
62	8·03	10·30	12·47	13·97	14·58	13·92	12·03	10·14	8·54	7·56	7·56	8·42	9·82	11·34	12·96	14·04	14·24	13·22 / 11·36	9·36	7·56	6·27	5·84	6·34	7·46	65 23
63	9·00	10·76	12·44	13·56	13·74	12·74	11·40	10·07	9·16	8·96	9·27	9·77	10·46	11·36 / 12·44	13·07	13·03	12·12	10·46	8·86	7·68	7·02	7·02	7·66	8·54	67 0
64	9·66	10·96	12·24	12·88	12·88	12·24	11·43	10·66	10·24	10·16	10·24 / 10·47	10·86	11·44	12·02	12·40	12·24	11·36	10·18	8·87	7·97	7·67	7·94	8·50	9·00	68 1
65	9·78	10·74	11·76	12·46	12·67	12·27	11·74	11·26 / 10·87	10·56	10·36	10·22	10·36	10·76	11·26	11·56	11·38	10·86	9·96	9·14	8·40	7·98	7·80	7·86	8·34	69 2
66	9·30	10·46	11·44	12·08	12·36 / 12·27	12·03	11·50	10·78	10·20	9·73	9·58	9·87	10·35	10·89	11·10	11·10	10·78	10·32	9·72	8·86	7·97	7·28	7·26	7·87	70 3
67	8·97 / 10·32	11·56	12·46	13·04	13·10	12·54	11·68	10·56	9·64	9·08	8·82	9·16	9·88	10·74	11·40	11·75	11·70	11·14	10·07	8·84	7·56	6·74 / 6·70	7·63	8·94	71 5
68	10·62	12·06	13·26	13·78	13·68	12·86	11·34	9·88	8·86	8·16	8·03	8·46	9·64	10·86	12·06	12·78	12·56	11·57	9·92 / 8·17	6·67	5·98	6·16	7·20	8·87	72 6
69	10·76	12·70	14·08	14·61	14·06	12·53	10·68	8·96	7·55	6·88	7·05	8·07	9·84	11·76	12·97 / 13·54	13·03	11·46	9·42	7·27	5·74	5·30	5·90	7·44	9·66	73 7
70	11·92	14·02	15·17	15·16	13·87	11·66	9·44	7·56	6·34	6·07	6·86	8·68 / 10·80	12·96	14·26	14·55	13·37	11·16	8·45	6·26	5·16	5·12	6·24	8·10	10·63	74 8
71	13·22	15·15	15·86	15·17	13·22	10·40	7·86	6·06	5·25 / 5·54	6·90	9·24	11·72	13·95	15·20	15·12	13·39	10·64	7·57	5·44	4·44	4·96	6·46	8·94	11·85	75 9
Sum	744·23	739·16	754·05	784·12	808·42	804·42	808·31	804·33	784·12	751·65	752·78	755·05	728·04	746·40	757·16	763·36	772·71	782·34	789·32	778·15	760·31	756·70	734·90	722·80	No. of Days. 74d 10h.
No.	75	74	74	74	75	74	74	75	75	74	75	76	74	74	74	74	74	74	76	74	74	75	74	74	18382·83

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Series $2M_2K_1$.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	d h
72	14·34	16·00	16·06	14·53	11·64	8·54 5·76	4·22	3·97	5·24	7·30	10·10	13·02	15·04	16·00	15·20	12·86	9·54	6·67	4·92	4·38	5·52	7·55	10·33	13·50	76 10
73	15·75	16·73 16·07	13·66	10·42	7·22	4·92	3·64	4·00	5·66	8·33	11·52	14·30	16·06	16·52	15·06	12·13	8·73	6·13	4·66	4·99	6·52	8·92	11·86 14·66	16·40	77 12
74	16·56	15·07	11·90	8·47	5·62	3·74	3·22	4·26	6·60	9·60	12·85	15·23	16·56	16·25	14·26	10·83	8·00	5·75	5·11	5·88 7·84	10·46	13·38	15·68	16·60	78 13
75	15·80	13·36	10·12	7·06	4·83	3·54	3·76	5·34	7·86	11·00	13·93	15·92	16·74	15·74	13·36	10·24 7·64	6·12	6·08	7·14	9·00	11·56	13·90	15·66	15·98	79 14
76	14·76	12·06	8·90	6·13	4·34	3·62	4·36	6·06	8·47	11·31	13·87	15·62	16·12 14·97	12·74	10·02	8·05	6·96	7·06	7·93	9·67	12·07	14·08	15·23	15·08	80 15
77	13·57	11·16	8·26	6·08	4·76	4·47	5·46	7·26	9·48	11·88 13·90	15·36	15·50	14·66	12·67	10·54	8·74	7·94	8·14	9·06	10·62	12·40	13·77	14·52	14·20	81 16
78	12·80	10·64	8·47	6·76	5·86	5·82 6·49	7·75	9·52	11·71	13·54	14·73	14·90	14·06	12·63	11·05	9·70	8·86	8·72	9·12	10·24	11·76	13·06	13·60	13·34	82 17
79	12·06	10·56	8·92 7·40	6·43	6·30	6·68	7·68	9·46	11·24	13·02	14·08	14·52	14·22	13·04	11·70	10·34	9·24	8·84	9·04	9·84	10·96	12·05	12·86	12·96 12·44	83 19
80	11·22	9·67	8·30	7·00	6·48	6·64	7·48	8·86	10·64	12·34	13·74	14·48	14·44	13·62	12·12	10·36	8·96	8·11	7·96	8·44	9·76 11·26	12·36	12·92	12·78	84 20
81	11·94	10·50	8·78	7·20	6·06	5·92	6·72	8·34	10·26	12·20	13·86	15·00	15·14	14·16	12·20	9·88	8·00 6·90	6·56	7·46	9·22	11·16	12·56	13·57	14·06	85 21
82	13·37	11·72	9·38	7·17	5·72	5·38	6·17	7·82	10·00	12·50	14·54	15·84	15·94	14·64 12·14	9·36	6·97	5·74	5·63	6·67	8·88	11·24	13·46	14·86	15·36	86 22
83	14·34	12·05	9·44	6·93	5·38	5·00	5·82	7·83	10·50	13·30	15·60 16·72	16·28	14·37	11·37	8·36	6·00	4·67	4·80	6·40	9·20	12·06	14·62	16·12	16·16	87 23
84	14·90	12·22	9·12	6·60	5·05	4·86	5·87 8·10	11·14	14·15	16·35	17·15	16·24	13·58	10·14	7·06	4·83	3·96	4·70	6·72	9·92	13·20	15·64	17·04	16·75	89 0
85	14·92	11·81	8·56	6·27 5·14	5·64	6·94	9·43	12·61	15·44	17·03	17·08	15·36	11·92	8·64	6·18	4·48	4·25	5·24	7·57	11·00	14·10	16·43	17·34	16·56	90 1
86	14·28 10·82	7·84	5·95	5·42	6·12	7·87	10·62	13·66	16·10	17·14	16·46	13·96	10·44	7·12	4·80	3·83	4·41	6·43	8·78	12·04	14·74	16·66 17·13	15·64	12·86	91 3
87	9·53	7·16	5·81	5·93	7·22	9·26	12·02	14·66	16·44	16·67	15·06	12·02	8·56	5·84	4·04	3·84	4·93	7·24 10·09	13·22	15·56	16·90	16·56	14·74	11·68	92 4
88	8·84	7·02	6·48	7·04	8·26	10·50	13·00	14·94	15·83	15·12	12·94	9·87	7·14	5·16	4·22 4·76	6·40	8·73	11·37	14·00	15·82	16·34	15·34	13·10	10·40	93 5
89	8·36	7·32	7·28	8·03	9·50	11·53	13·48	14·74	14·92	13·67	11·34	8·76 6·67	5·40	5·22	6·16	7·85	9·97	12·30	14·30	15·48	15·46	14·27	12·24	10·20	94 6
90	8·78	8·26	8·47	9·24	10·52	12·04	13·48	14·16 13·84	12·27	10·16	8·14	6·47	5·74	6·22	7·44	9·20	10·85	12·64	14·05	14·67	14·27	12·97	11·44	10·04	95 7
91	9·16	8·84	9·16	9·84	10·95 11·96	12·80	12·96	12·28	10·94	9·24	7·80	6·78	6·70	7·30	8·37	9·54	10·90	12·34	13·52	13·80	13·26	12·13	10·96	10·04	96 8
92	9·60	9·33 9·54	9·90	10·56	11·44	11·92	12·05	11·54	10·36	9·16	8·12	7·47	7·44	7·87	8·52	9·46	10·73	11·93	12·74	12·98	12·60	11·86	11·07 10·34	9·94	97 10
93	9·77	9·87	10·02	10·36	10·81	11·14	11·27	10·92	10·30	9·34	8·36	7·74	7·58	7·98	8·76	9·87	11·04	11·96	12·50 12·66	12·42	11·96	11·34	10·55	9·91	98 11
94	9·47	9·34	9·52	9·94	10·53	10·94	11·12	11·02	10·62	10·00	9·22	8·40	8·01	8·13	8·63	9·70 10·66	11·77	12·66	13·06	12·94	12·40	11·47	10·50	9·62	99 12
95	8·94	8·54	8·74	9·48	10·45	11·36	11·88	11·89	11·44	10·50	9·40	8·46	7·84 7·76	8·43	9·46	10·86	12·30	13·36	13·82	13·66	12·66	11·42	10·02	8·72	100 13
96	7·96	7·82	8·36	9·47	10·86	11·90	12·70	12·87	12·44 11·06	9·52	8·12	7·40	7·47	8·26	9·54	11·08	12·70	14·06	14·56	14·22	12·80	10·96	8·88	7·46	101 14
97	6·81	6·84	7·92	9·62	11·52	13·00 13·97	14·12	13·00	11·02	9·05	7·48	6·74	6·92	7·97	9·72	11·72	13·58	14·86	15·12	14·21	12·35	9·67	7·47	5·98	102 15
98	5·58	6·14	7·76 9·84	12·16	14·02	15·18	15·06	13·40	10·95	8·28	6·66	6·02	6·46	7·88	10·06	12·53	14·55	15·72	15·49	13·80	11·08	8·22	5·93 4·52	4·32	103 17
99	5·47	7·72	10·54	13·27	15·36	16·20	15·32	13·00	9·88	7·34	5·76	5·40	6·24	8·22	10·70	13·40	15·52	16·25	15·36	12·80 9·46	6·56	4·47	3·42	3·91	104 18
100	5·74	8·31	11·40	14·40	16·28	16·72	15·47	12·68	9·44	6·81	5·47	5·38	6·52	8·91	11·80	14·40	15·97 16·08	14·35	11·30	7·80	4·97	2·93	2·46	3·76	105 19
101	6·21	9·51	12·97	15·58	17·14	17·04	14·94	11·68	8·36	6·14	5·06	5·57	7·24	10·07 13·10	15·40	16·44	15·82	13·44	9·7[illegible]	6·67	4·03	2·50	2·77	4·44	106 20
102	7·50	10·96	14·33	16·70	17·72	16·91	14·37	10·87	8·10	6·15 5·71	6·50	8·36	11·33	14·12	15·97	16·50	15·10	12·22	8·67	5·24	3·17	2·56	3·47	5·74	107 21
103	8·64	12·02	15·12	16·94	17·54	16·24	13·40 10·32	7·62	6·17	6·07	7·04	9·13	12·00	14·47	15·69	15·54	13·66	10·74	7·44	4·88	3·28	3·04	4·36	6·67	108 22
104	9·40	12·47	15·00	16·74 16·94	15·60	13·03	10·01	7·87	6·76	6·80	7·71	9·70	12·14	14·15	15·02	14·50	12·53	9·92	7·24	5·36	4·17	4·16	5·20	7·26 9·89	110 0
105	12·40	14·57	15·77	15·74	14·47	12·12	9·90	8·07	7·14	7·11	7·83	9·54	11·58	13·16	13·74	13·28	11·76	9·56	7·60	5·96	4·93 5·02	5·86	7·52	9·74	111 1
106	12·00	13·87	14·87	14·77	13·76	12·06	10·26	8·74	7·82	7·54	8·00	9·34	11·00	12·36	12·96	12·72	11·58	10·14 8·48	6·94	6·06	5·96	6·60	7·87	9·72	112 2

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108	11·42	13·00	14·07	14·44	13·93	12·76	11·00	9·18	7·74	6·96	6·96 7·85	9·40	10·96	12·36	13·06	13·12	12·22	10·65	8·87	7·52	6·74	6·84	7·66	9·26	114 4
109	11·04	12·88	14·12	14·66	14·30	12·64	10·64	8·60 6·78	5·94	5·93	7·08	9·00	11·04	12·64	13·72	13·87	12·97	11·36	9·32	7·66	6·62	6·47	7·28	8·88	115 5
110	10·96	12·96	14·54	15·17	14·54 12·77	10·22	7·74	5·76	4·88	5·14	6·58	8·88	11·33	13·36	14·66	14·94	13·86	11·70	9·34	7·26	6·22	6·20	7·24	9·00	116 6
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113	14·64	15·66	14·96	12·70	9·46	6·57	4·32	3·42	4·04	5·80	8·48	11·42	14·32	16·17	16·57	15·46 12·94	10·06	7·64	6·36	6·16	6·82	8·40	10·90	13·45	119 10
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115	15·04	15·06	12·96	9·73	7·17	4·24	3·42	4·04	5·68 8·27	10·68	13·46	15·48	16·25	15·62	13·50	10·52	8·22	6·72	6·40	7·02	8·34	10·44	12·60	14·08	121 12
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119	9·58	7·94	6·74	6·04	6·20	7·12	8·46	10·24	12·10	13·38	14·08	13·92	12·90	11·41	10·00	8·90	8·46 8·56	9·00	9·74	10·55	11·36	11·86	11·68	10·52	125 17
120	9·26	7·86	6·96	6·92	7·44	8·22	9·26	10·47	12·10	13·34	13·78	13·40	12·16 10·87	9·94	9·24	8·96	8·94	9·17	9·58	10·34	10·96	11·44	11·34	10·58	126 18
121	9·56	8·46	7·76	7·66	7·97	8·66	9·74	10·97	12·22	13·24 13·54	13·24	12·12	10·96	9·98	9·27	8·94	8·74	8·80	9·24	10·03	10·80	11·26	11·29	10·79	127 19
122	10·06	9·26	8·46	8·06	8·04	8·56	9·72 10·94	12·20	12·96	13·22	12·94	12·14	11·17	9·96	8·96	8·20	7·92	8·00	8·62	9·56	10·46	11·34	11·77	11·44	128 20
123	10·76	9·74	8·78 8·17	8·10	8·66	9·60	10·93	12·30	13·21	13·50	13·18	12·36	11·16	9·68	8·30	7·26	6·90	7·45	8·52	10·00	11·40	12·36	12·92	12·66 11·62	129 22
124	10·20	8·85	8·06	7·83	8·24	9·37	10·96	12·50	13·57	14·02	13·54	12·37	10·74	8·97	7·34	6·24	5·98	6·71	8·26	10·20	12·12 13·50	14·22	13·67	12·20	130 23
125	10·16	8·55	7·53	7·27	7·93	9·36	11·30	13·16	14·26	14·66	13·94	12·24	9·97	7·60	5·85	4·92	5·06 6·42	8·60	10·95	13·28	14·84	15·34	14·46	12·38	132 0
126	10·01	8·14	6·95	6·90	8·01	9·74	11·84	13·66	14·84	15·16	14·10	11·76	8·83	6·14 4·18	3·66	4·53	6·46	9·08	11·92	14·30	15·96	16·28	14·95	12·41	133 1
127	9·36	7·14	6·17	6·50	7·92	10·02	12·44	14·46	15·64	15·47	13·76 10·66	7·20	4·46	2·86	2·74	4·17	6·63	9·77	13·00	15·72	17·16	16·96	15·18	11·90	134 2
128	8·78	6·57	5·95	6·52	7·94	10·30	12·84	15·02 15·97	15·24	12·56	8·86	5·70	3·17	1·97	2·43	4·23	7·22	10·62	13·96	16·50	17·69	17·06	14·58	10·90	135 3
129	8·02	5·94	5·46	6·30 8·25	10·90	13·74	15·64	16·06	14·62	11·54	7·86	4·52	2·14	1·42	2·56	5·03	8·20	11·45	14·68	16·97	17·83	16·77	14·06	10·36	136 4
130	7·60 5·84	5·52	6·20	8·20	11·20	14·02	15·72	15·74	13·76	10·48	6·92	4·07	2·24	1·86	3·24	5·60	8·58	12·24	15·14	17·16	17·74	16·33 13·21	10·00	7·30	137 6
131	5·76	5·60	6·58	8·80	11·97	14·34	15·47	15·07	12·82	9·66	6·56	4·08	2·67	2·88	4·46	6·78	9·71	12·92 15·50	17·10	17·16	15·40	12·67	9·57	7·36	138 7
132	6·16	6·11	7·20	9·40	12·06	14·14	14·98	14·36	12·18	9·28	6·58	4·76	3·86	4·30	5·66 7·78	10·44	13·15	15·36	16·54	16·23	14·86	11·94	9·56	7·54	139 8
133	6·48	6·38	7·36	9·30	11·76	13·38	13·98	13·42	11·66	9·36	7·30	5·74 4·98	5·26	6·33	8·08	10·42	12·87	14·66	15·72	15·46	14·00	11·78	9·46	7·72	140 9
134	6·96	6·82	7·44	8·91	10·74	12·30	13·13	12·92	11·76 10·08	8·18	6·84	6·28	6·46	7·26	8·54	10·38	12·48	14·22	14·94	14·74	13·52	11·62	9·46	7·84	141 10
135	6·86	6·52	6·83	8·02	9·54 11·12	12·28	12·53	12·07	10·86	9·35	7·86	6·87	6·74	7·36	8·54	10·16	11·86	13·27	14·14	13·98	12·92	11·14	9·14	7·48	142 11
136	6·36	5·86 5·93	7·12	8·94	10·74	12·22	12·86	12·65	11·60	10·06	8·56	7·47	7·24	7·70	8·44	10·00	11·62	13·06	13·93	13·82	12·68	10·82	9·01 7·20	5·72	143 13
137	5·17	5·56	6·97	8·92	10·90	12·46	13·44	13·42	12·46	10·72	9·12	8·02	7·47	7·63	8·26	9·76	11·56	13·14	14·05 13·96	12·62	10·76	8·52	6·66	5·32	144 14
138	4·84	5·46	7·38	9·67	11·66	13·40	14·34	14·36	13·24	11·36	9·64	8·16	7·52	7·50	8·44	10·16 11·93	13·46	14·20	13·97	12·62	10·50	7·84	5·72	4·46	145 15
139	4·54	5·90	7·82	10·17	12·67	14·36	15·22	14·76	13·34	11·12	9·16	7·84	7·36 7·72	8·72	10·32	12·06	13·66	14·36	13·76	11·92	9·27	6·82	4·82	3·97	146 16
140	4·57	6·16	8·40	11·03	13·46	15·10	15·52	14·67	12·94	10·67 8·77	7·60	7·38	7·93	9·10	10·86	12·73	14·28	14·53	13·00	10·66	7·86	5·58	4·22	4·13	147 17
141	5·24	7·24	9·70	12·30	14·40	15·74 15·70	14·12	12·14	9·74	8·36	7·64	7·54	8·20	9·70	11·80	13·62	14·54	14·16	12·22	9·68	6·84	4·84	3·94	4·50	148 18
142	6·00	8·33	10·94 13·60	15·42	16·13	15·62	13·90	11·47	9·28	7·84	7·40	7·74	8·92	10·62	12·60	14·02	14·27	13·22	10·78	8·10	5·76	4·27	4·17	5·26 7·20	149 20
Sum	746·70	739·98	726·62	724·56	746·21	771·16	768·42	786·97	780·20	786·85	773·81	755·51	762·78	743·93	735·57	759·25	758·79	767·70	781·15	785·47	792·32	798·43	796·12	768·59	No. of Days.
																									74d 11h.
No.	74	75	75	74	74	76	74	74	74	75	74	74	75	74	74	75	75	74	74	74	74	74	76	75	18357·09

FORMS FOR SHORT-PERIOD TIDES.

SERIES $2M_2K_1$.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
143	9·70	12·28	14·66	15·94	16·04	14·86	12·64	10·27	8·44	7·54	7·34	8·10	9·52	11·55	13·36	14·27	13·92	12·06	9·48	6·90 5·12	4·32	4·97	6·54	8·70	150 21
144	11·00	13·46	15·32	16·07	15·67	14·17	11·77	9·56	8·16	7·68	7·83	8·74	10·50	12·26	13·66	14·02	12·96 10·86	8·34	6·24	5·04	4·82	5·84	7·60	9·46	151 22
145	11·87	14·10	15·30	15·60	14·66	12·78	10·74	9·03	7·96	7·73	8·24	9·44	11·07	12·62 13·44	13·16	11·96	9·94	7·67	6·16	5·18	5·56	6·86	8·64	10·66	152 23
146	12·74	14·30	15·12	15·06	13·65	11·84	10·00	8·46	7·75	7·78 8·46	9·92	11·36	12·37	12·84	12·22	10·98	9·18	7·32	6·03	5·94	6·87	8·17	9·67	11·58	154 0
147	13·28	14·64	14·97	14·22	12·62	11·08	9·47 8·38	8·08	8·30	9·20	10·24	11·40	12·12	12·46	11·72	10·38	8·77	7·37	6·70	6·93	7·78	8·83	10·30	11·90	155 1
148	13·54	14·68	14·80	13·77 12·16	10·50	9·20	8·47	8·28	8·60	9·36	10·36	11·26	11·83	12·05	11·56	10·60	9·20	8·14	7·72	7·83	8·62	9·82	11·10	12·64	156 2
149	13·94 14·46	14·16	13·26	11·74	10·42	9·26	8·54	8·34	8·46	9·23	10·10	10·93	11·70	11·97	11·72	11·06	9·98	8·86	8·32	8·36	9·00 10·04	11·54	12·92	13·86	157 4
150	14·25	13·85	12·88	11·48	10·08	8·98	8·20	8·20	8·37	9·12	10·03	11·29	12·14	12·58	12·36	11·84	11·02	10·06 9·23	8·78	9·20	10·37	11·98	13·44	14·22	158 5
151	14·34	13·94	12·86	11·59	10·03	8·74	7·92	7·54	7·76	8·67	9·96	11·54	12·84	13·87	13·86 13·28	12·03	10·56	9·66	9·64	10·17	11·38	12·77	13·98	14·67	159 6
152	15·14	14·88	13·86	12·46	10·48	8·82	7·82	7·50	8·19	9·46	11·28 13·22	14·76	15·82	15·76	14·97	13·34	11·70	10·67	10·27	10·56	11·52	12·90	14·12	15·30	160 7
153	15·65	15·48	14·17	12·02	9·86	8·00	7·09	6·85 7·72	9·34	11·40	13·77	15·84	16·86	16·85	15·70	13·60	11·52	9·95	9·55	9·80	10·84	12·57	14·21	15·47	161 8
154	16·06	15·22	13·50	10·84	8·22 6·16	4·95	5·15	6·50	8·61	11·37	14·18	16·48	17·54	17·17	15·60	12·50	10·07	8·34	8·17	8·96	10·27	12·23	14·24	15·74	162 9
155	16·29	15·33 12·77	9·46	6·32	4·44	3·62	4·30	6·30	8·54	11·95	15·02	17·28	17·95	17·20	15·02	11·76	9·04	7·44	7·22	7·81	9·55	12·08 14·54	16·07	16·21	163 11
156	14·76	11·87	8·16	5·07	3·07	2·74	3·80	5·94	9·24	12·80	15·92	18·07	18·53	17·65	14·65	10·90	8·00	6·62	6·55 7·50	9·65	12·45	14·89	16·40	16·14	164 12
157	14·28	10·90	7·10	4·31	2·62	2·37	3·68	6·30	9·76	13·48	16·44	18·12	18·40	17·00	13·80	10·17 7·55	6·20	6·18	7·30	9·60	12·79	15·16	16·42	15·96	165 13
158	13·80	10·33	6·77	4·00	2·33	2·54	4·18	7·11	10·40	13·95	16·74	17·85 17·95	16·07	12·81	9·60	7·05	5·72	5·77	7·00	9·56	12·80	15·12	16·05	15·26	166 14
159	12·76	9·20	6·14	3·95	2·88	3·47	5·52	7·93	11·04 14·21	16·44	17·72	17·40	15·44	12·07	9·02	6·70	5·67	5·93	7·41	10·07	13·02	14·92	15·57	14·68	167 15
160	12·28	9·20	6·52	4·77	4·20	4·94 6·52	8·80	11·67	14·34	16·42	17·20	16·60	14·54	11·30	8·66	6·74	6·05	6·16	7·65	10·05	12·50	14·32	14·85	14·05	168 16
161	11·96	9·47	7·26 6·06	5·80	6·39	7·66	9·64	11·92	14·25	15·90	16·46	15·74	13·76	10·84	8·61	6·86	6·32	6·58	7·80	9·82	12·04	13·55	14·17 13·54	12·03	169 18
162	10·34	8·60	7·57	7·26	7·62	8·44	9·92	12·12	14·20	15·46	15·54	14·58	12·66	10·40	8·31	7·04	6·60	6·77	7·78	9·32 11·22	12·80	13·58	13·46	12·40	170 19
163	10·90	9·62	8·66	8·31	8·49	9·03	10·30	12·04	13·70	14·74	14·75	13·73	12·02	10·10	8·46	7·12	6·53 6·70	7·50	9·03	10·90	12·32	13·20	13·38	12·92	171 20
164	11·94	10·67	9·60	8·94	8·82	9·24	10·33	11·90	13·24	14·06	14·10	13·34	11·84 10·05	8·26	6·94	6·44	6·67	7·49	9·06	10·86	12·50	13·66	14·10	13·63	172 21
165	12·46	11·06	10·06	9·30	9·05	9·33	10·22	11·60	12·90	13·82 13·85	13·08	11·64	9·76	8·00	6·70	6·08	6·22	7·28	9·00	10·94	12·77	14·05	14·63	14·17	173 22
166	12·86	11·33	10·04	9·14	8·86	9·20	10·08 11·26	12·44	13·30	13·52	12·80	11·00	8·85	7·06	5·67	5·05	5·60	7·15	9·26	11·30	13·28	14·45	14·84	13·95	174 23
167	12·40	10·90	9·46	8·62 8·24	8·56	9·64	11·12	12·55	13·40	13·37	12·07	10·07	8·20	6·17	4·94	4·74	5·62	7·74	9·76	12·14	14·01	15·00	14·86	13·77 12·06	176 1
168	10·27	8·84	8·10	7·94	8·52	9·68	11·18	12·64	13·37	13·05	11·52	9·17	6·76	5·11	4·16	4·64	6·10	8·00	10·50	12·90	14·56 15·33	14·70	13·32	11·14	177 2
169	9·44	8·17	7·54	7·57	8·34	9·81	11·65	13·20	13·60	12·56	10·40	7·97	5·83	4·38	4·04	4·96	6·82	9·02 11·57	13·86	15·24	15·44	14·56	12·56	10·36	178 3
170	8·63	7·62	7·30	7·74	8·86	10·67	12·47	13·67	13·60	12·02	9·66	6·93	4·96	3·94 4·22	5·70	7·84	10·40	12·82	14·74	15·56	15·33	13·80	11·44	9·35	179 4
171	7·79	7·04	7·03	7·90	9·44	11·66	13·22	13·92	13·00	10·74	8·00 5·64	4·04	3·83	4·76	6·70	9·02	11·37	13·67	15·12	15·46	14·48	12·44	9·96	8·16	180 5
172	6·86	6·42	6·94	8·42	10·44	12·57	13·67	13·68 12·22	9·64	6·86	4·96	3·98	4·36	5·65	7·72	10·02	12·26	14·31	15·28	15·12	13·77	11·30	9·01	7·37	181 6
173	6·64	6·56	7·46	9·06 11·01	12·70	13·51	13·01	11·07	8·44	6·12	4·72	4·42	5·32	6·94	8·97	11·17	13·22	14·74	15·17	14·22	12·16	9·74	7·86	6·74	182 7
174	6·51 7·07	8·16	9·92	11·66	12·82	13·10	11·86	9·72	7·36	5·70	5·02	5·24	6·42	8·07	10·12	11·98	13·73	14·86	14·72	13·40	11·17	9·22 7·55	6·51	6·57	183 9
175	7·34	8·72	10·61	12·04	12·77	12·64	11·27	9·34	7·48	6·30	5·87	6·54	7·66	9·24	10·97	12·94	14·38	14·88	14·20 12·50	10·34	8·44	7·22	6·77	6·97	184 10
176	7·87	9·34	10·94	12·19	12·66	12·22	10·84	9·25	7·90	6·96	6·92	7·56	8·50	10·00	11·48 13·23	14·36	14·44	13·38	11·42	9·60	8·02	6·94	6·56	6·92	185 11
177	7·79	9·26	10·80	11·92	12·43	12·16	11·12	9·70	8·48	7·63	7·56	8·14 9·04	10·41	11·98	13·30	13·98	13·72	12·51	10·84	8·96	7·47	6·70	6·48	6·84	186 12

178	7·86	9·16	10·52	11·71	12·36	12·28	11·46	10·38	9·16 8·34	8·14	8·38	9·04	10·37	11·82	13·16	13·66	13·27	11·87	10·24	8·57	7·05	6·14	5·87	6·26	187 13
179	7·22	8·72	10·36	11·70	12·56 12·86	12·14	11·14	9·86	8·86	8·32	8·34	9·02	10·46	11·88	13·12	13·48	12·96	11·86	10·30	8·58	7·00	5·74	5·32	5·74	188 14
180	6·86	8·67 10·62	12·30	13·47	13·96	13·31	12·10	10·48	9·04	8·28	8·37	8·98	10·28	11·72	13·02	13·62	13·24	12·02	10·14	8·20	6·16	4·76	4·31 4·90	6·40	189 16
181	8·62	10·94	13·04	14·57	15·22	14·64	12·87	10·58	8·66	7·68	7·62	8·40	10·00	11·70	13·12	13·97	13·69	12·32	10·27	7·76 5·44	3·88	3·19	3·88	5·80	190 17
182	8·60	11·46	13·90	15·54	16·06	15·08	12·92	10·40	8·23	7·07	6·90	7·82	9·54	11·60	13·35	14·38 14·34	12·76	10·16	7·15	4·46	2·56	2·27	3·49	5·92	191 18
183	8·80	12·36	15·04	16·76	17·06	15·90	13·27	10·08	7·42	6·03	6·04	7·17	9·30 11·84	13·92	15·05	14·90	13·08	9·91	6·43	3·53	1·84	1·84	3·58	6·20	192 19
184	9·54	13·00	15·92	17·60	17·55	15·88	12·54	9·04	6·46	5·24 5·54	6·76	9·24	12·48	14·76	16·12	15·46	13·17	9·32	5·65	2·96	1·56	1·90	3·97	6·70	193 20
185	10·13	13·94	16·80	18·22	17·87	15·72 12·00	8·47	5·86	4·66	4·98	6·66	9·72	13·12	15·46	16·44	15·54	12·76	8·60	5·17	2·76	1·62	2·37	4·50	7·60	194 21
186	11·14	14·80	17·30 18·38	17·46	14·77	11·14	7·30	5·12	4·24	4·66	6·66	9·96	13·24	15·56	16·37	15·10	12·10	8·47	5·36	3·22	2·47	3·46	5·71	8·66 12·13	195 23
187	15·36	17·38	17·97	16·76	13·80	10·58	7·04	4·79	4·26	5·04	7·14	10·42	13·85	15·77	16·14	14·53	11·60	8·45	5·84	4·20	3·82 5·12	6·97	9·80	13·00	197 0
188	15·56	17·04	17·17	15·44	12·60	9·26	6·86	5·22	4·84	5·76	8·06	10·85	13·97	15·36	15·40	13·86	11·04 8·20	6·43	5·40	5·54	6·64	7·95	10·24	12·80	198 1
189	15·30	16·34	15·86	14·11	11·28	8·50	6·30	5·34	5·40	6·24	8·00	10·50	12·97	14·30 14·44	12·94	10·92	9·08	7·74	7·24	7·56	8·14	9·16	11·11	13·10	199 2
190	14·71	15·40	14·72	12·96	10·60	8·38	6·86	5·92	6·05	6·82	8·26 10·28	12·30	13·38	13·40	12·62	11·34	10·16	9·24	8·58	8·59	8·86	9·62	10·96	12·55	200 3
191	13·78	14·07	13·40	11·92	10·10	8·37	6·87 6·38	6·51	7·24	8·41	9·82	11·28	12·52	12·90	12·68	11·87	10·93	10·01	9·34	9·14	9·27	9·97	10·90	12·12	201 4
192	13·14	13·41	12·71	11·34 9·77	8·47	7·34	6·76	6·86	7·36	8·56	10·06	11·46	12·50	13·02	12·96	12·57	11·86	10·96	10·04	9·53	9·52	9·76	10·73	11·74	202 5
193	12·78 13·04	12·50	11·42	10·20	8·76	7·52	6·90	6·76	7·25	8·50	10·20	11·86	13·24	13·87	13·87	13·28	12·22	11·04	10·07	9·54	9·50 9·87	10·64	11·70	12·60	203 7
194	12·94	12·66	11·70	10·10	8·56	7·16	6·24	6·28	7·14	8·62	10·44	12·07	13·40	14·20	14·14	13·28	12·08	10·74 9·52	8·94	8·94	9·48	10·50	11·72	12·63	204 8
195	13·06	12·60	11·28	9·36	7·66	6·38	5·86	6·06	7·07	8·94	10·96	13·07	14·58	15·07	14·54 13·34	11·84	10·26	9·14	8·46	8·46	9·16	10·36	11·74	13·14	205 9
196	13·52	12·81	11·24	9·13	7·31	5·74	5·33	6·10	7·65	9·76	12·02	14·00 15·20	15·33	14·58	12·97	11·01	9·35	8·37	8·18	8·73	9·62	10·95	12·64	13·76	206 10
197	13·92	12·56	10·36	8·02	6·14	5·26	5·24	6·52 8·36	10·60	12·96	14·83	16·05	15·68	14·35	12·14	9·94	8·56	8·04	8·20	8·78	9·99	11·82	13·73	14·66	207 11
198	14·04	11·84	8·90	6·50	5·04 4·74	5·78	7·22	9·33	11·77	14·22	15·86	16·07	15·15	13·18	10·77	8·67	7·57	7·18	7·78	8·96	10·77	12·83	14·27	14·50	208 12
199	13·28	10·70 7·76	5·53	4·56	4·86	6·26	8·20	10·44	13·14	15·37	16·51	16·11	14·47	11·94	9·36	7·58	6·88	7·16	8·00	9·72	11·80	13·84 14·90	14·32	12·37	209 14
200	9·57	6·78	5·10	4·56	5·42	7·13	9·26	11·96	14·36	15·96	16·14	15·17	12·96	10·25	8·01	6·67	6·34	6·89	8·16 10·14	12·46	14·24	14·84	13·50	10·90	210 15
201	8·02	5·86	4·76	5·04	6·52	8·34	10·66	13·15	15·27	16·14	15·82	14·14	11·47	8·96	7·02	6·16 6·33	7·34	9·23	11·44	13·54	14·58	14·24	12·42	9·84	211 16
202	7·44	5·64	5·14	5·97	7·54	9·60	11·76	13·95	15·50	15·83	14·93	12·72	10·10 7·72	6·16	5·77	6·54	7·96	9·86	12·04	13·74	14·37	13·56	11·51	8·97	212 17
203	7·02	5·96	5·96	7·12	8·61	10·53	12·64	14·44	15·55 15·26	13·84	11·46	8·86	6·95	5·97	6·05	7·05	8·56	10·54	12·48	13·67	13·96	12·84	10·98	9·00	213 18
204	7·60	6·88	7·24	8·26	9·66	11·37 13·15	14·57	15·10	14·32	12·72	10·34	8·27	6·67	6·12	6·40	7·34	8·74	10·52	12·26	13·26	13·32	12·36	10·84	9·38	214 19
205	8·24	7·77	8·12 8·86	10·16	11·76	13·33	14·29	14·38	13·46	11·64	9·64	7·76	6·48	6·10	6·50	7·54	9·00	10·63	12·05	12·96	13·18	12·64	11·47 10·24	9·16	215 21
206	8·76	9·04	9·66	10·72	12·02	13·24	14·10	14·04	13·02	11·29	9·63	7·96	6·84	6·50	6·73	7·66	9·04	10·52	12·10	13·14 13·55	13·28	12·50	11·34	10·26	216 22
207	9·52	9·35	9·67	10·59	11·83	12·88	13·62	13·44	12·54	11·15	9·50	7·86	6·50	5·94	6·16	7·10	8·50 10·20	11·94	13·44	14·14	14·16	13·42	12·16	10·76	217 23
208	9·56	9·05	9·15	9·96	11·33	12·62	13·38	13·55	12·96	11·68	9·90	7·96	6·26	5·30 5·46	6·46	8·25	10·24	12·44	14·18	15·26	15·50	14·64	12·94	10·78	219 0
209	9·16	8·56	8·76	9·78	11·16	12·57	13·70	14·26	14·02	12·80 10·52	8·01	5·84	4·76	4·81	5·98	7·77	10·32	13·02	15·24	16·66	16·76	15·58	13·24	10·54	220 1
210	8·38	7·60	7·78	8·76	10·54	12·56	14·24 15·18	14·86	13·21	10·40	7·41	4·97	3·62	3·84	5·16	7·44	10·44	13·54	16·14	17·54	17·44	15·84	12·90	9·72	221 2
211	7·44	6·60	6·85	8·10 10·22	12·92	15·15	16·26	15·72	13·66	10·33	6·96	4·40	3·04	3·33	5·32	7·86	11·08	14·56	17·20	18·37	18·04	16·16	12·38	8·82 6·46	222 4
212	5·54	5·95	7·72	10·60	13·60	16·07	17·04	16·38	13·96	10·25	6·47	3·74	2·56	3·20	5·12	8·18	11·74	15·30	17·66	18·50	17·76 14·76	10·60	7·27	5·06	223 5
Sum	808·66	798·15	780·79	781·47	737·80	732·60	734·46	726·08	747·26	764·39	768·96	797·78	794·03	795·31	784·24	748·72	733·38	713·58	719·04	743·99	787·44	791·33	798·15	801·88	No. of Days. 73d 9h.
No.	73	73	73	75	73	73	74	73	73	74	73	73	73	74	73	73	74	73	73	74	75	73	73	73	18389·49

FORMS FOR SHORT-PERIOD TIDES.

SERIES $2M_2K_1$.—(*Continued*).

Day	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	Solar Hour
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d h*
213	4·48	5·07	7·18	10·36	13·94	16·34	17·16	16·04	13·12	9·20	5·80	3·36	2·56	3·60	5·73	9·03	12·78	15·94 17·78	18·04	16·74	13·32	9·36	6·05	4·18	224 6
214	3·80	4·90	7·56	11·10	14·46	16·66	16·88	15·39	12·15	8·23	5·44	3·52	3·32	4·58	7·04 10·14	13·35	16·16	17·52	17·26	15·28	11·80	8·22	5·32	3·80	225 7
215	4·02	5·58	8·40	11·50	14·52	16·18	16·06	14·38	11·26	7·98	5·62 4·54	4·80	6·25	8·27	11·00	13·96	16·32	17·26	16·42	14·32	10·85	7·62	5·16	4·10	226 8
216	4·64	6·45	8·92	12·05	14·70	15·80	15·18	13·36 10·62	7·94	6·32	5·74	6·44	7·77	9·72	12·07	14·12	15·66	15·72	14·46	12·06	9·36	6·96	5·40	5·07	227 9
217	5·84	7·33	9·54	11·87	13·60 14·46	13·96	12·48	10·40	8·65	7·45	7·28	8·00	9·26	10·72	12·27	13·74	14·47	14·18	12·78	10·82	8·78	6·78	5·83	5·86	228 10
218	6·74 8·34	10·14	12·02	13·26	13·57	12·85	11·76	10·70	9·74	9·12	8·90	9·34	10·06	10·94	12·10	12·88	13·72	13·38	11·88	10·06	8·17	7·02 6·68	7·00	7·70	229 12
219	8·77	10·10	11·44	12·33	12·66	12·46	12·00	11·36	10·62	10·07	9·67	9·77	10·12	10·82	11·54	12·43	12·67	12·12	11·23 9·96	8·64	7·77	7·46	7·69	8·30	230 13
220	9·04	10·10	11·17	12·34	12·90	12·90	12·34	11·72	11·15	10·62	10·30	10·00	10·14	10·50	11·34 11·96	12·26	11·97	11·38	10·53	9·44	8·35	7·66	7·57	8·12	231 14
221	9·06	10·48	11·57	12·72	13·42	13·56	13·18	12·30	11·45	10·72	10·26	9·92 9·63	10·00	10·71	11·62	12·32	12·18	11·42	10·36	9·08	8·15	7·53	7·24	7·70	232 15
222	8·54	9·82	11·43	12·72	13·64	13·66	13·26	12·36	11·22 10·18	9·34	8·97	9·08	9·88	10·76	11·64	12·26	12·35	11·85	10·40	8·78	7·36	6·44	6·28	7·14	233 16
223	8·37	10·20	11·94	13·38	14·40	14·54 13·58	12·17	10·70	9·34	8·82	8·84	9·26	10·00	11·16	12·50	13·30	13·42	12·06	10·16	8·40	6·86	6·06	6·14	7·20	234 17
224	8·95	10·80 12·76	13·96	14·91	14·84	13·64	11·84	9·97	8·77	8·36	8·48	8·96	10·06	11·56	13·12	13·97	13·64	12·06	9·70	7·27	5·96	5·56	6·35 7·80	9·76	235 19
225	11·70	13·66	15·10	15·46	14·62	12·86	10·57	8·64	7·46	7·31	7·76	8·84	10·72	12·64	14·21	14·62	13·44	11·00	8·24	6·24 5·17	5·36	6·54	8·54	10·66	236 20
226	13·00	15·02	15·96	15·50	14·08	11·60	8·97	7·34	6·70	6·84	7·80	9·62	11·70	13·76	14·95	14·67 12·76	10·00	7·37	5·56	4·97	5·74	7·38	9·36	11·94	237 21
227	14·36	16·04	16·27	15·32	13·08	10·11	7·72	6·36	6·10	6·94	8·63	10·83	13·20 15·21	15·71	14·43	11·89	8·54	6·26	4·97	5·06	6·36	8·22	10·64	13·40	238 22
228	15·80	16·62	16·16	14·21	11·38	8·34	6·35	5·46	5·74	7·13 9·22	11·84	14·36	15·71	15·48	13·64	10·66	7·60	5·70	4·96	5·70	7·24	9·54	12·02	14·56	239 23
229	16·24	16·56	15·34	12·80	9·60	7·06	5·50 5·18	5·94	7·72	10·28	13·04	15·14	15·90	14·88	12·52	9·63	7·07	5·74	5·64	6·67	8·36	10·62	13·17	15·30	241 0
230	16·38	15·97	14·06 11·04	8·16	6·11	5·05	5·41	6·72	8·83	11·26	13·77	15·36	15·38	14·00	11·50	8·72	6·86	5·97	6·34	7·52	9·30	11·47	13·80	15·46 15·84	242 2
231	14·77	12·44	9·37	7·06	5·37	4·85	5·64	7·12	9·24	11·64	13·96	15·06	14·75	13·17	10·76	8·64	7·30	6·86	7·44	8·64	10·38 12·36	14·06	15·24	15·10	243 3
232	13·64	11·26	8·61	6·50	5·32	5·38	6·34	7·85	9·86	11·96	13·64	14·58	14·07	12·68	10·68	8·97	8·02 7·81	8·36	9·26	10·60	12·24	13·73	14·44	13·86	244 4
233	12·25	10·02	8·06	6·46	5·62	5·78	6·47	7·80	9·63	11·38	12·97	13·74	13·44	12·44 11·04	9·83	8·84	8·57	8·87	9·67	10·67	11·96	13·06	13·46	13·08	245 5
234	11·68	9·86	8·26	6·87	6·17	6·26	7·02	8·17	9·66	11·26	12·55 13·37	13·57	12·94	11·92	10·73	9·67	9·16	9·18	9·63	10·54	11·48	12·46	12·92	12·66	246 6
235	11·74	10·42	8·87	7·44	6·44	6·21	6·66	7·76 9·20	10·76	12·36	13·54	14·05	13·67	12·68	11·26	10·02	9·22	8·90	9·14	9·86	10·86	12·02	12·84	12·98	247 7
236	12·36	11·16	9·57	7·60 6·24	5·63	5·97	7·17	8·80	10·66	12·80	14·28	14·96	14·74	13·66	11·85	10·04	8·66	8·02	8·14	9·04	10·38	12·00	13·14	13·74	248 8
237	13·40 12·04	10·04	7·64	5·76	4·78	5·02	6·24	8·16	10·78	13·20	15·04	15·98	15·74	14·33	11·96	9·30	7·37	6·55	6·70	8·06	9·98	12·06 13·93	14·86	14·44	249 10
238	12·80	10·18	7·37	5·17	3·90	4·03	5·50	7·96	10·88	13·80	16·04	17·04	16·46	14·44	11·04	8·24	6·27	5·15 5·63	7·24	9·64	12·52	14·74	15·98	15·46	250 11
239	13·29	9·94	6·63	4·34	3·17	2·53	5·38	8·20	11·40	14·56	16·82	17·44	16·36	13·83	9·98 6·70	4·46	3·84	4·58	6·80	10·06	13·28	15·76	16·64	15·75	251 12
240	12·94	9·26	6·06	3·66	2·67	3·72	5·66	8·70	12·20	15·53	17·33	17·53 15·87	12·42	8·56	5·32	3·44	3·17	4·55	7·26	10·87	14·22	16·50	17·05	15·47	252 13
241	12·37	8·44	5·52	3·48	3·10	4·46	6·74	9·94 13·47	16·22	17·47	17·02	14·77	10·84	7·23	4·52	3·00	3·30	5·07	8·06	11·72	14·94	16·86	16·90	14·94	253 14
242	11·54	8·00	5·38	3·90	4·20 5·52	7·95	11·06	14·30	16·51	17·04	15·88	12·99	9·17	5·97	3·70	2·94	3·94	6·16	9·14	12·45	15·42	16·68	16·10	13·81	254 15
243	10·56	7·46 5·47	4·87	5·60	7·04	9·54	12·25	14·81	16·16	16·06	14·44	11·07	7·87	5·34	3·84	3·92	5·16	7·43	10·36	13·44	15·47	16·04	14·92 12·66	9·98	255 17
244	7·74	6·47	6·36	7·02	8·54	10·58	12·80	14·58	15·36	14·73	12·52	9·86	7·17	5·31	4·44	5·02	6·44	8·50	11·04 13·56	14·79	14·77	13·46	11·46	9·44	256 18
245	8·00	7·36	7·56	8·36	9·51	11·10	12·60	13·73	13·94	12·90	11·02	8·73	6·90	5·70	5·63	6·34 7·60	9·36	11·36	13·14	13·88	13·60	12·43	10·94	9·64	257 19
246	8·76	8·44	8·70	9·18	9·95	10·88	12·06	12·76	12·71	11·64	9·87	8·26	7·04 6·44	6·67	7·34	8·36	9·74	11·16	12·22	12·70	12·20	11·38	10·60	9·88	258 20
247	9·34	9·16	9·13	9·34	9·87	10·66	11·30	11·62	11·37 10·56	9·48	8·44	7·52	7·14	7·33	7·86	8·66	9·84	10·90	11·62	11·97	11·87	11·54	11·08	10·42	259 21

248	9·92	9·60	9·42	9·54	9·86	10·24 10·70	10·91	10·80	10·34	9·74	9·06	8·35	7·72	7·46	7·67	8·44	9·64	10·73	11·52	11·88	12·06	11·88	11·53	10·97	260 22
249	10·23	9·48	9·04 9·01	9·38	10·01	10·64	11·05	11·18	10·94	10·46	9·52	8·56	7·74	7·42	7·64	8·34	9·42	10·67	11·65	12·46	12·82	12·62	12·04	10·96 9·85	262 0
250	8·96	8·54	8·42	8·86	9·64	10·44	11·23	11·67	11·60	10·92	9·74	8·36	7·26	6·68	6·86	7·74	9·24	10·86	12·34	13·24 13·55	13·17	12·08	10·64	9·21	263 1
251	8·06	7·54	7·74	8·74	9·92	11·30	12·38	12·82	12·42	11·17	9·62	7·86	6·55	6·10	6·54	7·88	9·68 11·56	13·16	14·03	14·06	13·18	11·60	9·86	8·07	264 2
252	6·97	6·64	7·14	8·38	10·20	11·92	13·16	13·44	12·50	10·70	8·70	6·90	5·75	5·50 6·36	8·04	10·20	12·32	13·87	14·64	14·36	12·87	10·73	8·45	6·71	265 3
253	5·90	6·17	7·29	9·02	11·07	13·02	14·14	14·04	12·68	10·30 7·96	6·07	5·14	5·48	6·87	9·06	11·46	13·68	15·18	15·37	14·28	12·24	9·67	7·34	5·74	266 4
254	5·30	6·12	7·84	9·97	12·54	14·50	15·33 14·46	12·23	9·34	6·94	5·36	4·94	5·94	8·06	10·08	12·62	14·76	15·76	15·26	13·46	10·67	7·88	5·74	4·48	267 5
255	4·66	6·00	8·44	11·24 13·97	15·67	15·66	14·20	11·46	8·47	6·20	4·97	5·22	6·65	8·86	11·54	14·06	15·76	16·07	14·86	12·14	9·06	6·37	4·56	3·93	268 6
256	4·93 6·93	9·67	12·77	15·34	16·35	15·80	13·61	10·52	7·73	5·58	4·88	5·77	7·56	10·04	12·74	14·90	15·94	15·62	13·71	10·64	7·47 5·10	3·54	3·83	5·50	269 8
257	7·97	11·14	14·16	16·01	16·37	15·04	12·33	9·34	6·97	5·54	5·42	6·51	8·50	11·14	13·77	15·60	15·98	14·86 12·14	8·87	6·16	4·30	3·67	4·60	6·44	270 9
258	9·03	12·27	14·84	16·21	15·96	14·09	11·42	8·56	6·75	5·80	6·17	7·42	9·65	12·22	14·26 15·46	15·24	13·48	10·57	7·65	5·42	3·96	4·06	5·34	7·30	271 10
259	9·97	12·69	14·83	15·87	15·16	13·24	10·76	8·47	7·04	6·68	7·20 8·44	10·38	12·56	14·16	14·83	14·05	12·07	9·24	7·02	5·32	4·44	4·61	5·87	7·97	272 11
260	10·37	13·07	14·81	15·06	14·13	12·37	10·44	8·86 7·87	7·56	7·92	8·94	10·67	12·44	13·74	13·97	12·81	10·83	8·83	7·10	5·78	5·25	5·76	6·66	8·34	273 12
261	10·76	12·86	14·16	14·44	13·68 12·40	10·86	9·52	8·53	8·21	8·56	9·40	10·68	12·08	13·04	13·08	11·93	10·54	9·05	7·64	6·61	6·06	6·30	7·07	8·81	274 13
262	10·63	12·30 13·68	14·16	13·66	12·66	11·46	10·12	9·18	8·77	8·56	9·10	10·17	11·30	12·30	12·61	12·14	11·16	9·92	8·44	7·14	6·37	6·38 7·34	8·76	10·57	275 15
263	12·10	13·44	13·92	13·88	13·56	12·37	11·18	9·72	8·32	7·60	7·94	9·26	10·84	12·04	12·52	12·48	11·98	11·16	9·77 7·94	6·58	6·06	6·50	7·97	9·84	276 16
264	11·56	13·26	14·17	14·66	14·52	13·27	11·34	9·06	7·37	6·82	7·46	8·74	10·60	12·11	13·20	14·04 13·84	12·76	10·92	8·58	6·74	5·94	6·30	7·68	9·72	277 17
265	11·97	13·90	15·26	15·99	15·54	13·97	11·26	8·63	6·70	5·98	6·37	7·97 10·25	12·66	14·44	15·38	15·04	13·48	11·07	8·36	6·38	5·47	5·87	7·36	9·62	278 18
266	12·14	14·54	16·28	16·98	16·37	13·80	10·49	7·50	5·61 5·14	5·74	7·77	10·54	13·45	15·71	16·85	16·30	14·16	10·84	7·77	5·85	5·07	5·66	7·50	9·87	279 19
267	12·74	15·25	16·92	17·15	15·62	12·54 8·66	5·94	4·14	3·96	5·28	7·85	11·15	14·38	16·70	17·32	16·33	13·48	9·84	7·20	5·47	4·98	5·96	7·74	10·58	280 20
268	13·66	16·26 17·40	16·86	14·56	10·89	7·40	4·72	3·37	3·98	5·86	8·86	12·43	15·47	17·34	17·64	16·26	12·76	9·26	6·56	5·24	5·38	6·54	8·77 11·76	14·62	281 22
269	16·82	17·12	15·72	12·71	9·14	6·06	3·77	3·17	4·42	6·67	9·72	13·44	16·25	17·55	17·22	15·06	11·70	8·40	6·26	5·44 6·06	7·47	10·01	12·74	15·12	282 23
270	16·37	16·06	14·21	11·04	7·42	4·80	3·12	3·62	5·50	8·04	11·13	14·40	16·50	17·22	16·16	13·58	10·36 7·77	6·24	6·04	6·91	8·53	10·52	13·06	15·02	284 0
271	15·64	14·36	11·93	8·64	6·01	4·31	3·47	4·52	6·20	8·94	11·94	14·56	16·24 16·32	14·74	12·13	9·47	7·47	6·58	6·90	7·84	9·30	11·26	13·26	14·41	285 1
272	14·26	12·74	10·35	7·88	5·80	4·44	4·58	5·92	7·85	10·30 12·70	14·67	15·54	15·01	13·36	11·14	9·11	7·80	7·42	7·74	8·64	10·04	11·80	13·04	13·64	286 2
273	13·06	11·36	9·07	7·14	5·84	5·47	6·20 7·44	9·04	10·97	13·06	14·36	14·36	13·40	11·82	10·44	9·16	8·44	8·24	8·54	9·26	10·30	11·46	12·12	12·22	287 3
274	11·46	10·00	8·37 7·08	6·36	6·44	7·32	8·34	9·60	11·24	12·72	13·46	13·28	12·32	11·06	10·10	9·27	8·97	8·94	9·08	9·61	10·14	11·01	11·52	11·46 10·73	288 5
275	9·52	8·47	7·66	7·41	7·56	8·04	8·76	9·91	11·17	12·30	12·88	12·66	11·92	11·04	10·37	9·76	9·36	9·12	9·08	9·27	9·86 10·44	10·68	10·66	10·30	289 6
276	9·78	9·22	8·56	8·06	7·74	8·02	8·86	10·06	11·16	12·02	12·40	12·34	12·06	11·48	10·82	9·97	9·24	8·77 8·68	8·96	9·55	10·22	10·70	10·88	10·82	290 7
277	10·57	10·03	9·26	8·44	7·90	8·07	8·80	9·84	10·90	11·78	12·36	12·58	12·54	12·07 11·12	9·97	8·90	8·23	8·12	8·56	9·27	10·10	10·90	11·50	11·78	291 8
278	11·53	10·67	9·30	8·14	7·56	7·77	8·55	9·74	11·07	12·15	12·94 13·28	13·04	12·24	10·77	9·14	7·88	7·18	7·36	8·12	9·26	10·62	11·94	12·78	12·88	292 9
279	12·06	10·48	8·86	7·70	7·28	7·65	8·65	10·02 11·54	12·81	13·77	14·04	13·50	12·16	10·00	8·34	6·96	6·50	6·88	7·96	9·76	11·52	13·07	13·96	13·77	293 13
280	12·48	10·52	8·76	7·36 6·77	7·26	8·52	10·36	12·17	13·66	14·56	14·48	13·40	11·12	8·84	6·87	5·64	5·46	6·30	8·06	10·30	12·80	14·34	15·00	14·16	294 11
281	12·26 9·96	7·92	6·50	6·22	7·10	8·82	10·86	13·12	14·54	15·07	14·56	12·60	9·98	7·47	5·46	4·56	4·96	6·60	9·03	11·80	14·15	15·84 15·96	14·52	12·00	295 13
282	9·24	7·24	6·16	6·40	7·67	9·66	11·93	14·14	15·62	15·76	14·36	11·76	8·61	6·02	4·24	3·86	5·14	7·32	10·15 13·10	15·67	16·78	16·26	14·16	11·00	296 14
283	8·32	6·36	5·84	6·47	8·16	10·16	12·84	15·02	16·10	15·46	13·28	9·87	6·84	4·45	3·04 3·57	5·44	8·15	11·37	14·60	16·81	17·35	16·28	13·64	10·44	297 15
Sum	785·38	797·35	772·13	759·62	757·78	748·47	731·42	757·51	741·65	758·63	790·11	803·85	812·49	799·41	802·83	774·35	747·43	747·90	737·77	719·36	728·56	759·18	766·50	785·59	No. of Days. 74^{d} 10^{h}.
No.	75	75	74	74	74	74	74	76	74	74	75	74	74	74	76	74	74	75	75	74	74	75	74	74	18385·27

FORMS FOR SHORT-PERIOD TIDES.

SERIES $2M_2K_1$.—(*Continued*).

Day	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	Solar Hour	
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*d*	*h*
284	7·71	6·07	5·84	6·88	8·87	11·47	14·12	15·94	16·22	14·81	11·87	8·55 5·46	3·46	2·87	4·17	6·35	9·32	13·00	15·95	17·47	17·44	15·72	12·68	9·66	298	16
285	7·28	5·94	6·04	7·36	9·64	12·45	14·84	16·04	15·60 13·70	10·52	7·15	4·66	2·92	3·10	4·72	7·47	10·55	13·92	16·35	17·36	16·74	14·57	11·67	8·85	299	17
286	6·76	5·94	6·28	7·70	9·92 12·68	14·78	15·58	14·78	12·36	9·26	6·36	4·20	3·07	3·72	5·55	8·04	11·05	14·10	16·17	16·96	16·12	14·06	11·35	8·82	300	18
287	7·14	6·57 7·02	8·46	10·56	13·14	14·64	15·04	13·76	11·47	8·74	6·42	4·70	4·22	5·00	6·80	9·02	11·88	14·60	16·14	16·22	15·16	13·26	10·86 8·86	7·58	301	20
288	7·14	7·44	8·84	10·92	12·84	13·84	13·86	12·57	10·68	8·54	6·84	5·56	5·27	5·98	7·33	9·36	11·72	14·00	15·22 15·38	14·58	12·88	11·01	9·42	8·12	302	21
289	7·64	7·92	8·94	10·40	11·85	12·91	13·12	12·26	10·75	9·22	7·66	6·68	6·30	6·72	7·86	9·44 11·50	13·34	14·46	14·66	13·96	12·74	11·30	9·76	8·54	303	22
290	7·93	7·84	8·40	9·60	10·88	12·06	12·64	12·40	11·47	10·10	8·76	7·68	7·01 7·06	7·90	9·22	10·97	12·56	13·72	14·38	14·04	13·04	11·45	9·76	8·15	304	23
291	7·22	7·02	7·48	8·84	10·32	11·48	12·55	12·87	12·46	11·36 9·70	8·28	7·14	6·80	7·40	8·84	10·74	12·56	13·87	14·54	14·38	13·40	11·67	9·60	7·53	306	0
292	6·30	5·88	6·50	8·20	10·07	11·93 13·36	14·04	13·66	12·30	10·26	8·61	7·37	6·86	7·24	8·35	10·36	12·50	14·13	15·08	14·96	13·80	11·64	9·03	6·96	307	1
293	5·44	5·04	5·86 7·79	10·12	12·66	14·54	15·37	14·86	13·04	10·66	8·56	7·12	6·44	6·77	8·02	10·14	12·62	14·56	15·55	15·25	13·56	10·92	8·12	5·82 4·22	308	3
294	4·10	5·32	7·70	10·85	13·60	15·51	16·05	15·06	12·86	10·40	8·16	6·53	5·96	6·51	8·24	10·85	13·27	15·16	15·84	15·03 12·98	9·78	7·04	4·71	3·46	309	4
295	3·86	5·60	8·44	11·74	14·64	16·50	16·72	15·38	12·86	9·98	7·70	6·25	5·93	6·71	8·67	11·25	13·84 15·52	15·84	14·55	11·68	8·46	5·64	3·63	3·01	310	5
296	4·08	6·50	9·62	13·08	15·81	17·12	16·72	14·87	12·03	9·20	7·26	6·32	6·37	7·46 9·60	12·20	14·35	15·67	15·28	13·15	10·15	7·00	4·47	3·03	3·22	311	6
297	5·03	7·60	10·76	14·05	16·38	17·05	16·14	13·92	11·10	8·66	6·87 6·16	6·46	8·00	10·44	13·10	14·76	15·16	13·92	11·40	8·36	5·66	3·69	2·94	3·94	312	7
298	6·18	9·01	12·24	14·92	16·53	16·56	15·16 12·66	10·06	7·96	6·74	6·60	7·35	9·00	11·24	13·43	14·50	14·36	12·66	9·94	7·20	4·97	3·56	3·77	5·34	313	8
299	7·72	10·56	13·46	15·64 16·34	15·71	13·92	11·46	9·28	7·66	6·86	6·98	7·98	9·96	12·00	13·52	14·02	13·37	11·18	8·81	6·52	4·86	4·33	5·20	6·90	314	9
300	9·14 11·80	14·20	15·72	15·81	14·66	12·72	10·71	8·96	7·82	7·56	7·92	9·16	10·68	12·24	13·26	13·26	12·06	10·17	8·00	6·25	5·31 5·50	6·66	8·34	10·52	315	11
301	12·80	14·44	15·18	14·68	13·32	11·56	10·02	8·76	8·10	8·00	8·60	9·65	10·96	12·18	12·58	12·23	11·04	9·16 7·62	6·54	6·20	6·84	7·96	9·38	11·14	316	12
302	12·91	14·18	14·40	13·64	12·37	10·90	9·58	8·78	8·46	8·68	9·30	10·00	10·94	11·57	11·80 11·36	10·28	8·94	7·84	7·18	7·20	7·86	8·80	9·98	11·46	317	13
303	12·86	13·86	13·83	12·96	11·72	10·53	9·66	9·14	8·92	8·96	9·17	9·66 10·40	11·10	11·37	11·01	10·20	9·26	8·46	8·10	8·14	8·66	9·44	10·56	11·74	318	14
304	12·76	13·34	13·26	12·61	11·72	10·86	9·76	9·04 8·80	8·85	9·16	9·64	10·14	10·74	11·18	11·32	11·06	10·38	9·58	8·94	8·71	8·90	9·50	10·42	11·46	319	15
305	12·48	13·10	13·15	12·64	11·84 10·76	9·71	8·88	8·35	8·19	8·42	9·04	9·96	10·86	11·50	11·80	11·55	10·96	9·98	9·08	8·64	8·75	9·38	10·38	11·46	320	16
306	12·41	13·07 13·16	12·84	11·84	10·56	9·24	8·13	7·50	7·43	7·86	8·83	10·03	11·16	12·23	12·80	12·64	11·66	10·25	9·04	8·36	8·34	8·96 10·02	11·20	12·46	321	18
307	13·23	13·47	13·00	11·72	10·14	8·38	7·03	6·27	6·31	7·08	8·52	10·23	11·92	13·17	13·63	13·10	11·86	10·18	8·76 7·98	7·96	8·75	10·13	11·64	13·14	322	19
308	13·94	13·94	13·04	11·34	9·30	7·45	5·86	5·13	5·46	6·76	8·80	11·15	13·20	14·66	14·98	13·87 11·76	9·58	8·10	7·27	7·36	8·22	9·82	11·76	13·33	323	20
309	14·28	14·14	12·87	10·56	7·98	5·77	4·14	3·74	4·67	6·71	9·27	12·02	14·40 15·66	15·44	13·71	11·16	8·74	7·02	6·40	6·78	8·22	10·37	12·25	13·88	324	21
310	14·74	14·20	12·26	9·36	6·51	4·12	2·75	2·94	4·56 7·03	10·05	13·27	15·65	16·62	15·90	13·76	10·86	8·17	6·45	5·84	6·36	8·12	10·44	12·84	14·46	325	22
311	15·08	13·97	11·41	8·07	4·96	2·57 1·63	2·58	4·74	7·64	11·12	14·22	16·47	17·07	15·75	12·96	9·86	7·26	5·65	5·46	6·44	8·40	11·20	13·57	15·11	326	23
312	15·17	13·27	9·96 6·40	3·62	1·76	1·54	3·26	6·02	9·25	12·97	15·66	17·40	17·25	15·37	12·23	9·00	6·75	5·63	5·63	6·88	9·32	12·22	14·44 15·50	14·80	328	1
313	12·31	8·84	5·46	3·00	1·66	2·20	4·15	6·95	10·46	13·81	16·44	17·54	16·82	14·56	11·38	8·50	6·32	5·44	5·74	7·26 10·06	12·76	14·67	15·26	14·06	329	2
314	11·32	8·05	5·16	2·94	2·16	3·11	5·16	7·96	11·23	14·30	16·57	17·22	16·23	13·81	10·68	8·07	6·16 5·50	5·88	7·64	10·25	12·77	14·29	14·72	13·33	330	3
315	10·74	7·81	5·32	3·66	3·26	4·42	6·34	8·86	11·67	14·58	16·33	16·57	15·28 12·84	9·93	7·47	6·23	5·72	6·26	7·94	10·30	12·38	13·76	13·96	12·68	331	4
316	10·56	8·18	6·28	4·97	4·83	5·73	7·34	9·38	12·05	14·37 15·76	15·80	14·56	12·28	9·94	8·13	6·64	6·14	6·54	8·04	10·04	11·78	12·86	13·16	12·24	332	5
317	10·73	8·96	7·30	6·24	5·96	6·50	7·80 9·84	12·15	13·88	14·87	14·84	13·77	11·77	10·06	8·23	6·86	6·34	6·56	7·70	9·30	10·84	12·16	12·76	12·53	333	6
318	11·48	10·14	8·60	7·52 7·06	7·44	8·47	10·17	11·91	13·34	14·21	14·40	13·72	12·30	10·42	8·41	6·88	6·14	6·37	7·32	8·81	10·45	11·84	12·86	13·08 12·42	334	8

319	11·25	9·75	8·54	7·84	7·88	8·64	10·02	11·65	13·16	14·14	14·30	13·64	12·17	10·31	8·37	6·68	5·72	5·86	6·88	8·64	10·40 12·07	13·31	13·88	13·62	335 9
320	12·36	10·67	9·06	8·12	7·90	8·54	9·72	11·26	12·78	13·82	14·20	13·74	12·14	10·05	7·76	6·00	5·04	5·23 6·52	8·50	10·56	12·60	14·12	14·40	13·86	336 10
321	12·58	10·80	8·97	7·94	7·68	8·24	9·50	11·14	12·75	13·98	14·44	13·73	11·85	9·10 6·84	5·06	4·41	5·04	6·57	8·66	11·20	13·52	15·24	15·84	15·08	337 11
322	13·13	10·86	9·00	7·82	7·54	8·05	9·36	11·14	12·94	14·20	14·46 13·36	11·28	8·58	5·98	4·22	3·96	5·07	6·97	9·54	12·26	14·54	16·11	16·34	15·17	338 12
323	12·88	10·26	8·38	7·53	7·40	8·14	9·77	11·52 13·36	14·60	14·56	12·94	10·26	7·33	5·11	3·87	4·05	5·64	7·81	10·61	13·20	15·47	16·54	16·21	14·70	339 13
324	12·20	9·81	8·08	7·33	7·37 8·31	10·05	12·02	13·86	14·76	14·17	12·16	8·93	6·32	4·31	3·72	4·64	6·56	9·06	11·87	14·55	16·23	16·72	15·97	13·94	340 14
325	11·34 8·98	7·71	7·36	7·70	9·02	10·97	12·94	14·40	14·70	13·44	10·64	7·77	5·58	4·12	4·16	5·63	7·85	10·36	13·16	15·34	16·56	16·48 15·11	12·72	10·27	341 16
326	8·26	7·37	7·26	8·12	9·82	11·91	13·58	14·48	14·07	12·12	9·32	6·72	4·74	3·96	4·91	6·70	9·02	11·70	14·07 15·87	16·56	15·80	13·96	11·44	9·32	342 17
327	7·80	7·24	7·44	8·72	10·57	12·55	14·00	14·24	13·24	10·72	8·06	5·93	4·58	4·74	6·03 8·20	10·34	12·88	15·05	16·23	16·28	14·89	12·63	10·30	8·54	343 18
328	7·57	7·44	8·17	9·64	11·50	13·03	13·80	13·45	11·78	9·47	7·26	5·64 5·07	5·86	7·43	9·20	11·48	13·56	15·17	15·82	15·18	13·58	11·42	9·46	7·98	344 19
329	7·36	7·62	8·50	10·02	11·60	12·67	13·00	12·14	10·36 8·34	6·54	5·59	5·67	6·77	8·43	10·27	12·17	13·90	14·96	14·86	13·76	12·00	10·22	8·66	7·73	345 20
330	7·38	7·80	8·82	10·22	11·48	12·26 12·24	11·15	9·47	8·01	6·87	6·45	6·75	7·83	9·14	10·75	12·56	13·86	14·46	14·06	12·87	11·31	9·72	8·40	7·76	346 21
331	7·73	8·27 9·36	10·54	11·48	12·02	11·81	10·84	9·56	8·46	7·76	7·56	8·00	8·95	10·05	11·60	13·13	14·20	14·42	13·83	12·50	10·98	9·76	8·76 8·24	8·24	347 23
332	8·80	9·62	10·53	11·27	11·70	11·62	11·14	10·38	9·49	8·78	8·48	8·71	9·47	10·70	12·04	13·16	13·78	13·79	13·14	11·94 10·54	9·17	8·30	7·83	8·04	349 0
333	8·58	9·36	10·22	11·00	11·54	11·74	11·57	10·96	10·14	9·44	9·04	9·10	9·74	10·90	12·24	13·16 13·57	13·38	12·64	11·55	10·26	8·86	7·83	7·22	7·36	350 1
334	7·86	8·85	10·11	11·13	11·95	12·42	12·30	11·78	10·77	9·72	9·06	9·01	9·55 10·76	11·97	12·94	13·38	13·14	12·44	11·22	9·78	8·36	7·04	6·26	6·15	351 2
335	6·82	8·20	9·97	11·56	12·90	13·50	13·36	12·36	10·92	9·68 8·84	8·68	9·14	10·18	11·57	12·76	13·30	13·22	12·46	11·00	9·17	7·18	5·75	4·90	4·92	352 3
336	6·07	7·94	10·07	12·03	13·66	14·48 14·16	12·76	10·77	9·04	7·98	7·73	8·23	9·70	11·40	12·74	13·42	13·45	12·54	10·80	8·50	6·30	4·47	3·64	4·12	353 4
337	5·82	8·20	10·84 13·27	14·95	15·70	14·97	13·05	10·60	8·64	7·50	7·36	8·16	9·80	11·80	13·38	14·33	14·26	13·00	10·50	7·72	5·17	3·42	2·93	4·16 6·37	354 6
338	9·00	12·12	14·97	16·74	16·96	15·68	13·11	10·34	8·06	6·98	7·04	8·06	10·00	12·15	14·04	15·14	15·03	13·10	10·20	7·00	4·27 2·40	2·20	3·93	6·57	355 7
339	9·77	13·27	16·13	17·72	17·51	15·78	12·57	9·74	7·27	6·14	6·36	7·56	9·86	12·72	14·77	15·81	15·20 12·64	9·26	5·91	3·10	1·55	1·93	4·00	7·06	356 8
340	10·68	14·30	17·04	18·34	17·72	15·47	12·00	8·88	6·58	5·67	6·00	7·50	10·14	13·10 15·24	16·17	14·94	12·16	8·55	5·06	2·64	1·50	2·57	5·14	8·44	357 9
341	11·93	15·00	17·66	18·34	17·37	14·51	10·92	7·77	5·66	5·14	5·64 7·65	10·63	13·44	15·46	15·86	14·14	10·98	7·68	4·48	2·36	1·77	3·30	5·83	8·90	358 10
342	12·30	15·56	17·50	17·88	16·62	13·58	9·97 6·94	5·14	4·70	5·52	7·63	10·73	13·70	15·36	15·32	13·24	9·92	6·64	4·73	3·07	3·08	4·74	6·97	9·86	359 11
343	13·01	15·80	17·38	17·48 15·95	12·86	9·53	6·72	5·22	4·90	5·87	8·03	10·96	13·30	14·68	14·83	13·24	10·55	7·68	5·43	4·33	4·63	5·97	8·02	10·57	360 12
344	13·25 15·58	16·60	16·14	14·11	11·13	8·76	6·38	5·17	5·13	6·30	8·60	10·76	12·74	13·74	13·62	12·37	10·30	8·14	6·53	5·84	6·14	7·14 8·74	10·77	13·13	361 14
345	14·96	15·71	15·12	13·32	10·86	8·44	6·53	5·48	5·27	6·00	7·78	9·85	11·62	12·84	13·10	12·28	10·74	9·22 7·96	7·33	7·28	7·93	9·16	10·97	13·12	362 15
346	14·54	14·68	13·66	12·28	10·12	8·24	6·78	5·82	5·70	6·37	7·72	9·40	11·06	12·32	12·86 12·50	11·47	10·24	9·12	8·42	8·24	8·54	9·54	11·12	12·64	363 16
347	13·57	13·57	12·88	11·44	9·87	8·24	6·74	5·77	5·52	6·12	7·27	8·94 10·64	12·10	13·01	13·12	12·46	11·26	10·02	9·06	8·58	8·66	9·44	10·68	11·96	364 17
348	12·92	13·14	12·66	11·54	10·06	8·36	6·86	5·72 5·37	5·87	7·17	9·14	11·00	12·70	13·68	13·81	12·94	11·57	10·28	9·14	8·62	8·63	9·20	10·44	11·66	365 18
349	12·53	12·92	12·58	11·64	9·77 7·86	6·12	5·05	4·78	5·62	7·06	9·15	11·26	13·23	14·30	14·32	13·36	11·78	10·34	9·17	8·44	8·24	8·62	9·76	11·04	366 19
350	12·36	13·08 12·90	11·65	9·64	7·34	5·52	4·45	4·52	5·76	7·66	9·97	12·43	14·27	15·18	14·97	13·73	11·82	10·16	8·86	8·24	8·26	8·96	10·32 11·70	12·96	367 21
351	13·58	13·16	11·26	8·91	6·66	4·96	4·33	4·86	6·36	8·55	11·00	13·44	15·21	15·84	15·17	13·56	11·44	9·66	8·38 7·80	7·97	9·00	10·56	12·24	13·46	368 22
352	13·82	12·72	10·52	7·90	5·74	4·34	4·11	5·34	7·23	9·78	12·44	14·65	15·93	15·94	14·74	12·37 10·23	8·53	7·47	7·31	7·97	9·38	11·36	13·14	14·17	369 23
353	14·00	12·18	9·43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	370 2
Sum	754·84	775·43	769·80	779·09	774·44	767·05	736·57	711·53	698·42	694·30	689·37	708·60	745·91	755·41	774·94	794·48	772·00	743·83	751·69	722·89	696·75	710·39	727·80	718·29	No. of Days. 72d 11h.
No.	73	74	73	73	73	73	72	72	72	72	72	73	73	72	72	73	72	72	73	72	72	72	73	72	17773·82

FORMS FOR SHORT-

BOMBAY—Summations and Means of

Series S.		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 80–81)	814·09	807·47	768·68	713·90	656·10	612·63	601·16	628·55	691·30	776·04	866·90	936·49
	„ (pp. 82–83)	885·27	889·48	864·56	818·97	767·77	731·08	714·25	726·49	762·13	811·55	860·03	891·16
	„ (pp. 84–85)	943·28	948·07	928·91	889·06	838·11	788·76	748·57	726·62	726·18	746·27	773·80	793·58
	„ (pp. 86–87)	937·59	911·22	852·77	773·80	692·27	628·64	595·34	600·56	643·42	708·54	779·87	831·26
	„ (pp. 88–89)	814·95	774·00	708·99	629·27	572·10	540·36	545·06	587·93	658·53	742·96	822·19	880·63
	Sum (pp. 80–89)	4395·18	4330·24	4123·91	3825·00	3526·35	3301·47	3204·38	3270·15	3481·56	3785·36	4102·79	4333·12
	No. of Obs. ...	370	370	370	369	369	369	369	369	369	369	369	369
	Means ...	11·879	11·703	11·146	10·366	9·557	8·947	8·684	8·862	9·435	10·258	11·119	11·743

Series K.		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 110–111)	723·67	769·74	798·21	798·65	762·13	720·27	665·02	622·68	607·77	627·02	667·96	758·10
	„ (pp. 112–113)	570·44	551·64	568·43	618·93	689·36	756·30	830·55	870·19	879·69	860·79	823·73	771·49
	„ (pp. 114–115)	769·73	738·35	721·10	680·42	642·70	620·46	605·70	645·71	699·54	763·58	829·96	887·21
	„ (pp. 116–117)	617·23	654·72	698·28	764·60	807·84	825·07	812·56	780·34	723·32	704·58	688·28	691·72
	„ (pp. 118–119)	670·87	618·09	583·62	568·88	596·11	647·59	715·26	782·36	840·22	865·32	889·31	881·87
	Sum (pp. 110–119)	3351·94	3332·54	3369·64	3431·48	3498·14	3569·69	3629·09	3701·28	3750·54	3821·29	3899·24	3990·39
	No. of Obs. ...	370	370	370	369	369	369	369	369	369	369	369	369
	Means ...	9·059	9·007	9·107	9·299	9·480	9·674	9·835	10·031	10·164	10·356	10·567	10·814

Series P.		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 120–121)	743·72	718·78	706·28	675·00	674·86	696·17	737·20	796·85	836·16	874·43	894·54	893·37
	„ (pp. 122–123)	765·35	780·58	802·43	818·37	826·64	805·16	775·77	738·35	698·73	664·17	643·97	655·10
	„ (pp. 124–125)	758·50	725·12	691·31	657·84	633·01	627·22	644·31	681·17	745·69	791·37	841·75	875·48
	„ (pp. 126–127)	683·96	676·63	701·39	742·61	805·54	846·95	879·65	888·81	886·43	825·84	769·07	711·23
	„ (pp. 128–129)	770·71	802·26	798·49	773·28	734·99	690·39	625·86	587·29	575·29	601·92	644·62	709·32
	Sum (pp. 120–129)	3722·24	3703·37	3700·40	3667·10	3675·04	3665·89	3662·79	3692·47	3742·30	3757·73	3793·95	3844·50
	No. of Obs. ...	370	370	370	368	370	369	368	369	370	369	368	369
	Means ...	10·060	10·009	10·001	9·965	9·933	9·935	9·953	10·007	10·114	10·184	10·310	10·419

Series μ or 2 MS.		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 190–191)	789·10	761·54	724·19	701·96	720·79	713·01	694·59	734·49	733·71	750·75	771·98	782·62
	„ (pp. 192–193)	800·65	786·16	769·81	790·17	781·19	761·18	763·01	755·73	755·50	728·19	738·55	730·58
	„ (pp. 194–195)	806·79	806·60	812·33	806·72	792·57	775·12	796·98	810·84	774·19	807·97	796·20	756·78
	„ (pp. 196–197)	772·62	751·66	767·12	757·22	732·52	765·92	777·83	762·45	808·90	813·02	803·52	799·98
	„ (pp. 198–199)	700·30	724·13	717·75	679·85	724·83	733·43	735·74	760·51	768·13	744·32	744·70	774·97
	Sum (pp. 190–199)	3869·46	3830·09	3791·20	3735·92	3751·90	3748·66	3768·15	3824·02	3840·43	3844·25	3854·95	3844·93
	No. of Obs. ...	370	370	371	368	369	369	369	370	369	369	368	369
	Means ...	10·458	10·352	10·219	10·152	10·168	10·159	10·212	10·335	10·408	10·418	10·475	10·420

PERIOD TIDES.

Series S, K, P, and μ or 2 MS.

12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		SERIES S.
975·00	976·40	939·65	873·58	794·64	719·55	662·98	634·76	641·91	681·53	734·50	786·21	18294·02	
889·23	848·64	777·93	694·49	619·85	569·27	555·03	578·32	633·64	709·45	788·20	850·54	18237·33	
793·05	769·34	722·70	666·49	620·53	596·14	604·10	640·99	705·26	783·60	857·11	913·59	18524·11	
854·14	845·43	805·24	749·88	695·89	659·99	659·79	691·62	747·19	815·87	881·94	926·37	18288·63	
912·48	915·78	892·52	849·63	799·14	754·68	726·45	720·34	734·38	761·88	791·71	808·45	17944·41	
4423·90	4355·59	4138·04	3834·07	3530·05	3299·63	3208·35	3266·03	3462·38	3752·33	4053·46	4285·16	91288·50	
369	369	369	369	369	369	369	369	369	369	369	369		
11·989	11·804	11·214	10·390	9·567	8·942	8·695	8·851	9·383	10·169	10·985	11·613		

12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		SERIES K.
843·55	919·92	973·32	986·21	945·71	887·75	817·96	736·38	671·32	637·88	629·45	666·34	18237·01	
742·30	726·11	737·99	770·45	815·94	858·86	874·14	890·72	859·37	798·26	718·33	626·24	18210·25	
914·17	945·43	935·76	904·46	859·81	810·17	766·70	727·42	726·27	733·12	751·09	768·07	18446·93	
722·35	755·99	828·47	884·66	921·14	927·27	897·33	832·70	770·54	696·55	637·83	603·82	18247·19	
858·64	828·38	792·71	765·16	776·25	780·49	792·29	804·99	795·42	798·40	770·62	724·27	18147·12	
4081·01	4175·83	4268·25	4310·94	4318·85	4264·54	4148·42	3992·21	3822·92	3664·21	3507·32	3388·74	91288·50	
369	369	369	369	369	369	369	368	369	370	369	369		
11·060	11·317	11·567	11·683	11·704	11·557	11·242	10·848	10·360	9·903	9·505	9·184		

12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		SERIES P.
872·66	838·37	811·25	758·37	723·67	703·57	708·17	707·86	726·33	742·58	757·68	748·31	18346·18	
665·06	697·24	738·53	788·71	809·26	827·16	829·40	825·28	802·42	785·13	771·52	779·76	18294·09	
902·52	882·87	863·18	836·11	813·57	781·59	762·62	753·46	770·31	765·53	770·30	765·89	18341·22	
670·97	649·89	657·70	686·26	729·49	790·89	809·39	827·21	817·18	787·58	747·06	708·59	18300·32	
779·56	859·60	887·44	907·40	898·25	864·39	817·12	769·86	732·94	720·86	717·84	737·01	18006·69	
3890·77	3927·97	3958·10	3976·85	3974·24	3967·60	3926·70	3883·67	3849·18	3801·68	3764·40	3739·56	91288·50	
370	369	369	369	369	369	369	369	369	369	369	369		
10·516	10·645	10·727	10·777	10·770	10·752	10·641	10·525	10·431	10·303	10·202	10·134		

12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		SERIES μ OR 2 MS.
788·62	754·95	752·98	774·99	755·78	779·99	795·27	793·64	785·61	820·56	819·36	793·54	18294·02	
696·54	703·17	732·62	734·36	737·45	760·70	772·33	754·56	798·87	810·38	798·35	793·41	18253·46	
762·42	753·69	737·14	694·92	718·68	717·71	707·38	744·73	779·56	769·99	790·25	806·92	18526·48	
806·10	791·47	744·97	751·18	718·14	720·00	728·12	723·82	739·64	741·67	751·35	756·37	18285·59	
777·25	756·28	772·11	764·56	786·66	770·57	787·08	782·80	747·09	739·75	729·35	706·79	17928·95	
3830·93	3759·56	3739·82	3720·01	3716·71	3748·97	3790·18	3799·55	3850·77	3882·35	3888·66	3857·03	91288·50	
370	368	369	369	369	369	370	368	369	370	369	368		
10·354	10·216	10·135	10·081	10·072	10·160	10·244	10·325	10·436	10·493	10·538	10·481		

FORMS FOR SHORT-

Bombay—Summations and Means of

Series		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Series M.		feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
	Sum (pp. 90–91)	1020·87	900·44	752·96	600·02	497·60	465·12	502·71	600·78	765·87	901·35	1016·37	1068·59
	„ (pp. 92–93)	1024·63	914·06	744·98	586·08	476·79	447·90	489·12	604·61	755·24	907·73	1036·36	1107·56
	„ (pp. 94–95)	1027·69	892·75	725·74	583·23	502·54	476·45	523·48	615·47	754·55	913·26	1051·87	1066·39
	„ (pp. 96–97)	1032·54	910·43	760·26	608·18	501·65	473·80	511·80	621·28	762·12	907·49	1021·76	1072·60
	„ (pp. 98–99)	1014·95	885·30	738·49	593·11	478·97	448·53	503·53	595·16	750·39	893·87	1015·57	1078·27
	Sum (pp. 90–99)	5120·68	4502·98	3722·43	2970·62	2457·55	2311·80	2530·64	3037·30	3788·17	4523·70	5141·93	5393·41
	No. of Obs. ...	369	369	371	370	369	368	369	369	372	368	369	369
	Means ...	13·877	12·203	10·034	8·029	6·660	6·282	6·858	8·231	10·183	12·293	13·935	14·616

Series		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Series O.		feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
	Sum (pp. 100–101)	745·01	691·67	695·23	687·13	680·95	730·71	722·78	789·33	788·74	803·03	774·59	813·78
	„ (pp. 102–103)	744·58	744·14	745·38	733·90	753·80	700·15	747·98	708·24	728·23	716·84	751·36	754·60
	„ (pp. 104–105)	750·62	738·47	702·83	693·10	664·46	703·65	700·15	741·62	756·99	779·83	810·97	810·04
	„ (pp. 106–107)	716·99	703·85	701·16	715·55	748·94	769·12	784·15	788·73	757·19	780·21	739·58	752·49
	„ (pp. 108–109)	755·04	734·74	751·60	689·56	708·52	694·75	703·48	684·89	727·13	728·87	756·86	776·57
	Sum (pp. 100–109)	3712·24	3612·87	3596·20	3519·24	3556·67	3598·38	3658·54	3712·81	3758·28	3808·78	3833·36	3907·48
	No. of Obs. ...	371	370	371	368	368	369	370	370	368	369	368	370
	Means ...	10·006	9·765	9·693	9·563	9·665	9·752	9·888	10·035	10·213	10·322	10·417	10·561

Series		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Series J.		feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
	Sum (pp. 130–131)	762·81	771·19	763·32	757·94	768·36	742·42	745·02	746·89	740·06	729·58	732·71	749·20
	„ (pp. 132–133)	755·67	750·24	740·17	758·79	737·14	736·63	754·33	742·58	748·16	775·97	758·28	779·80
	„ (pp. 134–135)	769·97	761·46	759·40	765·29	765·97	782·88	770·07	774·24	798·18	787·97	788·89	797·91
	„ (pp. 136–137)	770·20	754·83	755·15	768·99	750·37	757·72	766·45	767·85	763·27	751·63	766·70	740·98
	„ (pp. 138–139)	751·35	757·98	769·15	743·83	753·45	772·13	754·10	763·62	765·09	760·54	763·39	773·08
	Sum (pp. 130–139)	3810·00	3795·70	3787·19	3794·84	3775·29	3791·78	3789·97	3795·18	3814·76	3805·69	3809·97	3840·97
	No. of Obs. ...	370	371	370	371	370	371	370	370	371	370	370	372
	Means ...	10·297	10·231	10·236	10·229	10·203	10·220	10·243	10·257	10·282	10·286	10·297	10·325

Series		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Series Q.		feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
	Sum (pp. 140–141)	747·98	740·35	747·10	742·53	763·46	739·17	764·06	778·00	780·85	765·81	754·39	746·88
	„ (pp. 142–143)	769·09	740·33	773·60	721·18	740·99	745·29	768·76	735·74	742·12	749·25	764·15	771·41
	„ (pp. 144–145)	764·31	787·43	750·82	777·22	768·42	755·54	742·48	728·93	770·21	759·73	787·09	779·64
	„ (pp. 146–147)	750·39	773·17	758·51	768·46	732·67	767·55	771·09	785·69	755·65	758·63	752·33	740·08
	„ (pp. 148–149)	750·90	757·95	743·99	755·91	761·36	782·39	766·39	756·46	743·89	757·48	757·41	797·17
	Sum (pp. 140–149)	3782·67	3799·23	3774·02	3765·30	3766·90	3789·94	3812·78	3784·82	3792·72	3790·90	3815·37	3835·18
	No. of Obs. ...	369	371	369	370	370	371	372	370	371	·369	370	370
	Means ...	10·251	10·241	10·228	10·176	10·181	10·215	10·249	10·229	10·223	10·273	10·312	10·365

PERIOD TIDES.

Series M, O, J, and Q.

12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		
1045·66	921·58	748·92	586·33	476·86	459·09	492·81	595·88	744·51	912·16	1021·90	1075·13	18173·51	Series M.
1058·74	937·98	779·46	599·48	499·89	451·76	494·27	610·92	770·90	916·80	1048·80	1093·78	18357·84	
1021·39	899·21	742·68	599·35	494·34	482·75	533·46	650·77	799·94	940·31	1041·05	1070·88	18409·55	
1060·31	924·04	744·15	591·06	495·43	460·89	511·58	610·72	763·36	946·14	1054·15	1072·91	18418·65	
1033·88	910·94	761·64	592·07	476·85	437·85	478·26	584·39	738·21	878·16	989·11	1051·45	17928·95	
5219·98	4593·75	3776·85	2968·29	2443·37	2292·34	2510·38	3052·68	3816·92	4593·57	5155·01	5364·15	91288·50	
370	369	371	368	368	369	369	368	369	369	368	369		
14·108	12·449	10·180	8·066	6·640	6·212	6·803	8·295	10·344	12·449	14·008	14·537		

12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		
745·79	764·28	763·48	760·84	779·48	782·19	832·47	816·07	838·97	801·49	803·77	738·84	18350·62	Series O.
777·61	804·95	814·93	824·98	812·14	820·54	774·60	795·55	779·96	755·00	757·02	755·77	18302·25	
821·23	808·73	788·43	770·37	769·74	758·91	793·22	799·07	798·23	803·96	779·79	784·21	18328·62	
745·90	763·61	772·47	786·92	811·51	832·13	840·80	821·35	770·38	754·72	741·66	709·07	18308·48	
787·04	780·12	786·89	786·56	785·66	782·46	760·00	765·24	764·66	764·68	766·75	756·46	17998·53	
3877·57	3921·69	3926·20	3929·67	3958·53	3976·23	4001·09	3997·28	3952·20	3879·85	3848·99	3744·35	91288·50	
368	370	370	368	369	368	370	370	369	367	370	368		
10·537	10·599	10·611	10·678	10·728	10·805	10·814	10·803	10·711	10·572	10·403	10·175		

12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		
745·64	742·01	768·91	774·83	746·57	777·49	768·34	760·60	755·80	738·47	764·47	741·40	18094·03	Series J.
783·39	780·79	779·34	787·09	769·15	771·73	768·24	757·15	752·14	766·26	750·58	757·83	18261·45	
776·78	778·93	784·36	757·58	770·02	765·98	745·04	775·30	744·58	773·91	780·60	763·40	18538·71	
738·34	753·48	742·69	751·19	770·36	759·39	773·99	786·32	780·88	788·02	776·86	766·77	18302·43	
780·94	777·30	769·74	790·39	768·99	774·15	782·99	766·54	767·24	758·51	735·08	753·06	18352·64	
3825·09	3832·51	3845·04	3861·08	3825·09	3848·74	3838·60	3845·91	3800·64	3825·17	3807·59	3782·46	91549·26	
370	370	371	372	368	370	370	371	368	370	370	369		
10·338	10·358	10·364	10·379	10·394	10·402	10·375	10·366	10·328	10·338	10·291	10·251		

12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		
750·22	787·54	746·59	773·31	769·37	783·82	751·20	779·06	757·21	777·05	774·22	732·98	18253·15	Series Q.
788·42	756·35	763·27	769·01	749·10	775·62	761·21	780·98	756·62	792·66	743·04	765·72	18223·91	
772·88	772·18	780·18	771·08	776·86	776·52	774·13	790·96	779·33	775·94	776·29	792·73	18510·90	
780·04	756·52	779·19	758·40	775·27	752·88	772·08	740·38	751·69	766·59	746·32	748·12	18241·70	
756·01	759·53	781·47	777·74	790·50	749·28	770·69	763·27	776·05	744·37	749·23	770·16	18319·60	
3847·57	3832·12	3850·70	3849·54	3861·10	3838·12	3829·31	3854·65	3820·90	3856·61	3789·10	3809·71	91549·26	
372	370	372	371	370	369	368	370	368	372	369	372		
10·343	10·357	10·351	10·376	10·435	10·401	10·406	10·418	10·383	10·367	10·269	10·241		

FORMS FOR SHORT.

Bombay—Summations and Means of

Series L.		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 150–151)	767·45	775·49	790·38	795·81	775·44	765·23	765·55	762·71	764·99	758·26	754·06	771·84
	„ (pp. 152–153)	781·94	769·25	781·62	775·65	772·92	774·30	748·58	741·30	772·33	772·27	753·41	752·06
	„ (pp. 154–155)	744·20	733·19	711·16	731·34	740·36	768·40	785·65	776·33	768·16	753·67	754·56	763·77
	„ (pp. 156–157)	757·40	783·38	817·68	801·03	787·31	777·56	766·91	785·93	767·18	752·00	747·92	752·45
	„ (pp. 158–159)	645·19	639·71	621·95	643·14	641·99	632·37	648·86	660·85	672·34	672·17	669·20	657·44
	Sum (pp. 150–159)	3696·18	3701·02	3722·79	3746·97	3718·02	3717·86	3715·55	3727·12	3745·00	3708·37	3679·15	3697·56
	No. of Obs. ...	359	359	357	360	358	358	359	359	359	359	358	358
	Means ...	10·296	10·309	10·428	10·408	10·386	10·385	10·350	10·382	10·432	10·330	10·277	10·328

Series N.		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 160–161)	783·91	741·93	710·19	709·60	684·10	693·37	732·72	748·53	791·19	830·15	840·57	818·68
	„ (pp. 162–163)	853·32	826·32	788·18	704·52	672·72	654·78	687·53	715·07	755·90	811·69	848·81	860·01
	„ (pp. 164–165)	824·98	806·89	800·14	756·21	712·03	703·03	690·51	703·39	737·45	805·95	824·51	839·99
	„ (pp. 166–167)	786·84	778·90	729·00	690·22	695·83	719·77	727·18	755·69	801·68	796·19	800·35	786·08
	„ (pp. 168–169)	744·70	732·90	684·61	651·26	620·19	564·80	561·73	592·35	640·28	659·68	694·11	747·68
	Sum (pp. 160–169)	3993·75	3886·94	3712·12	3511·81	3384·87	3335·75	3399·67	3515·03	3726·50	3903·66	4008·35	4052·44
	No. of Obs. ...	357	359	360	358	358	359	360	357	359	360	358	358
	Means ...	11·187	10·827	10·311	9·810	9·455	9·292	9·444	9·846	10·380	10·844	11·197	11·320

Series λ.		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 170–171)	805·33	779·93	769·55	794·05	770·85	773·79	754·69	739·87	740·77	772·47	804·96	812·35
	„ (pp. 172–173)	729·58	750·10	763·88	784·78	751·80	743·68	751·85	738·00	744·66	730·62	713·40	709·54
	„ (pp. 174–175)	777·01	757·60	745·75	747·40	779·76	804·32	832·18	826·31	812·11	795·82	812·94	774·66
	„ (pp. 176–177)	767·08	766·50	757·45	761·02	729·94	707·88	695·14	698·96	725·36	744·78	791·32	778·57
	„ (pp. 178–179)	543·81	523·35	533·19	549·04	559·76	593·98	604·87	598·03	586·54	579·28	561·87	556·56
	Sum (pp. 170–179)	3622·81	3577·48	3569·82	3636·29	3592·11	3623·65	3638·73	3601·17	3609·44	3622·97	3684·49	3631·68
	No. of Obs. ...	353	349	348	353	350	350	353	349	348	350	353	350
	Means ...	10·263	10·251	10·258	10·301	10·263	10·353	10·308	10·319	10·372	10·351	10·438	10·376

Series ν.		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 180–181)	791·28	776·61	818·85	785·56	727·80	661·77	670·27	719·60	768·73	790·99	763·82	794·45
	„ (pp. 182–183)	682·71	719·43	684·25	727·93	818·70	880·24	875·62	789·39	754·54	789·51	723·54	689·66
	„ (pp. 184–185)	789·41	809·09	802·44	758·56	708·49	678·49	729·56	784·69	822·44	777·45	795·34	865·76
	„ (pp. 186–187)	840·73	786·15	738·93	740·84	775·03	753·94	688·49	681·39	736·85	783·00	812·76	757·39
	„ (pp. 188–189)	479·15	535·61	575·11	611·05	577·88	584·12	613·64	623·08	557·65	499·96	483·21	522·49
	Sum (pp. 180–189)	3583·28	3626·89	3619·58	3623·94	3607·90	3558·56	3577·58	3598·15	3640·21	3640·91	3578·67	3629·75
	No. of Obs ...	346	349	352	353	351	346	350	352	353	350	346	351
	Means ...	10·356	10·392	10·283	10·266	10·279	10·285	10·222	10·222	10·312	10·403	10·343	10·341

PERIOD TIDES.

Series L, N, λ, and ν.

12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h		
feet 800·60	*feet* 796·45	*feet* 810·02	*feet* 790·80	*feet* 763·78	*feet* 766·14	*feet* 754·45	*feet* 725·41	*feet* 726·65	*feet* 726·90	*feet* 711·50	*feet* 720·83	18340·74	SERIES L.
743·78	734·36	748·64	748·56	742·33	743·79	738·09	753·74	764·34	776·73	786·00	804·00	18279·99	
754·36	749·89	752·91	773·56	778·27	798·17	796·67	805·67	792·94	781·54	764·43	740·97	18320·17	
770·82	788·49	779·87	783·29	777·60	751·13	745·10	732·96	732·43	713·15	722·45	728·20	18322·24	
632·31	613·85	619·54	606·11	617·49	615·29	619·11	634·50	650·24	654·79	670·21	654·81	15393·46	
3701·87	3683·04	3710·98	3702·32	3679·47	3674·52	3653·42	3652·28	3666·60	3653·11	3654·59	3648·81	88656·60	
360	358	358	358	357	358	358	357	357	359	358	357		
10·283	10·288	10·366	10·342	10·307	10·264	10·205	10·230	10·271	10·176	10·208	10·221		

12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h		
feet 775·35	*feet* 756·44	*feet* 712·26	*feet* 701·39	*feet* 704·93	*feet* 703·75	*feet* 731·39	*feet* 771·67	*feet* 803·35	*feet* 819·91	*feet* 834·91	*feet* 843·62	18243·91	SERIES N.
850·38	810·82	764·66	701·03	659·25	636·86	667·19	709·45	750·90	796·40	836·62	857·46	18219·87	
848·43	833·50	795·99	753·48	729·70	709·59	693·46	709·14	727·67	786·15	841·37	859·94	18493·50	
802·02	759·83	726·80	716·36	697·70	704·38	747·63	774·14	795·36	805·31	820·31	793·00	18210·57	
733·94	700·42	653·34	615·20	575·45	545·14	543·44	561·20	593·16	651·90	698·64	722·63	15488·75	
4010·12	3861·01	3653·05	3487·46	3367·03	3299·72	3383·11	3525·60	3670·44	3859·67	4031·85	4076·65	88656·60	
359	359	357	358	359	356	358	359	356	356	359	359		
11·170	10·755	10·233	9·742	9·379	9·269	9·450	9·821	10·310	10·842	11·231	11·356		

12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h		
feet 805·13	*feet* 785·61	*feet* 772·60	*feet* 783·82	*feet* 756·64	*feet* 762·68	*feet* 725·23	*feet* 700·59	*feet* 697·14	*feet* 723·64	*feet* 761·76	*feet* 768·59	18362·04	SERIES λ.
725·28	764·05	763·26	798·01	779·57	774·97	780·37	784·90	788·60	766·78	739·39	724·67	18101·74	
776·02	756·57	726·13	717·66	738·72	772·17	775·09	779·31	769·78	767·43	787·13	778·31	18610·18	
782·39	787·15	787·51	788·20	771·88	750·72	725·21	723·00	753·41	751·06	783·80	765·56	18093·89	
552·06	548·36	528·05	539·74	551·71	581·57	590·40	590·02	572·95	556·94	531·93	527·69	13461·70	
3640·88	3641·74	3577·55	3627·43	3598·52	3642·11	3596·30	3577·82	3581·88	3565·85	3604·01	3564·82	86629·55	
350	352	347	349	349	352	349	348	349	349	349	349		
10·403	10·346	10·310	10·394	10·311	10·347	10·305	10·281	10·263	10·217	10·327	10·214		

12^h	13^h	14^h	15^h	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h		
feet 836·44	*feet* 836·42	*feet* 742·44	*feet* 700·41	*feet* 697·55	*feet* 731·65	*feet* 723·79	*feet* 689·67	*feet* 709·32	*feet* 796·03	*feet* 840·00	*feet* 846·71	18220·16	SERIES ν.
645·90	671·73	761·21	796·88	832·07	799·12	842·15	836·50	809·86	697·59	653·43	660·90	18142·86	
873·47	817·80	729·26	703·49	739·23	731·48	717·37	713·51	763·46	867·42	872·08	842·15	18692·44	
765·96	826·76	826·65	784·56	712·35	707·19	739·00	748·65	744·34	712·16	751·51	793·05	18207·68	
560·63	516·09	530·96	559·39	652·61	659·66	582·64	559·17	546·27	558·67	512·06	465·31	13366·41	
3682·40	3668·80	3590·52	3544·73	3633·81	3629·10	3604·95	3547·50	3573·25	3631·87	3629·08	3608·12	86629·55	
353	352	348	344	352	351	352	346	347	351	352	351		
10·432	10·423	10·318	10·304	10·323	10·339	10·241	10·253	10·298	10·347	10·310	10·280		

FORMS FOR SHORT-

BOMBAY—Summations and Means of

Series R.

	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
Sum (pp. 200–201)	767·64	795·61	794·06	763·88	717·33	666·62	622·12	613·15	634·65	688·92	766·40	851·29
„ (pp. 202–203)	677·15	754·91	822·66	856·51	861·67	863·83	828·80	782·65	743·51	724·16	729·96	758·66
„ (pp. 204–205)	601·59	636·73	714·01	790·22	862·58	919·06	948·75	951·26	927·15	882·49	830·24	782·67
„ (pp. 206–207)	688·15	651·82	640·93	664·78	718·87	791·73	869·71	931·75	962·30	949·12	893·06	800·04
„ (pp. 208–209)	927·90	896·08	848·59	799·21	758·63	736·69	735·56	754·53	783·47	812·73	818·07	814·05
Sum (pp. 200–209)	3662·43	3735·15	3820·25	3874·60	3919·08	3977·93	4004·94	4033·34	4051·08	4057·42	4037·73	4006·71
No. of Obs. ...	369	369	370	369	369	370	369	370	370	370	369	369
Means ...	9·925	10·122	10·325	10·500	10·621	10·751	10·853	10·901	10·949	10·966	10·942	10·858
Do. of 1884 ...	9·950	10·143	10·358	10·528	10·633	10·727	10·800	10·836	10·872	10·897	10·874	10·811
Do. for 1884-85	9·938	10·133	10·342	10·514	10·627	10·739	10·827	10·869	10·911	10·932	10·908	10·835

Series T.

	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
Sum (pp. 210–211)	802·24	763·25	708·83	654·09	616·55	615·05	642·43	706·60	789·02	870·63	931·53	961·39
„ (pp. 212–213)	807·59	758·35	724·77	714·54	731·84	769·22	815·55	855·21	872·02	873·99	809·99	742·41
„ (pp. 214–215)	761·15	735·39	730·29	748·21	761·45	777·21	778·66	762·11	727·00	681·79	643·16	622·47
„ (pp. 216–217)	684·65	730·53	775·97	806·80	819·31	808·65	778·61	753·03	708·68	690·76	701·45	733·96
„ (pp. 218–219)	858·63	897·93	898·18	885·36	852·88	808·82	767·26	739·54	727·51	736·31	757·27	786·73
Sum (pp. 210–219)	3914·26	3885·45	3838·04	3809·00	3782·03	3778·95	3782·51	3816·49	3824·23	3853·48	3843·40	3846·96
No. of Obs. ...	369	370	369	370	369	370	369	370	369	370	369	370
Means ...	10·608	10·501	10·401	10·295	10·249	10·213	10·251	10·315	10·364	10·415	10·416	10·397
Do. of 1884 ...	10·671	10·656	10·536	10·386	10·252	10·152	10·120	10·121	10·168	10·233	10·307	10·381
Do. for 1884-85	10·640	10·579	10·469	10·341	10·251	10·183	10·186	10·218	10·266	10·324	10·362	10·389

Series M_2.

	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
Sum (pp. 220–221)	780·48	791·55	784·03	776·19	756·55	739·51	739·98	754·28	739·34	740·07	775·30	781·18
„ (pp. 222–223)	764·71	758·18	744·83	750·08	753·14	774·85	803·07	771·79	759·95	735·54	733·69	736·75
„ (pp. 224–225)	789·28	790·73	799·61	767·73	755·98	752·44	760·73	767·67	757·55	770·07	783·94	803·37
„ (pp. 226–227)	759·72	757·68	747·32	738·03	754·25	781·97	793·89	796·22	787·52	782·28	749·69	748·59
„ (pp. 228–229)	756·35	744·88	742·16	734·32	727·44	754·02	737·26	730·49	722·51	731·22	745·07	766·70
Sum (pp. 220–229)	3850·54	3843·02	3817·95	3766·35	3747·36	3802·79	3834·93	3820·45	3766·87	3759·18	3787·69	3836·59
No. of Obs. ...	369	368	370	370	368	370	370	369	368	370	370	368
Means ...	10·435	10·443	10·319	10·179	10·183	10·278	10·365	10·354	10·236	10·160	10·237	10·426

Series 2SM.

	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	8^h	9^h	10^h	11^h
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
Sum (pp. 230–231)	755·17	770·71	736·02	778·71	720·68	780·55	717·69	776·94	735·19	762·29	734·14	754·02
„ (pp. 232–233)	794·81	752·76	805·37	752·80	797·38	743·69	776·69	756·27	749·30	750·90	750·64	762·48
„ (pp. 234–235)	728·84	779·36	729·60	779·67	753·65	788·98	767·05	776·39	782·09	771·24	802·76	750·64
„ (pp. 236–237)	788·17	747·44	781·64	762·08	763·36	764·37	762·95	782·60	746·24	794·36	732·62	794·81
„ (pp. 238–239)	738·82	775·73	774·76	744·42	750·88	742·91	762·09	706·44	754·79	703·22	756·55	713·75
Sum (pp. 230–239)	3805·81	3826·00	3827·39	3817·68	3785·95	3820·50	3786·47	3798·64	3767·61	3782·01	3776·71	3775·71
No. of Obs. ...	369	370	370	369	368	370	370	370	370	370	370	368
Means ...	10·314	10·341	10·344	10·346	10·288	10·326	10·234	10·267	10·183	10·222	10·207	10·260

PERIOD TIDES.

Series R, T, MS, and 2 SM.

12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		Series R.
923·85	967·47	976·31	947·28	888·49	804·19	735·85	673·17	640·65	639·83	668·92	717·19	18264·87	
804·03	851·91	887·95	899·21	857·45	815·32	734·97	653·54	588·64	554·03	559·85	600·82	18212·19	
747·86	730·60	727·81	753·44	779·08	795·86	791·62	763·77	715·58	659·03	613·21	590·03	18514·64	
714·63	622·52	583·60	572·26	606·03	672·81	753·21	824·17	866·86	867·76	832·87	773·14	18252·12	
770·54	702·29	628·88	561·53	532·20	542·50	589·53	661·82	747·15	827·61	878·34	916·78	18044·68	
3960·91	3874·79	3804·55	3733·72	3663·25	3630·68	3605·18	3576·47	3558·88	3548·26	3553·19	3597·96	91288·50	
370	369	369	369	368	368	369	369	369	369	368	369		
10·705 10·663 10·684	10·501 10·449 10·475	10·310 10·250 10·280	10·118 10·051 10·085	9·954 9·889 9·922	9·866 9·757 9·812	9·770 9·668 9·719	9·692 9·592 9·642	9·645 9·534 9·590	9·616 9·525 9·571	9·655 9·585 9·620	9·751 9·743 9·747		

12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		Series T.
956·40	914·92	859·06	778·27	714·90	669·06	650·91	663·96	701·29	750·76	792·18	809·21	18322·53	
670·45	610·56	579·07	580·59	614·75	673·79	753·76	814·62	864·55	887·62	882·68	867·30	18275·22	
636·07	656·72	710·32	778·72	844·03	893·18	922·45	929·21	914·02	883·88	841·93	796·72	18536·14	
780·80	830·13	870·70	888·13	889·11	848·73	799·61	741·31	687·48	653·13	653·86	656·28	18291·67	
788·51	779·34	747·95	690·64	636·79	591·00	565·80	566·93	600·26	659·01	727·31	792·98	17862·94	
3832·23	3791·67	3767·10	3716·35	3699·58	3675·76	3692·53	3716·03	3767·60	3834·40	3897·96	3922·49	91288·50	
370	369	370	368	369	368	369	368	368	368	369	369		
10·357 10·427 10·392	10·276 10·397 10·337	10·181 10·320 10·251	10·099 10·152 10·126	10·026 9·989 10·008	9·988 9·886 9·937	10·007 9·834 9·921	10·098 9·887 9·993	10·238 10·023 10·131	10·420 10·218 10·319	10·564 10·433 10·499	10·630 10·594 10·612		

12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		Series MS.
798·51	806·78	798·63	775·47	745·83	740·42	725·86	696·82	707·13	696·37	715·24	738·79	18104·31	
736·99	744·06	727·51	727·84	759·37	771·30	790·55	809·98	806·69	784·09	782·49	789·12	18316·57	
818·22	838·19	819·00	799·31	788·61	763·24	756·48	739·28	735·82	722·48	732·46	761·19	18573·38	
735·87	713·44	705·92	705·90	736·03	763·99	790·44	825·82	806·03	794·53	793·70	781·00	18349·83	
798·98	792·90	786·05	787·74	770·67	757·51	753·07	743·23	711·19	699·69	721·89	729·07	17944·41	
3888·57	3895·37	3837·11	3796·26	3800·51	3796·46	3816·40	3815·13	3766·86	3697·16	3745·78	3799·17	91288·50	
369	370	369	369	371	369	368	369	371	367	368	369		
10·538	10·528	10·399	10·288	10·244	10·289	10·371	10·339	10·153	10·074	10·179	10·296		

12ʰ	13ʰ	14ʰ	15ʰ	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		Series 2 SM.
764·70	748·80	774·19	745·98	794·17	734·89	797·60	751·32	775·74	736·02	763·71	764·28	18173·51	
728·26	781·55	735·82	783·90	734·45	788·40	759·96	766·66	757·82	784·66	788·57	754·70	18357·84	
803·99	738·72	804·83	752·32	787·00	765·76	757·79	759·06	750·82	772·23	730·95	775·81	18409·55	
750·16	797·48	759·05	777·70	772·73	754·30	782·03	750·70	778·21	729·88	785·84	728·36	18387·09	
745·27	744·18	750·76	748·91	747·20	771·79	735·30	783·92	726·70	780·74	722·69	778·69	17960·51	
3792·38	3810·73	3824·65	3808·81	3835·55	3815·14	3832·68	3811·66	3789·29	3803·53	3791·76	3801·84	91288·50	
369	370	370	368	369	368	369	369	367	369	368	369		
10·277	10·299	10·337	10·350	10·394	10·367	10·387	10·330	10·325	10·308	10·304	10·303		

FORMS FOR SHORT.

BOMBAY—Summations and Means of

Series $2N$		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 240–241)	747·71	694·17	689·93	694·26	690·35	720·01	732·20	740·10	786·83	800·63	807·04	784·97
	„ (pp. 242–243)	753·59	728·67	742·32	746·48	732·84	732·41	725·03	731·56	728·62	734·37	716·89	741·07
	„ (pp. 244–245)	771·66	787·20	751·76	713·79	707·19	675·03	701·71	723·74	725·52	770·91	772·60	818·81
	„ (pp. 246–247)	725·25	709·21	714·11	715·11	718·09	748·25	757·39	774·00	777·74	745·74	771·49	753·66
	„ (pp. 248–249)	772·43	769·90	752·24	727·62	704·70	702·99	694·10	670·79	681·10	706·39	705·04	734·50
	Sum (pp. 240–249)	3770·64	3689·15	3650·36	3597·26	3553·17	3578·69	3610·43	3640·19	3699·81	3758·04	3773·06	3833·01
	No. of Obs. ...	370	369	371	371	368	369	370	369	369	369	368	369
	Means ...	10·191	9·998	9·839	9·696	9·655	9·698	9·758	9·865	10·027	10·184	10·253	10·388

Series M_2N		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 250–251)	744·07	765·35	682·18	726·53	707·72	711·87	782·04	755·36	851·08	818·28	852·20	849·37
	„ (pp. 252–253)	723·70	742·55	743·25	828·93	802·15	869·38	821·74	798·11	771·06	676·94	696·88	642·33
	„ (pp. 254–255)	850·16	794·49	834·07	773·34	740·77	738·25	669·89	729·18	702·16	784·95	833·44	798·44
	„ (pp. 256–257)	763·22	723·28	742·65	684·37	754·49	750·38	774·90	824·95	783·66	842·03	772·06	801·67
	„ (pp. 258–259)	668·13	745·51	761·14	785·39	841·04	787·50	825·43	734·66	729·26	698·87	625·63	678·61
	Sum (pp. 250–259)	3749·28	3771·18	3763·29	3798·56	3846·17	3857·38	3874·00	3842·26	3837·22	3821·07	3780·21	3770·42
	No. of Obs. ...	369	371	369	370	370	370	370	368	369	369	369	370
	Means ...	10·161	10·165	10·199	10·266	10·395	10·425	10·470	10·441	10·399	10·355	10·244	10·190

Series M_2K_1		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 260–261)	781·78	788·51	791·85	794·77	802·45	781·40	778·77	778·84	753·27	736·84	738·25	771·75
	„ (pp. 262–263)	764·60	765·01	775·40	762·54	773·08	759·52	753·59	741·94	752·55	752·99	751·73	749·21
	„ (pp. 264–265)	798·16	780·21	734·29	729·30	733·03	715·16	749·27	756·64	761·77	772·68	791·99	790·74
	„ (pp. 266–267)	755·82	747·60	747·56	734·08	744·58	777·64	767·21	776·91	797·38	777·38	774·20	773·75
	„ (pp. 268–269)	734·56	729·89	739·21	759·66	755·75	759·88	778·28	767·68	726·65	735·55	710·75	696·56
	Sum (pp. 260–269)	3834·92	3811·22	3788·31	3780·35	3808·89	3793·60	3827·12	3822·01	3791·62	3775·44	3766·92	3782·01
	No. of Obs. ...	369	370	370	368	370	368	369	369	369	369	369	369
	Means ...	10·393	10·301	10·239	10·273	10·294	10·309	10·372	10·358	10·275	10·232	10·208	10·249

Series $2M_2K_1$		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
	Sum (pp. 270–271)	744·23	739·16	754·05	784·12	808·42	804·42	808·31	804·33	784·12	751·65	752·78	755·05
	„ (pp. 272–273)	746·70	739·98	726·62	724·56	746·21	771·16	768·42	786·97	780·20	786·85	773·81	755·51
	„ (pp. 274–275)	808·66	798·15	780·79	781·47	737·80	732·60	734·46	726·08	747·26	764·39	768·96	797·78
	„ (pp. 276–277)	785·38	797·35	772·13	759·62	757·78	748·47	731·42	757·51	741·65	758·63	790·11	803·85
	„ (pp. 278–279)	754·84	775·43	769·80	779·09	774·44	767·05	736·57	711·53	698·42	694·30	689·37	708·60
	Sum (pp. 270–279)	3839·81	3850·07	3803·39	3828·86	3824·65	3823·70	3779·18	3786·42	3751·65	3755·82	3775·03	3820·79
	No. of Obs. ...	370	371	369	369	369	370	368	370	368	369	369	370
	Means ...	10·378	10·378	10·307	10·376	10·365	10·334	10·270	10·234	10·195	10·178	10·230	10·326

PERIOD TIDES.

Series 2N, M_2N, M_2K_1 and $2M_2K_1$.

12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		Series 2N.
769·73	769·60	745·62	768·17	759·58	795·87	821·34	832·74	823·49	803·67	804·80	763·37	18346·18	
774·16	777·63	810·66	789·71	828·49	817·00	801·22	801·81	775·74	773·18	776·86	753·78	18294·09	
836·86	831·11	822·89	796·02	778·33	787·64	778·57	777·03	812·92	819·81	812·76	818·97	18592·83	
733·03	746·95	729·65	772·71	800·69	815·81	817·37	814·37	829·91	812·02	776·11	749·42	18308·08	
745·73	745·38	775·50	772·30	776·06	759·07	739·00	773·61	760·90	761·94	764·52	751·51	17747·32	
3859·51	3870·67	3884·32	3898·91	3943·15	3975·39	3957·50	3999·56	4002·96	3970·62	3935·05	3837·05	91288·50	
370	369	368	368	370	370	367	369	369	369	370	368		
10·431	10·490	10·555	10·595	10·657	10·744	10·783	10·839	10·848	10·760	10·635	10·427		

12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		Series M_2N.
751·23	762·11	689·39	723·23	709·47	707·52	763·62	739·34	817·79	790·47	821·84	818·68	18340·74	
700·96	726·46	736·65	837·64	800·17	881·37	821·07	808·08	786·27	690·16	721·72	661·34	18288·91	
878·60	805·26	847·29	775·60	741·31	743·97	687·88	742·40	719·35	778·12	816·92	788·45	18574·29	
761·64	701·25	721·91	672·12	732·60	733·30	777·03	824·70	772·57	841·55	763·68	804·51	18324·52	
641·45	733·82	754·99	785·06	850·23	784·20	813·57	727·10	738·31	709·48	647·33	693·33	17760·04	
3733·88	3728·90	3750·23	3793·65	3833·78	3850·36	3863·17	3841·62	3834·29	3809·78	3771·49	3766·31	91288·50	
368	369	368	370	369	368	369	368	370	369	368	369		
10·146	10·105	10·191	10·253	10·390	10·463	10·469	10·439	10·363	10·325	10·249	10·207		

12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		Series M_2K_1.
755·63	771·53	804·07	797·63	779·55	779·09	762·37	752·86	724·38	729·05	751·20	749·56	18455·40	
786·09	782·56	766·05	779·76	765·55	729·05	718·63	720·51	722·85	733·23	753·80	782·11	18142·35	
791·00	812·56	809·25	774·39	754·66	762·43	732·82	731·70	764·66	784·22	782·28	786·50	18399·71	
746·31	739·01	748·30	762·19	766·54	757·39	787·53	784·99	775·45	794·98	804·28	787·02	18428·10	
707·06	706·32	729·72	734·99	759·65	762·37	758·89	780·36	782·26	753·57	746·55	746·78	17862·94	
3786·09	3811·98	3857·39	3848·96	3825·95	3790·33	3760·24	3770·42	3769·60	3795·05	3838·11	3851·97	91288·50	
369	369	370	369	369	369	368	370	369	369	369	370		
10·260	10·331	10·425	10·431	10·368	10·272	10·218	10·190	10·216	10·285	10·401	10·411		

12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h		
feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		Series $2M_2K_1$.
728·04	746·40	757·16	763·36	772·71	782·34	789·32	778·15	760·31	756·70	734·90	722·80	18382·83	
762·78	743·93	735·57	759·25	758·79	767·70	781·15	785·47	792·32	798·43	796·12	768·59	18357·09	
794·03	795·31	784·24	748·72	733·38	713·58	719·04	743·99	787·44	791·33	798·15	801·88	18389·49	
812·49	799·41	802·83	774·35	747·43	747·90	737·77	719·36	728·56	759·18	766·50	785·59	18385·27	
745·91	755·41	774·94	794·48	772·00	743·83	751·69	722·89	696·75	710·39	727·80	718·29	17773·82	
3843·25	3840·46	3854·74	3840·16	3784·31	3755·35	3778·97	3749·86	3765·38	3816·03	3823·47	3797·15	91288·50	
369	368	369	369	369	368	371	368	369	369	370	368		
10·415	10·436	10·446	10·407	10·256	10·205	10·186	10·190	10·204	10·342	10·334	10·318		

FORMS FOR SHORT-PERIOD TIDES.

Analysis of Series S.

h	I	h	II	III I+II	IV I−II	V Lower half of IV reversed	VI IV+V	M	VII M×VI	IX IV−V	M	X M×IX	XII First half of III	XIII Second half of III	XIV XII+XIII	XV XII−XIII
0	11·879	12	11·989	23·868	−·110	...	−·110	0	·000	−·110	1	−·110	23·868	17·379	41·247	+6·489
1	11·703	13	11·804	23·507	−·101	+·130	+·029	S_1	+·008	−·231	S_5	−·223	23·507	17·713	41·220	+5·794
2	11·146	14	11·214	22·360	−·068	+·134	+·066	S_2	+·033	−·202	S_4	−·175	22·360	18·818	41·178	+3·542
3	10·366	15	10·390	20·756	−·024	+·089	+·065	S_3	+·046	−·113	S_3	−·080	20·756	20·427	41·183	+0·329
4	9·557	16	9·567	19·124	−·010	+·052	+·042	S_4	+·036	−·062	S_2	−·031	19·124	22·104	41·228	−2·980
5	8·947	17	8·942	17·889	+·005	+·011	+·016	S_5	+·015	−·006	S_1	−·002	17·889	23·356	41·245	−5·467
6	8·684	18	8·695	17·379	−·011	...	−·011	1	−·011	−·011	0	·000				
7	8·862	19	8·851	17·713	+·011											
8	9·435	20	9·383	18·818	+·052											
9	10·258	21	10·160	20·427	+·089											
10	11·119	22	10·985	22·104	+·134											
11	11·743	23	11·613	23·356	+·130											
								12	+0·127		12	−0·621		24	247·301	
								B_1 =	+0·0106		A_1 =	−0·0518		A_0 =	10·304	

Values of Multipliers (M)

0	= nat. sin. 0°	=	·00000
S_1	= nat. sin. 15°	=	·25882
S_2	= nat. sin. 30°	=	·50000
S_3	= nat. sin. 45°	=	·70711
S_4	= nat. sin. 60°	=	·86603
S_5	= nat. sin. 75°	=	·96593
1	= nat. sin. 90°	=	1·00000

XV	M	XVI M×XV	M	XVII M×XV	M	XVIII M×XV	M	XIX M×XV	XX First half of XIV	XXI Second half of XIV	XXII XX−XXI	M	XXIII M×XXII	M	XXIV M×XXII	XXV XX+XXI	M	XXVI M×XXV	M	XXVII M×XXV
+6·489	0	·000	1	+6·489	0	·000	1	+6·489	41·247	41·183	+·064	0	·000	1	+·064	82·430	0	·000	1	+82·430
+5·794	S_2	+2·897	S_4	+5·018	1	+5·794	0	·000	41·220	41·228	−·008	S_4	−·007	S_2	−·004	82·448	S_4	+71·402	$-S_2$	−41·224
+3·542	S_4	+3·067	S_2	+1·771	0	·000	−1	−3·542	41·178	41·245	−·067	S_4	−·058	$-S_2$	+·034	82·423	$-S_4$	−71·381	$-S_2$	−41·212
+0·329	1	+0·329	0	·000	−1	−0·329	0	·000												
−2·980	S_4	−2·581	$-S_2$	+1·490	0	·000	1	−2·980												
−5·467	S_2	−2·734	$-S_4$	+4·735	1	−5·467	0	·000												
	12	+0·978	12	+19·503	12	−0·002	12	−0·033				12	−0·065	12	+0·094		12	+0·021	12	−0·006
	B_2 =	+0·0815	A_2 =	+1·6253	B_6 =	−0·0002	A_6 =	−0·0028				B_4 =	−0·0054	A_4 =	+0·0078		B_8 =	+0·0018	A_8 =	−0·0005

Analysis of Series M.

h	I	h	II	III I+II	IV I−II	V Lower half of IV reversed	VI IV+V	M	VII M×VI	M	VIII M×VI	IX IV−V	M	X M×IX	M	XI M×IX	XII First half of III	XIII Second half of III	XIV XII+XIII	XV XII−XIII
0	13·877	12	14·108	27·985	−·231	...	−·231	0	·000	0	·000	−·231	1	−·231	1	−·231	27·985	13·661	41·646	+14·324
1	12·203	13	12·449	24·652	−·246	+·079	−·167	S_1	−·043	S_3	−·118	−·325	S_5	−·314	S_3	−·230	24·652	16·526	41·178	+8·126
2	10·034	14	10·180	20·214	−·146	−·073	−·219	S_2	−·110	1	−·219	−·073	S_4	−·063	0	·000	20·214	20·527	40·741	−0·313
3	8·029	15	8·066	16·095	−·037	−·156	−·193	S_3	−·136	S_3	−·136	+·119	S_3	+·084	$-S_3$	−·084	16·095	24·742	40·837	−8·647
4	6·660	16	6·640	13·300	+·020	−·161	−·141	S_4	−·122	0	·000	+·181	S_2	+·091	−1	−·181	13·300	27·943	41·243	−14·643
5	6·282	17	6·212	12·494	+·070	−·064	+·006	S_5	+·006	$-S_3$	−·004	+·134	S_1	+·035	$-S_3$	−·095	12·494	29·153	41·647	−16·659
6	6·858	18	6·803	13·661	+·055	...	+·055	1	+·055	−1	−·055	+·055	0	·000	0	·000				
7	8·231	19	8·295	16·526	−·064															
8	10·183	20	10·344	20·527	−·161															
9	12·293	21	12·449	24·742	−·156															
10	13·935	22	14·008	27·943	−·073															
11	14·616	23	14·537	29·153	+·079															
								12	−0·350	12	−0·532		12	−0·398	12	−0·821				
								B_1 =	−0·0291	B_3 =	−0·0443		A_1 =	−0·0332	A_3 =	−0·0684				

XV	M	XVI M×XV	M	XVII M×XV	M	XVIII M×XV	M	XIX M×XV	XX First half of XIV	XXI Second half of XIV	XXII XX−XXI	M	XXIII M×XXII	M	XXIV M×XXII	XXV XX+XXI	M	XXVI M×XXV	M	XXVII M×XXV
+14·324	0	·000	1	+14·324	0	·000	1	+14·324	41·646	40·837	+0·809	0	·000	1	+·809	82·483	0	·000	1	+82·483
+8·126	S_2	+4·063	S_4	+7·037	1	+8·126	0	·000	41·178	41·243	−0·065	S_4	−·056	S_2	−·033	82·421	S_4	+71·379	$-S_2$	−41·211
−0·313	S_4	−0·271	S_2	−0·157	0	·000	−1	+0·313	40·741	41·647	−0·906	S_4	−·785	$-S_2$	+·453	82·388	$-S_4$	−71·350	$-S_2$	−41·194
−8·647	1	−8·647	0	·000	−1	+8·647	0	·000												
−14·643	S_4	−12·681	$-S_2$	+7·322	0	·000	1	−14·643												
−16·659	S_2	−8·330	$-S_4$	+14·427	1	−16·659	0	·000												
	12	−25·866	12	+42·953	12	+0·114	12	−0·006				12	−0·841	12	+1·229		12	+0·029	12	+0·078
	B_2 =	−2·1555	A_2 =	+3·5794	B_6 =	+0·0095	A_6 =	−0·0005				B_4 =	−0·0701	A_4 =	+0·1025		B_8 =	+0·0024	A_8 =	+0·0065

FORMS FOR SHORT-PERIOD TIDES.

Analysis of Series K.

h	I	h	II	III I+II	IV I−II	V Lower half of IV reversed	VI IV+V	M	VII M×VI	IX IV−V	M	X M×IX	XII First half of III	XIII Second half of III	XIV XII+XIII	XV XII−XIII	M	XVII M×XV	M	XVI M×XV
0	9·059	12	11·060	20·119	−2·001	...	−2·001	0	·000	−2·001	1	−2·001	20·119	21·077	Not required	−0·958	0	·000	1	−0·958
1	9·007	13	11·317	20·324	−2·310	+1·630	−0·680	S_1	−0·176	−3·940	S_5	−3·806	20·324	20·879		−0·555	S_2	−0·278	S_4	−0·481
2	9·107	14	11·567	20·674	−2·460	+1·062	−1·398	S_2	−0·699	−3·522	S_4	−3·050	20·674	20·524		+0·150	S_4	+0·130	S_2	+0·075
3	9·299	15	11·683	20·982	−2·384	+0·453	−1·931	S_3	−1·365	−2·837	S_3	−2·006	20·982	20·259		+0·723	1	+0·723	0	·000
4	9·480	16	11·704	21·184	−2·224	−0·196	−2·420	S_4	−2·096	−2·028	S_2	−1·014	21·184	20·072		+1·112	S_4	+0·963	$-S_2$	−0·556
5	9·674	17	11·557	21·231	−1·883	−0·817	−2·700	S_5	−2·608	−1·066	S_1	−0·276	21·231	19·998		+1·233	S_2	+0·617	$-S_4$	−1·068
6	9·835	18	11·242	21·077	−1·407	...	−1·407	1	−1·407	−1·407	0	·000								
7	10·031	19	10·848	20·879	−0·817															
8	10·164	20	10·360	20·524	−0·196															
9	10·356	21	9·903	20·259	+0·453			12	−8·351		12	−12·153					12	+2·155	12	−2·988
10	10·567	22	9·505	20·072	+1·062			B_1 =	−0·6959		A_1 =	−1·0128					B_2 =	+0·1796	A_2 =	−0·2490
11	10·814	23	9·184	19·998	+1·630															

Analysis of Series O.

h	I	h	II	IV I−II	V Lower half of IV reversed	VI IV+V	M	VII M×VI	IX IV−V	M	X M×IX
0	10·006	12	10·537	−0·531	...	−0·531	0	·000	−0·531	1	−0·531
1	9·765	13	10·599	−0·834	+·386	−0·448	S_1	−0·116	−1·220	S_5	−1·178
2	9·693	14	10·611	−0·918	+·014	−0·904	S_2	−0·452	−0·932	S_4	−0·807
3	9·563	15	10·678	−1·115	−·250	−1·365	S_3	−0·965	−0·865	S_3	−0·612
4	9·665	16	10·728	−1·063	−·498	−1·561	S_4	−1·352	−0·565	S_2	−0·283
5	9·752	17	10·805	−1·053	−·768	−1·821	S_5	−1·759	−0·285	S_1	−0·074
6	9·888	18	10·814	−0·926	...	−0·926	1	−0·926	−0·926	0	·000
7	10·035	19	10·803	−0·768							
8	10·213	20	10·711	−0·498							
9	10·322	21	10·572	−0·250			12	−5·570		12	−3·485
10	10·417	22	10·403	+0·014			B_1 =	−0·4642		A_1 =	−0·2904
11	10·561	23	10·175	+0·386							

Analysis of Series P.

h	I	h	II	IV I−II	V Lower half of IV reversed	VI IV+V	M	VII M×VI	IX IV−V	M	X M×IX
0	10·060	12	10·516	− ·456	...	−0·456	0	·000	−·456	1	− ·456
1	10·009	13	10·645	− ·636	+·285	−0·351	S_1	−0·091	−·921	S_5	− ·890
2	10·001	14	10·727	− ·726	+·108	−0·618	S_2	−0·309	−·834	S_4	− ·722
3	9·965	15	10·777	− ·812	−·119	−0·931	S_3	−0·658	−·693	S_3	− ·490
4	9·933	16	10·770	− ·837	−·317	−1·154	S_4	−0·999	−·520	S_2	− ·260
5	9·935	17	10·752	− ·817	−·518	−1·335	S_5	−1·290	−·299	S_1	− ·077
6	9·953	18	10·641	− ·688	...	−0·688	1	−0·688	−·688	0	·000
7	10·007	19	10·525	− ·518							
8	10·114	20	10·431	− ·317							
9	10·184	21	10·303	− ·119			12	−4·035		12	−2·895
10	10·310	22	10·202	+ ·108			B_1 =	−0·3363		A_1 =	−0·2413
11	10·419	23	10·134	+ ·285							

Analysis of Series MS.

h	I	h	II	III I+II	XII First half of III	XIII Second half of III	XIV XII+XIII	XX First half of XIV	XXI Second half of XIV	XXII XX−XXI	M	XXIII M×XXII	M	XXIV M×XXII
0	10·435	12	10·538	20·973	20·973	20·736	41·709	41·709	40·701	+1·008	0	·000	1	+1·008
1	10·443	13	10·528	20·971	20·971	20·693	41·664	41·664	40·843	+0·821	S_4	+ ·711	S_2	+0·411
2	10·319	14	10·399	20·718	20·718	20·389	41·107	41·107	41·289	−0·182	S_4	− ·158	$-S_2$	+0·091
3	10·179	15	10·288	20·467	20·467	20·234	40·701							
4	10·183	16	10·244	20·427	20·427	20·416	40·843							
5	10·278	17	10·289	20·567	20·567	20·722	41·289				12	+0·553	12	+1·510
6	10·365	18	10·371	20·736							B_4 =	+0·0461	A_4 =	+0·1258
7	10·354	19	10·339	20·693										
8	10·236	20	10·153	20·389										
9	10·160	21	10·074	20·234										
10	10·237	22	10·179	20·416										
11	10·426	23	10·296	20·722										

FORMS FOR SHORT-PERIOD TIDES.

Analysis of Series L.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	10·296	12	10·283	20·579	20·555	+ ·024	0	·000	1	+ ·024
1	10·309	13	10·288	20·597	20·612	− ·015	S_2	− ·008	S_4	− ·013
2	10·428	14	10·366	20·794	20·703	+ ·091	S_4	+ ·079	S_2	+ ·046
3	10·408	15	10·342	20·750	20·506	+ ·244	1	+ ·244	0	·000
4	10·386	16	10·307	20·693	20·485	+ ·208	S_4	+ ·180	$-S_2$	− ·104
5	10·385	17	10·264	20·649	20·549	+ ·100	S_2	+ ·050	$-S_4$	− ·087
6	10·350	18	10·205	20·555						
7	10·382	19	10·230	20·612			12	+0·545	12	−0·134
8	10·432	20	10·271	20·703						
9	10·330	21	10·176	20·506			B_2 =	+0·0455	A_2 =	−0·0112
10	10·277	22	10·208	20·485						
11	10·328	23	10·221	20·549						

Analysis of Series N.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	11·187	12	11·170	22·357	18·894	+3·463	0	·000	1	+ 3·463
1	10·827	13	10·755	21·582	19·667	+1·915	S_2	+0·958	S_4	+ 1·658
2	10·311	14	10·233	20·544	20·690	−0·146	S_4	−0·126	S_2	− 0·073
3	9·810	15	9·742	19·552	21·686	−2·134	1	−2·134	0	·000
4	9·455	16	9·379	18·834	22·428	−3·594	S_4	−3·113	$-S_2$	+ 1·797
5	9·292	17	9·269	18·561	22·676	−4·115	S_2	−2·058	$-S_4$	+ 3·564
6	9·444	18	9·450	18·894						
7	9·846	19	9·821	19·667			12	−6·473	12	+10·409
8	10·380	20	10·310	20·690						
9	10·844	21	10·842	21·686			B_2 =	−0·5394	A_2 =	+ 0·8674
10	11·197	22	11·231	22·428						
11	11·320	23	11·356	22·676						

Analysis of Series J.

h	I	h	II	IV I−II	V Lower half of IV reversed	VI IV+V	M	VII M×VI	IX IV−V	M	X M×IX
0	10·297	12	10·338	− ·041	...	− ·041	0	·000	− ·041	1	− ·041
1	10·231	13	10·358	− ·127	+ ·074	− ·053	S_1	− ·014	− ·201	S_5	− ·194
2	10·236	14	10·364	− ·128	+ ·006	− ·122	S_2	− ·061	− ·134	S_4	− ·116
3	10·229	15	10·379	− ·150	− ·052	− ·202	S_3	− ·143	− ·098	S_3	− ·069
4	10·203	16	10·394	− ·191	− ·046	− ·237	S_4	− ·205	− ·145	S_2	− ·073
5	10·220	17	10·402	− ·182	− ·109	− ·291	S_5	− ·281	− ·073	S_1	− ·019
6	10·243	18	10·375	− ·132	...	− ·132	1	− ·132	− ·132	0	·000
7	10·257	19	10·366	− ·109							
8	10·282	20	10·328	− ·046			12	−0·836		12	−0·512
9	10·286	21	10·338	− ·052							
10	10·297	22	10·291	+ ·006			B_1 =	−0·0697		A_1 =	−0·0426
11	10·325	23	10·251	+ ·074							

Analysis of Series Q.

h	I	h	II	IV I−II	V Lower half of IV reversed	VI IV+V	M	VII M×VI	IX IV−V	M	X M×IX
0	10·251	12	10·343	− ·092	...	− ·092	0	·000	− ·092	1	− ·092
1	10·241	13	10·357	− ·116	+ ·124	+ ·008	S_1	+ ·002	− ·240	S_5	− ·232
2	10·228	14	10·351	− ·123	+ ·043	− ·080	S_2	− ·040	− ·166	S_4	− ·144
3	10·176	15	10·376	− ·200	− ·094	− ·294	S_3	− ·208	− ·106	S_3	− ·075
4	10·181	16	10·435	− ·254	− ·160	− ·414	S_4	− ·359	− ·094	S_2	− ·047
5	10·215	17	10·401	− ·186	− ·189	− ·375	S_5	− ·362	+ ·003	S_1	+ ·001
6	10·240	18	10·406	− ·157	...	− ·157	1	− ·157	− ·157	0	·000
7	10·229	19	10·418	− ·189							
8	10·223	20	10·383	− ·160			12	−1·124		12	−0·589
9	10·273	21	10·367	− ·094							
10	10·312	22	10·269	+ ·043			B_1 =	−0·0937		A_1 =	−0·0491
11	10·365	23	10·241	+ ·124							

Analysis of Series R.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	9·938	12	10·684	20·622	20·546	+ ·076	0	·000	1	+ ·076
1	10·133	13	10·475	20·608	20·511	+ ·097	S_2	+ ·049	S_4	+ ·084
2	10·342	14	10·280	20·622	20·501	+ ·121	S_4	+ ·105	S_2	+ ·061
3	10·514	15	10·085	20·599	20·503	+ ·096	1	+ ·096	0	·000
4	10·627	16	9·922	20·549	20·528	+ ·021	S_4	+ ·018	$-S_2$	− ·011
5	10·739	17	9·812	20·551	20·582	− ·031	S_2	− ·016	$-S_4$	+ ·027
6	10·827	18	9·719	20·546						
7	10·869	19	9·642	20·511			12	+0·252	12	+0·237
8	10·911	20	9·590	20·501	Means of 1884 and 1885					
9	10·932	21	9·571	20·503			B_2 =	+0·0210	A_2 =	+0·0198
10	10·908	22	9·620	20·528						
11	10·835	23	9·747	20·582						

Analysis of Series T.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	10·640	12	10·392	21·032	20·107	+ ·925	0	·000	1	+ ·925
1	10·579	13	10·337	20·916	20·211	+ ·705	S_2	+ ·353	S_4	+ ·611
2	10·469	14	10·251	20·720	20·397	+ ·323	S_4	+ ·280	S_2	+ ·162
3	10·341	15	10·126	20·467	20·643	− ·176	1	− ·176	0	·000
4	10·251	16	10·008	20·259	20·861	− ·602	S_4	− ·521	$-S_2$	+ ·301
5	10·183	17	9·937	20·120	21·001	− ·881	S_2	− ·441	$-S_4$	+ ·763
6	10·186	18	9·921	20·107						
7	10·218	19	9·993	20·211			12	−0·505	12	+ 2·762
8	10·266	20	10·131	20·397	Means of 1884 and 1885					
9	10·324	21	10·319	20·643			B_2 =	−0·0421	A_2 =	+ 0·2301
10	10·362	22	10·499	20·861						
11	10·389	23	10·612	21·001						

FORMS FOR SHORT-PERIOD TIDES.

Analysis of Series λ.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	10·263	12	10·403	20·666	20·613	+ ·053	0	·000	1	+ ·053
1	10·251	13	10·346	20·597	20·600	− ·003	S_2	− ·002	S_4	− ·003
2	10·258	14	10·310	20·568	20·635	− ·067	S_4	− ·058	S_2	− ·034
3	10·301	15	10·394	20·695	20·568	+ ·127	1	+ ·127	0	·000
4	10·263	16	10·311	20·574	20·765	− ·191	S_4	− ·165	$-S_2$	+ ·096
5	10·353	17	10·347	20·700	20·590	+ ·110	S_2	+ ·055	$-S_4$	− ·095
6	10·308	18	10·305	20·613						
7	10·319	19	10·281	20·600			12	−0·043	12	+0·017
8	10·372	20	10·263	20·635						
9	10·351	21	10·217	20·568			$B_2=$	−0·0035	$A_2=$	+0·0014
10	10·438	22	10·327	20·765						
11	10·376	23	10·214	20·590						

Analysis of Series ν.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	10·356	12	10·432	20·788	20·463	+ ·325	0	·000	1	+ ·325
1	10·392	13	10·423	20·815	20·475	+ ·340	S_2	+ ·170	S_4	+ ·294
2	10·283	14	10·318	20·601	20·610	− ·009	S_4	− ·008	S_2	− ·005
3	10·266	15	10·304	20·570	20·750	− ·180	1	− ·180	0	·000
4	10·279	16	10·323	20·602	20·653	− ·051	S_4	− ·044	$-S_2$	+ ·026
5	10·285	17	10·339	20·624	20·621	+ ·003	S_2	+ ·002	$-S_4$	− ·003
6	10·222	18	10·241	20·463						
7	10·222	19	10·253	20·475			12	−0·060	12	+ 0·637
8	10·312	20	10·298	20·610						
9	10·403	21	10·347	20·750			$B_2=$	−0·0050	$A_2=$	+ 0·0531
10	10·343	22	10·310	20·653						
11	10·341	23	10·280	20·621						

Analysis of Series μ or 2MS.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	10·458	12	10·354	20·812	20·456	+ ·356	0	·000	1	+ ·356
1	10·352	13	10·216	20·568	20·660	− ·092	S_2	− ·046	S_4	− ·080
2	10·219	14	10·135	20·354	20·844	− ·490	S_4	− ·424	S_2	− ·245
3	10·152	15	10·081	20·233	20·911	− ·678	1	− ·678	0	·000
4	10·168	16	10·072	20·240	21·013	− ·773	S_4	− ·669	$-S_2$	+ ·387
5	10·159	17	10·160	20·319	20·901	− ·582	S_2	− ·291	$-S_4$	+ ·504
6	10·212	18	10·244	20·456						
7	10·335	19	10·325	20·660			12	− 2·108	12	+0·922
8	10·408	20	10·436	20·844						
9	10·418	21	10·493	20·911			$B_2=$	− 0·1757	$A_2=$	+0·0768
10	10·475	22	10·538	21·013						
11	10·420	23	10·481	20·901						

Analysis of Series 2SM.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	10·314	12	10·277	20·591	20·621	− ·030	0	·000	1	− ·030
1	10·341	13	10·299	20·640	20·597	+ ·043	S_2	+ ·022	S_4	+ ·037
2	10·344	14	10·337	20·681	20·508	+ ·173	S_4	+ ·150	S_2	+ ·087
3	10·346	15	10·350	20·696	20·530	+ ·166	1	+ ·166	0	·000
4	10·288	16	10·394	20·682	20·511	+ ·171	S_4	+ ·148	$-S_2$	− ·086
5	10·326	17	10·367	20·693	20·563	+ ·130	S_2	+ ·065	$-S_4$	− ·113
6	10·234	18	10·387	20·621						
7	10 267	19	10·330	20·597			12	+0·551	12	− 0·105
8	10·183	20	10·325	20·508						
9	10·222	21	10·308	20·530			$B_2=$	+0·0459	$A_2=$	− 0·0088
10	10·207	22	10·304	20·511						
11	10·260	23	10·303	20·563						

Analysis of Series 2N.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	10·191	12	10·431	20·622	20·541	+ ·081	0	·000	1	+ ·081
1	9·998	13	10·490	20·488	20·704	− ·216	S_2	− ·108	S_4	− ·187
2	9·839	14	10·555	20·394	20·875	− ·481	S_4	− ·417	S_2	− ·241
3	9·696	15	10·595	20·291	20·944	− ·653	1	− ·653	0	·000
4	9·655	16	10·657	20·312	20·888	− ·576	S_4	− ·499	$-S_2$	+ ·288
5	9·698	17	10·744	20·442	20·815	− ·373	S_2	− ·187	$-S_4$	+ ·323
6	9·758	18	10·783	20·541						
7	9·865	19	10·839	20·704			12	−1·864	12	+0·264
8	10·027	20	10·848	20·875						
9	10·184	21	10·760	20·944			$B_2=$	−0·1553	$A_2=$	+0·0220
10	10·253	22	10·635	20·888						
11	10·388	23	10·427	20·815						

Analysis of Series M_2N.

h	I	h	II	III I+II	XIII Second half of III	XV III−XIII	M	XVI M×XV	M	XVII M×XV
0	10·161	12	10·146	20·307	20·939	− ·632	0	·000	1	− ·632
1	10·165	13	10·105	20·270	20·880	− ·610	S_4	− ·528	S_2	− ·305
2	10·199	14	10·191	20·390	20·762	− ·372	S_4	− ·322	$-S_2$	+ ·186
3	10·266	15	10·253	20·519	20·680	− ·161	0	·000	−1	+ ·161
4	10·395	16	10·390	20·785	20·493	+ ·292	$-S_4$	− ·253	$-S_2$	− ·146
5	10·425	17	10·463	30·888	20·397	+ ·491	$-S_4$	− ·425	S_2	+ ·246
6	10·470	18	10·469	20·939						
7	10·441	19	10·439	20·880			12	−1·528	12	− 0·490
8	10·399	20	10·363	20·762						
9	10·355	21	10·325	20·680			$B_4=$	−0·1273	$A_4=$	− 0·0409
10	10·244	22	10·249	20·493						
11	10·190	23	10·207	20·397						

FORMS FOR SHORT-PERIOD TIDES.

Analysis of Series M_2K_1.

h	I	h	II	IV I − II	V Lower half of IV reversed	VI IV + V	M	VII M × VI	IX IV − V	M	X M × IX
0	10·393	12	10·260	+ ·133	...	...	0	·000	+ ·133	1	+ ·133
1	10·301	13	10·331	− ·030	− ·162	− ·192	S_3	− ·136	+ ·132	S_3	+ ·093
2	10·239	14	10·425	− ·186	− ·193	− ·379	1	− ·379	+ ·007	0	·000
3	10·273	15	10·431	− ·158	− ·053	− ·211	S_3	− ·149	− ·105	$-S_3$	+ ·074
4	10·294	16	10·368	− ·074	+ ·059	− ·015	0	·000	− ·133	−1	+ ·133
5	10·309	17	10·272	+ ·037	+ ·168	+ ·205	$-S_3$	− ·145	− ·131	$-S_3$	+ ·093
6	10·372	18	10·218	+ ·154	...	+ ·154	−1	− ·154	·000	0	·000
7	10·358	19	10·190	+ ·168							
8	10·275	20	10·216	+ ·059							
9	10·232	21	10·285	− ·053			12	−0·963		12	+0·526
10	10·208	22	10·401	− ·193							
11	10·249	23	10·411	− ·162			B_3 =	−0·0803		A_3 =	+0·0438

Analysis of Series $2M_2K_1$.

h	I	h	II	IV I − II	V Lower half of IV reversed	VI IV + V	M	VII M × VI	IX IV − V	M	X M × IX
0	10·378	12	10·415	− ·037	...	− ·037	0	·000	− ·037	1	− ·037
1	10·378	13	10·436	− ·058	+ ·008	− ·050	S_3	− ·035	− ·066	S_3	− ·047
2	10·307	14	10·446	− ·139	− ·104	− ·243	1	− ·243	− ·035	0	·000
3	10·376	15	10·407	− ·031	− ·164	− ·195	S_3	− ·138	+ ·133	$-S_3$	− ·094
4	10·365	16	10·256	+ ·109	− ·009	+ ·109	0	·000	+ ·118	−1	− ·118
5	10·334	17	10·205	+ ·129	+ ·044	+ ·173	$-S_3$	− ·122	+ ·085	$-S_3$	− ·060
6	10·270	18	10·186	+ ·084	...	+ ·084	−1	− ·084	+ ·084	0	·000
7	10·234	19	10·190	+ ·044							
8	10·195	20	10·204	− ·009							
9	10·178	21	10·342	− ·164			12	−0·622		12	−0·356
10	10·230	22	10·334	− ·104							
11	10·326	23	10·318	+ ·008			B_3 =	−0·0518		A_3 =	−0·020

VALUES OF $V_0 + u$ FOR BOMBAY.

1885, 1st January, 0^h. Lat. 18° 55′ N., Long. 72° 50′ E. (= $4^h·856$).

Average Long. Moon's Node for year beginning with 0^h, 1st January 1885, Date of mid-year = 2—3 July 1885

Auxiliary Tables N = 179°·557.

Extract from Auxiliary Tables.

I = 18°·309, ν = +0°·127, ξ = +0°·118.

For K Tides ν' = +0·017, $2\nu''$ = +0·031.

Average Long. Moon's Perigee for L Tide (round numbers).

(*from below*) p_0	=	84°·144
motion in $184^d\ 13\frac{1}{2}^h$	=	20·560
$P + \xi$	=	104·704
$-\xi$	=	359·882
P	=	104·586
$\cot\frac{1}{2}I$	=	+ 6·205
$\cot^2\frac{1}{2}I$	=	+38·502
$\frac{1}{6}\cot^2\frac{1}{2}I$	=	+ 6·417
$-\cos 2P$	=	+ 0·873
$\frac{1}{6}\cot^2\frac{1}{2}I - \cos 2P$	=	+ 7·290

Computation of R and Q (round numbers).

colog $[\frac{1}{6}\cot^2\frac{1}{2}I - \cos 2P]$	=	+9·13727
log sin $2P$	=	−9·68791
log tan R	=	−8·82518
for L Tide, R	=	356°·175
log tan P	=	−10·58466
log $\frac{1}{2}$	=	9·69897
log tan Q	=	−0·28363
for M_1 Tide, Q	=	117°·494

1885, 1st January, 0^h. Mean Time at Greenwich.

		h_0 h m s
Sid. Time at Mean Noon (*Naut. Alm.*, p. II.)	=	18 45 12·37
	=	18 45·2061
	=	18·753435
	=	281·302
East Long. Correction	=	−0·199
h_0	=	281·103
ν	=	0·127
$h_0 - \nu$	=	280·076
$2h_0$	=	202·206

		s_0 ° ′
Moon's mean longitude (*Nautical Almanac*)	=	103 19·1
	=	103·318
East Long. Correction	=	−2·667
s_0	=	100·651
ξ	=	0·118
$s_0 - \xi$	=	100·533
$2s_0 - 2\xi$	=	201·066
$2s_0$	=	201·302

		p_0 °
Hansen's Tables de la Lune, p. 300. π for 1885, Jan. 0.	=	83·920
Motion in interval from Jan. 0, or 1 day.	=	0·111
Constant	=	0·136
Sum	=	84·167
East Long. Correction	=	0·023
p_0	=	84·144
s_0	=	100·651
$s_0 - p_0$	=	16·507

		p_1 °
Extract from Auxiliary Tables: p_1	=	280·969
h_0	=	281·103
$h_0 - p_1$	=	0·134

Motion per mean Solar hour.	East Long. Correction.
η = 0°·0410686	(−0°·199)
σ = 0°·5490165	(−2 ·667)
ϖ = 0°·0046418	(−0 ·023)

FORMS FOR SHORT-PERIOD TIDES.

VALUES OF $V_0 + u$ FOR BOMBAY—(*Continued*).

M SERIES.

$h_0 - \nu$ = 280°·976
$-(s_0 - \xi)$ = 259·467

§ M_1 = 180·443
(× 2) for M_2 = 0·886
(× 3) for M_3 = 181·329
(× 4) for M_4 = 1·772
(× 6) for M_6 = 2·658
(× 8) for M_8 = 3·544

§ as above M_1 = 180·443
(*see above*) + Q = 117·494
$-\frac{1}{2}\pi$ = 270·000

for M_1 = 207·937

S SERIES.

All zero.

R SERIES.

$h_0 - p_1$ = 0°·134
$+\pi$ = 180·000

for R = 180·134

T SERIES.

for T, $-(h_0 - p_1)$ = 359°·866

P SERIES.

$-h_0$ = 78°·897
$+\frac{1}{2}\pi$ = 90·000

for P = 168·897

K_2 SERIES.

$2h_0$ = 202°·206
$-2\nu''$ = 359·969

for K_2 = 202·175

K_1 SERIES.

h_0 = 281°·103
$-\nu'$ = 359·983
$-\frac{1}{2}\pi$ = 270·000

for K_1 = 191·086

L SERIES.

for M_2 = 0°·886
$+(s_0 - p_0)$ = 16·507
$+\pi$ = 180·000
(*see above*) − R = 3·825

for L = 201·218

N SERIES.

for M_2 = 0°·886
$-(s_0 - p_0)$ = 343·493

for N = 344·379

2N SERIES.

for N = 344°·379
$-(s_0 - p_0)$ = 343·493

for 2N = 327·872

λ SERIES.

for N = 344°·379
$-2h_0$ = 157·794
$+2s_0$ = 201·302
$+\pi$ = 180·000

for λ = 163·475

ν SERIES.

for M_2 = 0°·886
$+(s_0 - p_0)$ = 16·507
$+2h_0$ = 202·206
$-2s_0$ = 158·698

for ν = 18·297

O SERIES.

$h_0 - \nu$ = 280°·976
$-(2s_0 - 2\xi)$ = 158·934
$+\frac{1}{2}\pi$ = 90·000

for O = 169·910

Q SERIES.

for O = 169°·910
$-(s_0 - p_0)$ = 343·493

for Q = 153·403

J SERIES.

$h_0 - \nu$ = 280°·976
$+(s_0 - p_0)$ = 16·507
$-\frac{1}{2}\pi$ = 270·000

for J = 207·483

M_2N SERIES.

for M_2 = 0°·886
+ for N = 344·379

for M_2N = 345·265

$2M_2K_1$ SERIES.

for M_4 = 1°·772
− for K_1 = 168·914

for $2M_2K_1$ = 170·686

M_2K_1 SERIES.

for M_2 = 0°·886
+ for K_1 = 191·086

for M_2K_1 = 191·972

MS as for M_2 = 0°·886

2MS as for M_4 = 1°·772

2SM as for $-M_2$ = 359°·114

Mm SERIES.

$s_0 - p_0$ = 16°·507

Mf SERIES.

$(2s_0 - 2\xi)$ = 201°·066

MSf as for 2SM = 359°·114

Sa SERIES.

h_0 = 281°·103

Ssa SERIES.

$2h_0$ = 202°·206

EVALUATION OF SHORT-PERIOD TIDES.

SERIES S.

Log B_1 = +8·02531	Log B_2 = +8·91116	Log B_4 = −7·73239	Log B_6 = −6·30103	Log B_8 = +7·25527
Log A_1 = −8·71433	Log A_2 = +0·21093	Log A_4 = +7·89209	Log A_6 = −7·44716	Log A_8 = −6·69897
L tan κ_1 = −9·31098	L tan κ_2 = +8·70023	L tan κ_4 = −9·84030	L tan κ_6 = +8·85387	L tan κ_8 = −0·55630
κ_1 = 168°·435	κ_2 = 2°·871	κ_4 = 325°·305	κ_6 = 184°·086	κ_8 = 105°·524
$(B_1)^2$ = 0·00011236	$(B_2)^2$ = 0·00664225	$(B_4)^2$ = 0·00002916	$(B_6)^2$ = 0·00000004	$(B_8)^2$ = 0·00000324
$(A_1)^2$ = 0·00268324	$(A_2)^2$ = 2·64160009	$(A_4)^2$ = 0·00006084	$(A_6)^2$ = 0·00000784	$(A_8)^2$ = 0·00000025
$(H_1)^2$ = 0·00279560	$(H_2)^2$ = 2·64824234	$(H_4)^2$ = 0·00009000	$(H_6)^2$ = 0·00000788	$(H_8)^2$ = 0·00000349
H_1 = 0·0529	H_2 = 1·6273	H_4 = 0·0095	H_6 = 0·0028	H_8 = 0·0019

SERIES R.	SERIES T.
Log B_2 = +8·32222	Log B_2 = −8·62428
Log A_2 = +8·29667	Log A_2 = +9·36192
L tan ζ_2 = +0·02555	L tan ζ_2 = −9·26236
ζ_2 = 46°·684	ζ_2 = 349°·632
$V_0 + u$ = 180·134	$V_0 + u$ = 359·866
κ_2 = 226·818	κ_2 = 349·498
$(B_2)^2$ = 0·00044100	$(B_2)^2$ = 0·00177241
$(A_2)^2$ = 0·00039204	$(A_2)^2$ = 0·05294601
$(R_2)^2$ = 0·00083304	$(R_2)^2$ = 0·05471842
R_2 = 0·0289	R_2 = 0·2339
Aug^{tn} = 0·0003	Aug^{tn} = 0·0027
Aug^{td} R_2 or H_2 = 0·0292	Aug^{td} R_2 or H_2 = 0·2366

Augmenting Factors.—For A_1, B_1 . . 1·00286, A_2, B_2 . . 1·01152, A_3, B_3 . . 1·02617, A_4, B_4 . . 1·04720, A_6, B_6 . . 1·11072, A_8, B_8 . . 1·20920.

FORMS FOR SHORT-PERIOD TIDES.

EVALUATION OF SHORT-PERIOD TIDES—(*Continued*).

SERIES M.

	M_1	M_2	M_3	M_4	M_6	M_8
Log B	−8·46389	−0·33355	−8·64640	−8·84572	+7·97772	+7·38021
Log A	−8·52114	+0·55381	−8·83506	+9·01072	−6·69897	+7·81291
L tan ζ	+9·94275	−9·77974	+9·81134	−9·83500	−1·27875	+9·56730
ζ	221°·234	328°·944	212°·929	325°·631	93°·013	20°·266
$V_0 + u$	207·937	0·886	181·329	1·772	2·658	3·544
κ	69·171	329·830	34·258	327·403	95·671	23·810
$(B)^2$	0·00084681	4·64618025	0·00196249	0·00491401	0·00009025	0·00000576
$(A)^2$	0·00110224	12·81210436	0·00467856	0·01050625	0·00000025	0·00004225
$(R)^2$	0·00194905	17·45828461	0·00664105	0·01542026	0·00009050	0·00004801
R	0·0441	4·1783	0·0815	0·1242	0·0095	0·0069
Aug^tn	0·0001	0·0481	0·0021	0·0059	0·0011	0·0014
Aug^td R	0·0442	4·2264	0·0836	0·1301	0·0106	0·0083
$\frac{1}{f}$	1·1377	0·9635	0·9458	0·9283	0·8944	0·8618
H	0·0503	4·0721	0·0791	0·1208	0·0095	0·0072

	SERIES K. K_1	SERIES K. K_2	SERIES O. O_1	SERIES P. P_1	SERIES J. J_1	SERIES Q. Q_1
Log B	−9·84255	+9·25431	−9·66671	−9·52673	−8·84323	−8·97174
Log A	−0·00552	−9·39620	−9·46300	−9·38256	−8·62941	−8·69108
L tan ζ	+9·83703	−9·85811	+0·20371	+0·14417	+0·21382	+0·28066
ζ	214°·494	144°·197	237°·970	234°·340	238°·567	242°·345
$V_0 + u$	191·086	202·175	169·910	168·897	207·483	153·403
κ	45·580	346·372	47·880	43·237	86·050	35·748
$(B)^2$	0·48427681	0·03225616	0·21548164	0·11309769	0·00485809	0·00877969
$(A)^2$	1·02576384	0·06200100	0·08433216	0·05822569	0·00181476	0·00241081
$(R)^2$	1·51004065	0·09425716	0·29981380	0·17132338	0·00667285	0·01119050
R	1·2288	0·3070	0·5476	0·4139	B₁ = 0·0817	0·1058
Aug^tn	0·0034	0·0035	0·0015	0·0012	0·0002	0·0003
Aug^td R	1·2322	0·3105	0·5491	Aug^td R₁ or H₁ = 0·4151	0·0819	0·1061
$\frac{1}{f}$	1·1342	1·3376	1·2412		1·2095	1·2412
H	1·3976	0·4153	0·6815		0·0991	0·1317

FORMS FOR SHORT-PERIOD TIDES.

EVALUATION OF SHORT-PERIOD TIDES—(*Continued*).

	SERIES L.	SERIES N.	SERIES 2N.	SERIES λ.	SERIES ν.
$\log B_2$ =	+8·65801	−9·73191	−9·19117	−7·54407	−7·69897
$\log A_2$ =	−8·04922	+9·93822	+8·34242	+7·14613	+8·72509
$L \tan \zeta_2$ =	−0·60879	−9·79369	−0·84875	−0·39794	−8·97388
ζ_2 =	103°·829	328°·124	278°·063	291°·801	354°·621
$V_0 + u$ =	201·218	344·379	327·872	163·475	18·297
κ_2 =	305·047	312·503	245·935	95·276	12·918
$(B_2)^2$ =	0·00207025	0·29095236	0·02411809	0·00001225	0·00002500
$(A_2)^2$ =	0·00012544	0·75238276	0·00048400	0·00000196	0·00281961
$(R_2)^2$ =	0·00219569	1·04333512	0·02460209	0·00001421	0·00284461
R_2 =	0·0469	1·0214	0·1569	0·0038	0·0533
Aug^{tn} =	0·0005	0·0117	0·0018	0·0000	0·0006
Aug^{td} R_2 =	0·0474	1·0331	0·1587	0·0038	0·0539
$\frac{1}{f}$ =	0·8543	0·9635	0·9635	0·9635	0·9635
H_2 =	0·0405	0·9954	0·1529	0·0037	0·0519

SERIES μ OR 2MS.	
$\log B_2$ =	−9·24477
$\log A_2$ =	+8·88536
$L \tan \zeta_2$ =	−0·35941
ζ_2 =	293°·611
$V_0 + u$ =	1·772
κ_2 =	295·383
$(B_2)^2$ =	0·03087049
$(A_2)^2$ =	0·00589824
$(R_2)^2$ =	0·03676873
R_2 =	0·1918
Aug^{tn} =	0·0022
Aug^{td} R_2 =	0·1940
$\frac{1}{f}$ =	0·9283
H_2 =	0·1801

SERIES 2SM.	
$\log B_2$ =	+8·66181
$\log A_2$ =	−7·94448
$L \tan \zeta_2$ =	−0·71733
ζ_2 =	100°·853
$V_0 + u$ =	359·114
κ_2 =	99·967
$(B_2)^2$ =	0·00210681
$(A_2)^2$ =	0·00007744
$(R_2)^2$ =	0·00218425
R_2 =	0·0467
Aug^{tn} =	0·0005
Aug^{td} R_2 =	0·0472
$\frac{1}{f}$ =	0·9635
H_2 =	0·0455

SERIES MS.	
$\log B_4$ =	+8·66370
$\log A_4$ =	+9·09968
$L \tan \zeta_4$ =	+9·56402
ζ_4 =	20°·126
$V_0 + u$ =	0·886
κ_4 =	21·012
$(B_4)^2$ =	0·00212521
$(A_4)^2$ =	0·01582564
$(R_4)^2$ =	0·01795085
R_4 =	0·1340
Aug^{tn} =	0·0063
Aug^{td} R_4 =	0·1403
$\frac{1}{f}$ =	0·9635
H_4 =	0·1352

SERIES M_2N.	
$\log B_4$ =	−9·10483
$\log A_4$ =	−8·61172
$L \tan \zeta_4$ =	+0·49311
ζ_4 =	252°·189
$V_0 + u$ =	345·265
κ_4 =	237·454
$(B_4)^2$ =	0·01620529
$(A_4)^2$ =	0·00167281
$(R_4)^2$ =	0·01787810
R_4 =	0·1337
Aug^{tn} =	0·0063
Aug^{td} R_4 =	0·1400
$\frac{1}{f}$ =	0·9283
H_4 =	0·1300

SERIES $2M_2K_1$.	
$\log B_3$ =	−8·71433
$\log A_3$ =	−8·47276
$L \tan \zeta_3$ =	+0·24157
ζ_3 =	240°·172
$V_0 + u$ =	170·686
κ_3 =	50·858
$(B_3)^2$ =	0·00268324
$(A_3)^2$ =	0·00088209
$(R_3)^2$ =	0·00356533
R_3 =	0·0597
Aug^{tn} =	0·0016
Aug^{td} R_3 =	0·0613
$\frac{1}{f}$ =	1·0529
H_3 =	0·0645

SERIES M_2K_1.	
$\log B_3$ =	−8·90472
$\log A_3$ =	+8·64147
$L \tan \zeta_3$ =	−0·26325
ζ_3 =	298°·610
$V_0 + u$ =	191·972
κ_3 =	130·582
$(B_3)^2$ =	0·00644809
$(A_3)^2$ =	0·00191844
$(R_3)^2$ =	0·00836653
R_3 =	0·0915
Aug^{tn} =	0·0024
Aug^{td} R_3 =	0·0939
$\frac{1}{f}$ =	1·0928
H_3 =	0·1026

FORMS FOR LONG-PERIOD TIDES.

TIDE Mm.

$\Sigma dh \sin (\sigma - \varpi)\, t.$

Multiplier	1·0		·9		·8		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
7 to 0	·74 ·66	. .	·65	.	·49	.			·32	.			·26	.			·03	.			·03
8— 13	·35	.	·25	.	·18	.			·23	.			·22	.			·22	.			
34— 28	·41	.	·33	.	·16	.	.	·08			.	·04			.	·11			.	·13	
35— 41	·30	.	·05	.	.	·11	.	·19			.	·30			.	·37			.	·43	
62— 56	. .	·21 ·15	.	·42	.	·38			.	·39			.	·28			.	·20			
63— 68	.	·07	·08	.	·20	.			·34	.			·27	.			·06	.			
89— 83	·23	.	·23	.	·05	.	·07	.			·10	.			·18	.			·32	.	
90— 96	·19	.	·24	.	·33	.	·47	.			·36	.			·23	.			·10	.	
117—111	. .	·32 ·28	.	·29	.	·12			.	·00			·15	.			·13	.			
118—124	.	·38	.	·27	.	·41			.	·35			.	·24			.	·13			·07
144—138	.	·18	.	·25	.	·36	.	·32			.	·07			·07	.					·04
145—151	.	·29	. .	·24 ·16			.	·09			.	·04			·05	.					
172—166	·49 ·42	. .	·50	.			·53	.	·58	.			·43	.					·05	.	
173—179	·09	.	.	·16	.	·38			.	·51	.	·44					.	·54	·26	.	·63
200—193	·13 ·22	. .	·28	.	·18	.			·17	.	.	·03					.	·35			·47
201—206	·34	.	·28	.			·16	.	·16	.			·15	.					·16	.	
227—221	·23	.	·18 ·15	. .			.	·07			.	·14			.	·07			·24	.	
228—234	·24	.	·31	.	·50	.	·29	.			·13	.			·22	.					·23
255—248	. .	·07 ·05	.	·28	.	·37			.	·47			.	·48			.	·30			·04
256—261	.	·07	.	·24	.	·31			.	·28			.	·18			.	·25			
282—276	·05	.	·16	.	·25	.	·21	.			·43	.			·47	.			·47	.	
283—289	.	·15	.	·10	.	·09	.	·24			.	·21			.	·22			.	·10	
310—304	. .	·09 ·19	.	·08	.	·05			·11	.			·15	.			·13	.			
311—316	.	·27	.	·23	.	·07			.	·03			.	·01			·02	.			
337—331	·05	.	·05	.	·04	.	·17	.			·15	.			·04	.			.	·13	
338—344	·01	.	·10	.	·12	.	·07	.			·16	.			·08	.			.	·15	
364—350	.	·17	.	·17	.	·16			.	·17			.	·13			.	·19			
Total a	5·16	2·94	3·84	2·89	2·50	2·81	1·97	0·99	1·91	2·20	1·53	1·27	1·63	1·32	1·34	0·77	0·59	1·96	1·60	0·94	
	+2·22		+0·95		−0·31		+0·98		−0·29		+0·06		+0·31		+0·57		−1·37		+0·66		

	20 to 14	·07	·	·	·12	·	·21	·	·02			·	·00			·	·07					·02	←
→	21–27	·26	·	·39 ·39	:			·35	·			·23	·			·09	·			·	·08		
	48–42	:	·42 ·35	·	·24			·	·27	·	·34			·	·18					·	·20		←
→	49–55	·	·15	·	·07	·	·15			·	·28	·	·37					·	·46			·29	
	76–69	:	·36 ·28	·	·53	·	·34			·	·24	·	·22					·	·02			·03	←
→	77–82	·	·12	·02	·			·19	·	·54	·			·53	·					·55	·		
	103–97	·	·34	·10 ·	· ·12			·27	·			·29	·			·20	·			·16	·		←
→	104–110	·	·41	·	·29	·	·05	·	·02			·12	·			·	·01					·05	
	131–125	·02 ·	· ·10	·09	·	·13	·			·00	·			·10	·			·	·00				←
→	132–137	·	·28	·	·45	·	·53			·	·51			·	·30			·	·03				
	158–152	1·78	·	·92	·	·67	·	·46	·			·31	·			·13	·			·03	·		←
→	159–165	1·93	·	1·34	·	·77	·	·34	·			·16	·			·12	·			·04	·		
	186–180	:	·15 ·26	·	·17	·	·19			·	·41			·	·61			·	·58				←
→	187–192	·	·14	·	·17	·	·36			·	·50			·	·58			·	·59				
	213–207	·11	·	·10	·	·	·04	·	·01			·	·10			·08	·			·02	·		←
→	214–220	·20	·	·47	·	·40	·	·45	·			·56	·			·31	·			·27	·		
	241–235	·13 ·09	:	·14	·	·10	·			·16	·			·07	·			·09	·				←
→	242–247	·18	·	·03	·	·16	·			·19	·			·25	·			·17	·				
	268–262	·	·24	·	·22	·	·28	·	·25			·	·36			·	·42					·21	←
→	269–275	·	·18	:	·16 ·16			·	·05			·07	·			·21	·			·18	·		
	296–290	·02 ·01	:	·06	·			·	·06	·07	·			·02	·					·	·05		←
→	297–303	·05	·	·	·09	·	·05			·15	·	·17	·					·21	·			·16	
	324–317	:	·39 ·58	·	·09	·04	·			·13	·	·17	·					·22	·			·09	←
→	325–330	·	·80	·	·68			·	·64	·	·58			·	·46					·	·20		
	351–345	·	·23	·24 ·07	:			·32	·			·30	·			·20	·			·	·15		←
→	352–358	·	·19	·	·07	·	·19	·	·33			·	·35			·	·52					·33	
		4·85	5·97	4·36	3·63	2·27	2·39	2·38	1·65	1·24	2·86	2·38	1·40	0·97	2·13	1·34	1·02	0·69	1·68	1·25	0·68		
	Total *b*	−1·12		+0·73		−0·12		+0·73		−1·62		+0·98		−1·16		+0·32		−0·99		+0·57			
	$a-b$	+3·34		+0·22		−0·19		+0·25		+1·33		−0·92		+1·47		+0·25		−0·38		+0·09			
	$(a-b)\times$Mult. +	+3·34		+0·20		+ ·		+0·18		+0·80		+ ·		+0·59		+0·07		+ ·		+0·01			
	$(a-b)\times$Mult. −	− ·		− ·		−0·15		− ·		− ·		−0·46		− ·		− ·		−0·08		− ·			

$\Sigma(a-b)\times$ Mult. $= +5\cdot19$ $\Sigma(a-b)\times$ Mult. $= -0\cdot69$ $\Sigma dh \sin(\sigma-\varpi)t = \Sigma''_{364}(a-b)\times$ Mult. $= +4\cdot50$

NOTE.—The arrows show the direction of the sequence of the entries of *dh* in the columns in which points are inserted, the values being entered under their proper signs—*e.g.*, in the first row (marked 7 to 0) with arrow from right to left, the entry (irrespective of sign) for day 0 is to be entered in column 0, for day 1 in column ·2, for day 2 in column ·4, and so on. After filling in the first two rows of the upper half, the first two rows of the lower half are to be filled, and so on alternately, the alternation of entry being indicated by the curved arrows. In the spaces containing double points two successive entries are to be filled in—the first entry above, the second below; *e.g.*, in row 7 to 0, column 1·0, there are double points, and the entry of *dh* for day 6 is to be made above the line and to left or right according as it is + or −, and for day 7 it is to be made below the line, and to left or right according as it is + or −.

FORMS FOR LONG-PERIOD TIDES.

Tide Mm. $\Sigma dh \cos(\sigma - \varpi)t$.

Multiplier	1·0		·9		·8		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
0 to 6	·03 ·03		·26		·32				·49				·65				·74				
27—21		·08	·09		·23		·35				·39				·39				·26		
28—34		·13		·11		·04		·08			·16				·33				·42		
55—40		·46 ·39		·37		·28				·15				·07				·15			
56—62		·20		·28		·39				·38				·42				·21			·15
82—76	·55		·53		·54		·19				·02					·12					·28
83—89	·32		·18 ·10				·07				·05				·23				·23		
110—104	·05	·01	·12					·02		·05				·29						·41	
111—117	·13		·15			·00				·12		·29						·32			·28
137—131		·03		·30		·51				·53		·45						·28			·10
138—144	·04 ·07			·07				·32		·36				·25						·18	
165—159	·04		·16 ·12				·34				·77				1·34				1·93		
166—172	·26		·43		·58		·53				·50				·49						·42
192—187		·59		·58		·50				·36				·17				·14			
193—199		·47 ·35		·03	·17				·18				·28				·13				
220—214	·27		·31		·56		·45				·40				·47				·20		
221—227	·24			·07		·14		·07			·18				·15				·23		
247—242	·17		·25		·19				·16				·03				·18				
248—254		·04 ·30		·48		·47				·37				·28				·07			
275—269	·18		·21		·07			·05				·16				·16				·18	
276—282	·47		·47		·43		·21				·25				·16				·05		
303—297	·21 ·16		·17		·15					·05				·09			·05				
304—310	·13		·15		·11					·05				·08				·09			·19
330—324		·20		·46		·58		·64				·68				·80					·58
331—337		·13	·04 ·15				·17				·04				·05				·05		
358—352		·52 ·33		·35				·33		·19				·07						·19	
359—364		·19		·13		·17				·16		·17						·17			
	3·35	4·32	3·89	3·23	3·35	3·08	2·31	1·51	0·83	2·77	2·76	1·75	0·96	1·72	3·61	1·08	1·10	1·43	3·37	0·96	
Total a	−0·97		+0·66		+0·27		+0·80		−1·94		+1·01		−0·76		+2·53		−0·33		+2·41		

13 to 7	·22	·	·22	·	·23	·			·18	·	·25	·					·35	·			·66
14—20	·02	·07	·	·00			·	·02	·	·21			·	·12					·07	·	—
41—35	·	·43	:	·30 ·37			·	·19			·	·11			·05	·			·30	·	
42—48	·	·20	·	·18	·	·34	·	·27			·	·24			·	·42					·35
68—63	·06	·	·27	·	·34	·			·20	·			·08	·			·	·07			
69—75	·03	·02	·	·22	·	·24			·	·34			·	·53			·	·36			—
96—90	·10	·	·23	·	·36	·	·47	·			·33	·			·24	·			·19	·	
97—103	·16	·	·20	·	·29	·	·27	·			·10	·			·	·12			·	·34	—
124—118	:	·13 ·07	·	·24	·	·35			·	·41			·	·27			·	·38			
125—130	·	·00	·10	·	·00	·			·13	·			·09	·			·02	·			—
151—145	·05	·	·05	·	·	·04	·	·09			·	·16			·	·24			·	·29	
152—158	·03	·	·13	·	·31	·	·46	·			·67	·			·92	·			1·78	·	—
179—173	:	·54 ·63	·	·44	·	·51			·	·38			·	·16			·09	·			
180—186	·	·58	·	·61	·	·41			·	·19			·	·17			·	·15			·26
206—200	·16	·	·15	·	·16	·	·16	·			·28	·			·34	·					·22
207—213	·02	·	·08	·10			·	·01			·	·04			·10	·			·11	·	—
234—228	·22 ·23	:	·13	·			·29	·	·50	·			·31	·					·24	·	
235—241	·09	·	·07	·	·16	·			·10	·	·14	·					·13	·			·09
261—255	·	·25	·	·18	·	·28			·	·31	·	·24					·	·07			·05
262—268	:	·21 ·42	·	·36			·	·25	·	·28			·	·22					·	·24	
289—283	·	·10	:	·21 ·22			·	·24			·	·09			·	·10			·	·15	—
290—296	·	·05	·02	·	·07	·	·	·06			·06	·			·02	·					·01
316—311	·02	·	·	·01	·	·03			·	·07			·	·23			·	·27			
317—323	·09 ·22	:	·17	·	·13	·			·04	·			·	·09			·	·39			
344—338	·	·15	·08	·	·16	·	·07	·			·12	·			·10	·			·01	·	—
345—351	·	·15	·20	·	·30	·	·32	·			·24	·			·07	·			·	·23	—
	1·72	4·00	2·10	3·44	2·51	2·20	2·04	1·13	1·15	2·19	2·19	0·88	0·48	1·79	1·84	0·88	0·59	1·69	2·70	1·25	
Total b	−2·28		−1·34		+0·31		+0·91		−1·04		+1·31		−1·31		+0·96		−1·10		+1·45		
$a-b$	+1·31		+2·00		−0·04		−0·11		−0·90		−0·30		+0·55		+1·57		+0·77		+0·96		
$(a-b)\times$Mult.	+1·31		+1·80		+ ·		+ ·		+ ·		+ ·		+0·22		+0·47		+0·15		+0·10		
	− ·		− ·		−0·03		−0·08		−0·54		−0·15		− ·		− ·		− ·		− ·		

$\Sigma(a-b)\times$ Mult. $= +4·05$ $\Sigma(a-b)\times$ Mult. $= -0·80$ $\Sigma dh\cos(\sigma-\varpi)t = \Sigma^{0}_{364}(a-b)\times$ Mult. $= +3·25$

NOTE.—The arrows show the direction of the sequence of the entries of dh in the columns in which points are inserted, the values being entered under their proper signs—*e.g.*, in the first row (marked 0 to 6) with arrow from left to right, the entries for day 0 and for day 1 are to be entered in column 1·0, for day 2 in column ·9, for day 3 in column ·8, and so on. After filling in the first row of the upper half, the first two rows of the lower half are to be filled, and so on alternately, the alternation of entry being indicated by the curved arrows. In the spaces containing double points two successive entries are to be filled in—the first entry above, the second below; *e.g.*, in row 0 to 6, column 1·0, there are double points, and the entry of dh for day 0 is to be made above the line and to left or right according as it is + or −, and for day 1 it is to be made below the line, and to left or right according as it is + or −. The entries in column 0 are made irrespective of sign.

FORMS FOR LONG-PERIOD TIDES.

TIDE Mf.

$\Sigma dh \sin 2\sigma t.$

Multiplier	1·0		·9		·8		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
3 to 0	·32	·			·26	·							·03	·							·03
4 – 6	·49	·					·65	·					·74	·							
17 – 14	·	·02	·	·00					·	·07							·02	·			
18 – 20			·	·21					·	·12							·07	·			
31 – 29	·	·08	·	·04			·	·11							·	·13					
32 – 34					·16	·					·33	·							·42	·	
44 – 41	·	·34			·	·18							·	·20							·43
45 – 47	·	·27					·	·24					·	·42							
58 – 55	·	·39	·	·28					·	·20							·	·29			
59 – 61			·	·38					·	·42							·	·21			
72 – 69	·	·24	·	·22			·	·02							·03	·					
73 – 75					·	·34					·	·53							·	·36	
85 – 82	·10	·			·18	·					·32	·									·55
86 – 88	·07	·					·05	·					·23	·							
99 – 96	·29	·	·20	·					·16	·							·10	·			
100–102			·27	·					·10	·							·	·12			
113–110	·	·00	·15	·			·13	·							·05	·					
114–116					·	·12					·	·29									·32
126–123	·10	·			·	·00					·	·07									·13
127–129	·00	·					·13	·							·09	·					
140–137	·	·07	·07	·					·04	·							·	·03			
141–143			·	·32					·	·36							·	·25			
154–151	·31	·	·13	·			·03	·							·05	·					
155–157					·46	·					·67	·									·92
167–164	·43	·			·26	·					·04	·									·12
168–170			·58	·			·53	·							·50	·					
181–178	·	·61	·	·58					·	·63							·	·54			
182–184			·	·41					·	·19							·	·17			
195–192	·	·03	·	·35			·	·47							·	·59					
196–198					·17	·					·18	·									·28
208–205	·08	·			·02	·					·16	·									·15
209–211			·	·10			·	·01							·	·04					
222–219	·	·07	·24	·					·27	·							·31	·			
223–225			·	·14					·	·07							·18	·			
235–233	·09	·					·23	·							·22	·					
236–239	·07	·			·16	·					·10	·									·14
249–246	·	·30			·	·04					·17	·									·25
250–252			·	·48			·	·47							·	·37					
263–260	·	·42	·	·21					·	·25							·	·18			
264–266			·	·36					·	·25							·	·28			
276–274	·47	·					·18	·					·21	·							
277–280	·47	·			·43	·					·21	·									
290–287	·	·05			·	·10					·	·22									·25
291–293			·02	·			·07	·							·	·06			·	·21	
304–301	·13	·	·16	·					·21	·							·17	·			
305–307			·15	·					·11	·							·	·05			
317–315	·09	·					·02	·					·	·01							
318–321	·22	·			·17	·							·13	·							
331–328	·	·13			·	·20					·	·46									·04
332–334			·04	·			·15	·							·17	·			·	·58	
345–342	·	·15	·	·15					·08	·							·16	·			
346–348			·20	·					·30	·											
358–356	·	·33					·	·52					·	·35					·32	·	
359–362	·	·19			·	·13							·	·17							·16
	3·73	3·69	2·21	4·23	2·27	1·11	2·17	1·84	1·27	2·56	2·18	1·57	1·34	1·15	1·11	1·19	1·01	2·12	0·74	1·15	
Total *a*	+0·04		−2·02		+1·16		+0·33		−1·29		+0·61		+0·19		−0·08		−1·11		−0·41		

10 to 7	·18	·			·25	·					·35	·							·66	·
11—13			·23	·			·22	·							·22	·				
24—21	·35	·	·39	·					·39	·							·26	·		
25—27			·23	·					·09	·									·	·08
37—35	·	·11					·05	·					·30	·						
38—40	·	·19			·	·30							·	·37						
51—48	·	·15			·	·07					·	·15							·	·35
52—54			·	·28			·	·37							·	·46				
65—62	·20	·	·08	·					·	·07							·	·15		
66—68			·34	·					·27	·			·	·28					·06	·
78—76	·02	·							·	·12			·53	·						
79—81	·19	·			·54	·														
92—89	·33	·			·24	·					·19	·							·23	·
93—95			·47	·			·36	·							·23	·				
106—103	·	·05	·	·29					·	·41							·	·34		
107—109			·	·02					·12	·									·	·01
119—117	·	·27			·	·38							·	·28						
120—122	·	·41			·	·35							·	·24						
133—130	·	·45			·	·28					·	·10							·02	·
134—136			·	·53			·	·51							·	·30				
147—144	·	·16	·	·24			·	·29							·	·18				
148—150			·	·09							·	·04							·05	·
160—158	1·34	·			1·93	·							1·78	·						
161—163	·77	·			·34	·							·16	·						
174—171	·	·16	·09	·							·42	·							·49	·
175—177			·	·38			·	·51							·	·44				
188—185	·	·17	·	·14			·	·26							·	·15				
189—191			·	·36							·	·50							·	·58
201—199	·34	·			·22	·							·13	·						
202—204	·28	·			·16	·							·16	·						
215—212	·47	·	·20	·							·11	·							·10	·
216—218			·40	·			·45	·							·56	·				
229—226	·31	·	·24	·			·23	·							·15	·				
230—232					·50	·					·29	·							·13	·
242—240	·18	·			·09	·							·13	·						
243—245	·03	·			·16	·							·19	·						
256—253	·	·07	·	·05					·	·07									·	·28
257—259			·	·24					·	·31							·	·28		
270—267	·	·16	·	·18			·	·24							·	·22				
271—273					·	·16					·	·05							·07	·
283—281	·	·15			·05	·							·16	·						
284—286	·	·10							·	·09			·	·24						
297—294	·05	·	·01	·					·02	·									·06	·
298—300			·	·09					·	·05							·15	·		
311—308	·	·27	·	·19			·	·09							·	·08				
312—314					·	·23					·	·07							·	·03
324—322	·	·58			·	·39							·	·09						
325—327	·	·80					·	·68					·	·64						
338—335	·01	·	·05	·					·05	·									·04	·
339—341			·10	·					·12	·							·07	·		
352—349	·	·19	·	·23			·07	·							·24	·				
353—355					·	·07					·	·19							·	·33
364—363					·	·17							·	·17						
	5·05	4·44	2·83	3·31	4·48	2·40	1·38	2·95	1·06	1·12	1·36	1·10	3·54	2·31	1·40	1·83	0·48	0·77	1·91	1·66
Total b	+0·61		−0·48		+2·08		−1·57		−0·06		+0·26		+1·23		−0·43		−0·29		+0·25	
$a-b$	−0·57		−1·54		−0·92		+1·90		−1·23		+0·35		−1·04		+0·35		−0·82		−0·66	
$(a-b)\times$ Mult.	+ ·		+ ·		+ ·		+1·33		+ ·		+0·18		+ ·		+0·10		+ ·		+ ·	
	−0·57		−1·39		−0·74		− ·		−0·74		− ·		−0·42		− ·		−0·16		−0·07	

$\Sigma(a-b)\times$ Mult. $= +1·61$ $\Sigma(a-b)\times$ Mult. $= -4·09$ $\Sigma dh \sin 2\sigma t = \Sigma^{0}_{364}(a-b)\times$ Mult. $= -2·48$

FORMS FOR LONG-PERIOD TIDES.

TIDE Mf.

$\Sigma dh \cos 2\sigma t.$

Multiplier	1·0		·9		·8		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
0 to 3	·03	·	·03	·					·26	·							·32	·			
14—11	·02	·	·22	·			·22	·							·23	·					
15—17					·	·07					·	·00									·02
27—24	·	·08			·09	·					·23	·									·35
28—30			·	·13			·	·11							·	·04					
41—38	·	·43	·	·37					·	·30							·	·19			
42—44			·	·20					·	·18							·	·34			
54—52	·	·46					·	·37							·	·28					
55—68	·	·29			·	·20					·	·28									·39
68—65	·06	·			·27	·					·34	·									·20
69—71			·03	·			·	·02							·	·22					
82—79	·55	·	·53	·					·54	·							·19	·			
83—85			·32	·					·18	·							·10	·			
95—93	·23	·					·36	·					·47	·							
96—99	·10	·			·16	·					·20	·									·29
109—106	·	·01			·12	·					·	·02							·	·05	
110—112			·05	·			·13	·							·15	·					
123—120	·	·13	·	·24					·	·35							·	·41			
124—126			·	·07					·	·00							·10	·			
136—134	·	·30					·	·51					·	·53							
137—140	·	·03			·04	·							·07	·							·07
150—147	·05	·			·	·04					·	·09							·	·16	
151—153			·05	·			·03	·							·13	·					
164—161	·12	·	·16	·					·34	·							·77	·			
165—167			·04	·					·26	·							·43	·			
177—175	·	·44					·	·51					·	·38							
178—181	·	·54			·	·63							·	·58							·61
191—188	·	·58			·	·50					·	·36							·	·17	
192—194			·	·59			·	·47							·	·35					
205—202	·15	·	·16	·					·16	·							·28	·			
206—208			·16	·					·02	·									·08	·	
218—216	·56	·					·45	·					·40	·							
219—221	·31	·			·27	·							·24	·							
232—229	·13	·			·29	·					·50	·							·31	·	
233—235			·22	·			·23	·							·09	·					
246—243	·25	·	·19	·					·16	·							·03	·			
247—249			·17	·					·	·04									·	·30	
259—257	·	·28			·	·31							·	·24							
260—262	·	·18			·	·25							·	·21							
273—270	·07	·			·	·05					·	·16							·	·16	
274—276			·21	·			·18	·							·47	·					
287—284	·	·21	·	·24			·	·09									·	·10			
288—290			·	·22							·	·10							·	·05	
300—298	·15	·			·	·05							·	·09							
301—303	·17	·			·21	·							·16	·							
314—311	·	·03			·	·07					·	·23							·	·27	
315—317			·	·01			·02	·							·09	·					
328—325	·	·58	·	·64			·	·68							·	·80					
329—331			·	·46							·	·20							·	·13	
341—339	·07	·			·12	·							·10	·							
342—344	·16	·			·08	·							·	·15							
355—352	·	·33	·	·19							·	·07							·	·19	
356—358			·	·35			·	·52							·	·33					
	3·18	4·90	2·54	3·71	1·65	2·17	1·62	3·28	1·92	0·87	1·27	1·51	1·44	2·18	1·16	2·02	2·22	1·04	0·39	1·48	
Total *a*	−1·72		−1·17		−0·52		−1·66		+1·05		−0·24		−0·74		−0·86		+1·18		−1·09		

7 to 4	.66	·	.74	·			.65	·							.49	·					
8—10			.35	·							.25	·							.18	·	
20—18	.07	·			·	.12							·	.21							
21—23	.26	·			.39	·							.39	·							
34—31	.42	·	.33	·							.16	·							·	.08	
35—37			.30	·			.08	·							·	.11					
48—45	·	.35	·	.42			·	.24							·	.27					
49—51					·	.13					·	.07							·	.15	
61—59	·	.21			·	.42							·	.38							
62—64	·	.15			·	.07							.08	·							
75—72	·	.36	·	.53							·	.34							·	.24	
76—78			·	.28			·	.12									.02	·			
89—86	.23	·	.23	·			.05	·							.07	·					
90—92					.19	·					.24	·							.33	·	
102—100	·	.12			.10	·							.27	·							
103—105	·	.34			·	.41							·	.29							
116—113	·	.32	·	.29					·	.12									·	.00	
117—119			·	.28					·	.38							·	.27			
130—127	.02	·	.09	·			.13	·							.00	·					
131—133					·	.10					·	.28							·	.45	
143—141	·	.25			·	.36							·	.32							
144—146	·	.18					·	.29					·	.24							
157—154	.92	·	.67	·					.46	·									.31	·	
158—160			1.78	·					1.93	·							1.34	·			
171—168	.49	·	.50	·			.53	·							.58	·					
172—174					.42	·					.09	·							·	.16	
184—182	·	.17			·	.19							·	.41							
185—187	·	.15					·	.26					·	.14							
198—195	.28	·	.18	·					.17	·							·	.03			
199—201			.13	·					.22	·							.34	·			
212—209	.10	·	·	.04			·	.01							·	.10					
213—215					.11	·					.20	·							.47	·	
225—222	.18	·			·	.07							·	.14							.07
226—228	.15	·					.23	·					.24	·							
239—236	.14	·	.10	·					.16	·							.07	·			
240—242			.13	·					.09	·							.18	·			
253—250	·	.28	·	.37			·	.47							·	.48					
254—256					·	.07					·	.05							·	.07	
266—263	·	.28			·	.25					·	.36									.42
267—269	·	.22					·	.24					·	.18							
280—277	.25	·	.21	·					.43	·							.47	·			
281—283			.16	·					.05	·							·	.15			
294—291	.06	·	·	.06			.07	·							.02	·					
295—297					.02	·					.01	·									.05
307—304	·	.05			.11	·					.15	·									.13
308—310	·	.08					·	.09							·	.19					
321—318	.04	·	.13	·					.17	·							.22	·			
322—324			·	.09					·	.39							·	.58			
335—332	.04	·	.17	·			.15	·							.04	·					
336—338					.05	·					.05	·									.01
348—345	.32	·			.30	·					.20	·									.15
349—351			.24	·			.07	·							·	.23					
362—359	·	.16	·	.17					·	.13							·	.19			
363—364			·	.17					·	.17											
	4.63	3.67	6.44	2.70	1.69	2.21	1.93	1.72	3.68	1.19	1.35	1.10	0.98	2.31	1.20	1.38	2.64	1.22	1.29	1.15	
Total b	+0.96		+3.74		−0.52		+0.21		+2.49		+0.25		−1.33		−0.18		+1.42		+0.14		
$a-b$	−2.68		−4.91		−0.00		−1.87		−1.44		−0.49		+0.59		−0.68		−0.24		−1.23		
$(a-b)\times$ Mult.	+ ·		+ ·		+ ·		+ ·		+ ·		+ ·		+0.24		+ ·		+ ·		+ ·		
	−2.68		−4.42		−0.00		−1.31		−0.86		−0.25		− ·		−0.20		−0.05		−0.12		

$\Sigma (a-b) \times$ Mult. $= +0.24$ $\Sigma (a-b) \times$ Mult. $= -9.89$ $\Sigma dh \cos 2\sigma t = \Sigma^{0}_{364} (a-b) \times$ Mult. $= -9.65$

FORMS FOR LONG-PERIOD TIDES.

Tide MSf.

$\Sigma dh \sin 2(\sigma-\eta)t.$

Multiplier	1·0		·9		·8		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
3 to 0	·32	·					·26	·					·03	·							·03
4— 7	·49	·			·65	·					·74	·					·66	·			—
18— 15	·	·11			·	·02					·	·00							·	·07	
19— 22	·	·12			·07	·					·26	·							·39	·	—
33— 30	·33	·	·16	·					·	·08							·	·04			
34— 36			·42	·			·30	·					·05	·							—
48— 45	·	·35	·	·42			·	·24							·	·27					
49— 51			·	·15					·	·07					·	·15					—
63— 60	·	·07	·	·15			·	·21					·	·42							
64— 66			·08	·			·		·20	·							·34	·			—
77— 74	·	·12			·	·28					·	·36							·	·53	
78— 81	·02	·			·19	·					·54	·							·53	·	—
92— 89	·33	·			·24	·			·19	·							·23	·			
93— 95			·47	·			·36	·					·23	·							—
107—104	·	·02	·	·05					·	·29					·	·41					
108—110			·12	·			·	·01							·05	·					—
122—119	·	·24	·	·35			·	·41					·	·27							
123—125			·	·13					·	·07							·	·00			—
136—133	·	·30			·	·51							·	·53							·45
137—140	·	·03			·04	·					·07	·							·	·07	—
151—148	·05	·			·05	·					·	·04							·	·09	
152—155	·03	·			·13	·							·31	·							·46
166—163	·26	·	·04	·					·12	·							·16	·			
167—169			·43	·			·58	·							·53	·					—
181—178	·	·61	·	·58			·	·63							·	·54					
182—184			·	·41					·	·19							·	·17			—
195—192	·	·03			·	·35							·	·47							·59
196—199	·17	·			·18	·					·28	·							·13	·	—
210—207	·	·01			·	·10					·08	·							·02	·	
211—214	·	·04			·10	·							·11	·							·20
225—222	·18	·	·	·07					·	·14							·	·07			
226—228			·15	·			·23	·					·24	·							—
240—237	·13	·	·14	·			·10	·							·16	·					
241—243			·09	·					·18	·					·03	·					—
254—252	·	·07					·	·28					·	·37							
255—258	·	·05			·	·07			·	·24							·	·31			—
269—266	·	·18			·	·24					·	·22							·	·28	
270—273	·	·16			·	·16					·	·05							·07	·	—
284—281	·	·10	·	·15					·05	·							·16	·			
285—287			·	·09			·	·24					·	·21							—
299—296	·	·05	·	·09			·05	·							·01	·					
300—302			·15	·			·17	·							·21	·					—
314—311	·	·03	·	·07			·	·23					·	·27							
315—317			·	·01				·	·02	·							·09	·			—
328—325	·	·58			·	·64					·	·68							·	·80	
329—332	·	·46			·	·20					·	·13							·04	·	—
343—340	·08	·			·16	·			·07	·							·12	·			
344—346	·	·15					·	·15					·20	·							—
358—355	·	·33	·	·52					·	·35					·	·33					
359—361			·	·19			·	·13							·	·17					—
	2·39	4·31	2·25	3·43	1·81	2·57	2·05	2·53	0·83	1·43	1·97	1·48	1·17	2·54	0·99	1·87	1·76	0·59	1·18	1·84	
Total σ	−1·92		−1·18		−0·76		−0·48		−0·60		+0·49		−1·37		−0·88		+1·17		−0·66		

11 to 8	·23	·	·18	·					·25	·					·35	·					
12— 14			·22	·			·22	·							·02	·					
26— 23	·09	·	·23	·			·35	·							·39	·					
27— 29			·	·08					·	·13							·	·11			
40— 37	·	·37			·	·30							·	·19							·11
41— 44	·	·43			·	·20					·	·18							·	·34	
55— 52	·	·29			·	·46					·	·37							·	·28	
56— 59	·	·20			·	·28							·	·39							·38
70— 67	·	·02	·03	·					·06	·							·27	·			
71— 73			·	·22			·	·24							·	·34					
85— 82	·10	·	·18	·			·32	·							·55	·					
86— 88			·07	·					·05	·							·23	·			
99— 96	·29	·			·20	·							·16	·							·10
100—103	·27	·			·10	·					·	·12							·	·34	
114—111	·	·12			·	·00					·15	·							·13	·	
115—118	·	·29			·	·32					·	·28									
129—126	·09	·	·13	·					·00	·							·10	·			·38
130—132			·02	·			·	·10					·	·28							
144—141	·	·18	·	·25			·	·36							·	·32					
145—147			·	·29					·	·24					·	·16					
159—156	1·93	·	1·78	·			·92	·					·67	·							
160—162			1·34	·					·77	·							·34	·			
173—170	·09	·			·42	·					·49	·							·50	·	
174—177	·	·16			·	·38					·	·51							·	·44	
188—185	·	·17	·	·14					·	·26							·	·15			
189—191			·	·36			·	·50					·	·58							
203—200	·16	·	·28	·					·34	·					·22	·					
204—206			·16	·			·15	·							·16	·					
218—215	·56	·	·45	·			·40	·					·47	·							
219—221			·31	·					·27	·							·24	·			
232—229	·13	·			·29	·					·50	·							·31	·	
233—236	·22	·			·23	·					·09	·							·07	·	
247—244	·17	·			·25	·					·19	·					·16	·			
248—251	·	·04					·	·30					·	·48							·47
262—259	·	·21	·	·25					·	·18					·	·28					
263—265			·	·42			·	·36							·	·25					
277—274	·47	·	·47	·			·18	·							·21	·					
278—280			·43	·					·21	·							·25	·			
291—288	·02	·			·	·05							·	·10							·22
292—295	·07	·			·	·06					·06	·							·02	·	
306—303	·11	·			·15	·					·13	·							·16	·	
307—310	·	·05			·	·08							·	·09							·19
321—318	·04	·	·13	·					·17	·							·22	·			
322—324			·	·09			·	·39							·	·58					
330—333	·05	·	·04	·			·17	·							·15	·					
337—339			·05	·					·01	·					·10	·					
350—347	·07	·					·24	·					·32	·							·30
351—354	·	·23			·	·19					·	·07					·	·19			
364—362					·	·17					·	·17							·	·16	
	5·16	2·76	6·50	2·10	1·64	2·49	2·95	2·25	2·13	0·81	1·61	1·70	1·62	2·11	2·15	1·93	1·81	0·45	1·19	1·56	
Total b	+2·40		+4·40		−0·85		+0·70		+1·32		−0·09		−0·49		+0·22		+1·36		−0·37		
$a-b$	−4·32		−5·58		+0·09		−1·18		−1·92		+0·58		−0·88		−1·10		−0·19		−0·29		
$(a-b)\times$ Mult.	+ ·		+ ·		+0·07		+ ·		+ ·		+0·29		+ ·		+ ·		+ ·		+ ·		
	−4·32		−5·02		− ·		−0·83		−1·15		− ·		−0·35		−0·33		−0·04		−0·03		

$\Sigma(a-b) \times$ Mult. $= +0·36$ $\Sigma(a-b) \times$ Mult. $= -12·07$ $\Sigma dh \sin 2(\sigma-\eta) t = \Sigma^0_{364} (a-b) \times$ Mult. $= -11·71$

FORMS FOR LONG-PERIOD TIDES.

TIDE MSf.

$\Sigma dh \cos 2(\sigma - \eta)t.$

Multiplier	1·0		·9		·8		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
0 to 3	·03	·	·03	·			·26	·							·32	·					—
15— 12	·	·07	·02	·			·22	·					·22	·							
16— 18			·	·00					·	·02							·	·21			—
29— 26	·	·11			·	·13					·	·08							·09	·	
30— 33	·	·04			·	·08					·16	·							·33	·	—
44— 41	·	·34			·	·18			·	·20							·	·43			
45— 47	·	·27					·	·24					·	·42							—
59— 56	·	·38	·	·39					·	·28					·	·20					
60— 62			·	·42			·	·21							·	·15					—
74— 71	·	·53	·	·34			·	·24					·	·22							
75— 77			·	·36					·	·28							·	·12			·10
88— 85	·23	·			·05	·							·07	·							
89— 92	·23	·			·19	·					·24	·							·33	·	—
103—100	·	·34			·	·12					·10	·							·27	·	
104—107	·	·41			·	·29							·	·05							·02
118—115	·	·38	·	·28					·	·32							·	·29			
119—121			·	·27			·	·41							·	·35					—
133—130	·	·45	·	·28			·	·10							·02	·					
134—136			·	·53					·	·51							·	·30			
147—144	·	·16			·	·24							·	·29							·18
148—151	·	·09			·	·04					·05	·							·05	·	—
162—159	·34	·			·77	·					1·34	·							1·93	·	
163—166	·16	·			·12	·					·04	·									·26
177—174	·	·44	·	·51					·	·38							·	·16			
178—180			·	·54			·	·63					·	·58							—
192—189	·	·59	·	·58			·	·50							·	·36					
193—195			·	·47					·	·35					·	·03					—
207—204	·02	·	·16	·			·15	·					·16	·							—
208—210			·08	·					·	·10							·	·01			—
221—218	·24	·			·27	·					·31	·							·56	·	
222—225	·	·07			·	·14					·	·07							·18	·	—
236—233	·07	·	·09	·					·23	·							·22	·			
237—239			·16	·			·10	·					·14	·							—
251—248	·	·47	·	·48					·	·30					·	·04					
252—254			·	·37			·	·28							·	·07					—
266—263	·	·28	·	·25			·	·36					·	·42							
267—269			·	·22					·	·24							·	·18			—
280—277	·25	·			·21	·					·43	·							·47	·	
281—284	·16	·			·05	·					·	·15							·	·10	—
295—292	·02	·			·06	·					·	·06					·07	·			
296—299	·01	·					·05	·					·	·09							·05
310—307	·	·19	·	·09					·	·08					·	·05					
311—313			·	·27			·	·23							·	·07					—
325—322	·	·80	·	·58			·	·39					·	·09							
326—328			·	·68					·	·64							·	·58			·05
339—336	·10	·			·01	·							·05	·							
340—343	·12	·			·07	·					·16	·							·08	·	—
354—351	·	·19			·	·07					·	·19							·	·23	
355—358	·	·33			·	·35							·	·52							·33
	1·98	6·93	0·54	7·91	1·80	1·64	0·78	3·59	0·23	3·70	2·83	0·55	0·64	2·68	0·34	1·32	0·29	2·28	4·29	0·33	
Total a	−4·95		−7·37		+0·16		−2·81		−3·47		+2·28		−2·04		−0·98		−1·99		+3·96		

7 to 4	·66	·			·74	·					·65	·							·49	·	·23
8—11	·35	·			·25	·							·18	·							
22—19	·39	·	·26	·					·07	·							·	·12			
23—25			·39	·			·35	·							·23	·					
37—34	·	·11	·05	·			·30	·							·42	·					
38—40			·	·19					·	·30					·	·37					
51—48	·	·15			·	·07							·	·15							·35
52—55	·	·28			·	·37					·	·46					·	·29			
66—63	·34	·			·20	·					·08	·							·	·07	
67—70	·27	·			·06	·					·03	·							·	·02	
81—78	·53	·	·54	·					·19	·							·02	·			
82—84			·55	·			·32	·					·18	·							
96—93	·10	·	·23	·			·36	·							·47	·					
97—99			·16	·					·20	·					·29	·					
111—108	·13	·	·05	·			·	·01					·12	·							
112—114			·15	·					·	·00							·	·12			
125—122	·	·00			·	·07					·	·13							·	·24	
126—129	·10	·			·00	·					·13	·							·09	·	
140—137	·	·07	·07	·					·04	·							·	·03			
141—143			·	·32			·	·36					·	·25							
155—152	·46	·	·31	·					·13	·					·03	·					
156—158			·67	·			·92	·							1·78	·					
170—167	·50	·	·53	·			·58	·					·43	·							
171—173			·49	·					·42	·							·09	·			
184—181	·	·17			·	·19					·	·41									·61
185—188	·	·15			·	·26					·	·14							·	·17	
199—196	·13	·			·28	·					·18	·							·17	·	
200—203	·22	·			·34	·							·28	·							·16
214—211	·20	·	·11	·					·10	·							·	·04			
215—217			·47	·			·40	·							·45	·					
229—226	·31	·	·24	·			·23	·							·15	·					
230—232			·50	·					·29	·							·13	·			
243—240	·03	·			·18	·							·09	·							·13
244—247	·16	·			·19	·					·25	·							·17	·	
258—255	·	·31			·	·24					·	·07							·	·05	
259—262	·	·28			·	·18							·	·25							·21
273—270	·07	·	·	·05					·	·16							·	·16			
274—276			·21	·			·18	·					·47	·							
288—285	·	·22	·	·21			·	·24							·	·09					
289—291			·	·10					·	·05					·02	·					
302—300	·21	·					·17	·					·15	·							
303—306	·16	·			·13	·					·15	·					·11	·			
317—314	·09	·			·02	·					·	·01							·	·03	
318—321	·22	·			·17	·					·13	·							·04	·	
332—329	·04	·	·	·13					·	·20							·	·46			
333—335			·15	·			·17	·					·04	·							
347—344	·30	·	·20	·			·	·15							·	·15					
348—350			·32	·					·24	·					·07	·					
362—359	·	·16	·	·17			·	·13					·	·19							
363—364			·	·17					·	·17											
	5·97	1·90	6·65	1·34	2·56	1·38	3·98	0·89	1·68	0·88	1·60	1·22	1·94	0·84	3·91	0·61	0·35	1·22	0·96	·0·58	
Total *b*	+4·07		+ 5·31		+1·18		+3·09		+0·80		+0·38		+1·10		+3·30		−0·87		+0·38		
a−*b*	−9·02		−12·68		−1·02		−5·90		−4·27		+1·90		−3·14		−4·28		−1·12		+3·58		
$(a-b)\times$ Mult.	+ ·		+ ·		+ ·		+ ·		+ ·		+0·95		+ ·		+ ·		+ ·		+0·36		
	−9·02		−11·41		−0·82		−4·13		−2·56		− ·		−1·26		−1·28		−0·22		− ·		

$\Sigma(a-b)\times$ Mult. $= +1{\cdot}31$ $\Sigma(a-b)\times$ Mult. $= -30{\cdot}70$ $\Sigma dh\cos 2(\sigma-\eta)t = \Sigma^{0}_{364}(a-b)\times$ Mult. $= -29{\cdot}39$

FORMS FOR LONG-PERIOD TIDES.

TIDE Sa.

$\Sigma dh \sin \eta t$.

Multiplier	1·0		1·0		1·0		·9		·9		·8		·8		·7		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
91 to 0	·07 ·05 ·23 ·23 ·19 ·24	· · · · · ·	·54 ·53 ·55 ·32 ·18 ·10	· · · · · ·	· · · · · ·02 ·19	·34 ·53 ·36 ·28 ·12 · ·	·27 ·06 ·03 · · ·	· · · ·02 ·22 ·24	· · · · ·08 ·20 ·34	·42 ·21 ·15 ·07 · · ·	· · · · ·	·29 ·20 ·28 ·39 ·38	· · · · ·	·07 ·15 ·28 ·37 ·46	· · · ·	·24 ·42 ·35 ·15	· · · ·	·20 ·18 ·34 ·27	·30 ·05 · · · · ·	· · ·11 ·19 ·30 ·37 ·43	· · · · ·16 ·33 ·42	·13 ·11 ·04 ·08 · · ·	·26 ·39 ·39 ·35 ·23 ·09 ·	· · · · · · .08	· · · · · ·07	·07 ·00 ·02 ·21 ·12 ·	·18 ·23 ·22 ·22 ·02	· · · · ·	·49 ·65 ·74 ·66 ·35 ·25	· · · · · ·	·03 ·03 ·26 ·32
92 to 182	·33 ·47 ·36 ·23 ·10 ·16	· · · · · ·	·20 ·29 ·27 ·10 · ·	· · · · ·12 ·34	· · · · ·12 ·	·41 ·29 ·05 ·02 · ·01	·05 ·13 ·15 · · · ·	· · · ·00 ·12 ·29 ·32	· · · · · · ·	·28 ·38 ·27 ·41 ·35 ·24 ·13	· · ·10 ·00 ·13	·07 ·00 · · ·	·09 ·02 · ·	· · ·10 ·28	· · · · ·	·45 ·53 ·51 ·30 ·03	·04 ·07 · ·	· · ·07 ·32	· · · · · · ·	·36 ·25 ·18 ·29 ·24 ·16 ·09	· ·05 ·05 ·03 ·13 ·31 ·46	·04 · · · · · ·	·67 ·92 1·78 1·93 1·34 ·77	· · · · · ·	·34 ·16 ·12 ·04 ·26 ·43	· · · · · ·	·58 ·53 ·50 ·49 ·42 ·09	· · · · · ·	· · · · · ·	·16 ·38 ·51 ·44 ·54 ·63	·58 ·61 ·41
	2·66	0·00	3·08	0·46	0·33	2·41	0·69	1·21	0·62	2·91	0·23	1·61	0·11	1·71	0·00	2·98	0·11	1·38	0·35	2·97	1·94	0·40	9·12	0·08	1·42	0·42	3·48	0·00	3·14	2·66	
Total a	+ 2·66		+ 2·62		− 2·08		− 0·52		− 2·29		− 1·38		− 1·60		− 2·98		− 1·27		− 2·62		+ 1·54		+ 9·04		+ 1·00		+ 3·48		+ 0·48		
273 to 183	· · · · · ·07	·24 ·18 ·16 ·16 ·05 ·	· · · · · ·	·21 ·42 ·36 ·25 ·28 ·22	· · · · · ·	·07 ·24 ·31 ·28 ·18 ·25	· · · · · ·	·48 ·47 ·37 ·28 ·07 ·05	·03 ·16 ·19 ·25 ·17 · ·	· · · · · ·04 ·30	·10 ·14 ·13 ·09 ·18	· · · · ·	·22 ·23 ·09 ·07 ·16	· · · · ·	·31 ·50 ·29 ·13	· · · ·	·18 ·15 ·23 ·24	· · · ·	·45 ·56 ·31 ·27 ·24 · · ·	· · · · · ·07 ·14 ·07	· · ·10 ·11 ·20 ·47 ·40	·01 ·04 · · · · ·	·16 ·15 ·16 ·02 ·08 ·	· · · · · ·10	·28 ·13 ·22 ·34 ·28 ·16	· · · · · ·	· · · · ·17 ·18	·59 ·47 ·35 ·03 · ·	· · · · · ·	·26 ·14 ·17 ·36 ·50 ·58	·19 ·17 ·15
274 to 364	·21 ·18 ·47 ·47 ·43 ·21 ·25	· · · · · · ·	·16 ·05 · · · ·	· · ·15 ·10 ·09 ·24	· · · · ·02 ·07	·21 ·22 ·10 ·05 · ·	· ·06 ·02 ·01 ·05 · ·	·06 · · · · ·09 ·05	·15 ·17 ·21 ·16 ·13 ·15	· · · · · ·	·11 · · · ·	· ·05 ·08 ·09 ·19	· · · · ·	·27 ·23 ·07 ·03 ·01	·02 ·09 ·22 ·17	· · · ·	·13 ·04 · ·	· · ·09 ·39	· · · · · · ·	·58 ·80 ·68 ·64 ·58 ·46 ·20	· ·04 ·15 ·17 ·04 ·05 ·05	·13 · · · · · ·	·01 ·10 ·12 ·07 ·16 ·08 ·	· · · · · · ·15	· ·20 ·30 ·32 ·24 ·07	·15 · · · · ·	· · · · · ·	·23 ·19 ·07 ·19 ·33 ·35	· · · · ·	·52 ·33 ·19 ·13 ·17	·16 ·17 ·17
	2·29	0·79	0·21	2·32	0·09	1·91	0·14	1·92	1·77	0·34	0·75	0·41	0·77	0·61	1·73	0·00	0·97	0·48	1·83	4·22	1·78	0·18	1·11	0·25	2·54	0·15	0·35	2·80	0·00	3·35	
Total b	+ 1·50		− 2·11		− 1·82		− 1·78		+ 1·43		+ 0·34		+ 0·16		+ 1·73		+ 0·49		− 2·39		+ 1·60		+ 0·86		+ 2·39		− 2·45		− 3·35		
$a-b$	+ 1·16		+ 4·73		− 0·26		+ 1·26		− 3·72		− 1·72		− 1·76		− 4·71		− 1·76		− 0·23		− 0·06		+ 8·18		− 1·39		+ 5·93		+ 3·83		
$(a-b)\times$ Mult. +	+ 1·16		+ 4·73		+ ·		+ 1·13		+ ·		+ ·		+ ·		+ ·		+ ·		+ ·		+ ·		+ 3·27		+ ·		+ 1·19		+ 0·38		
$(a-b)\times$ Mult. −	− ·		− ·		− 0·26		− ·		− 3·35		− 1·38		− 1·41		− 3·30		− 1·23		− 0·14		− 0·03		− ·		− 0·42		− ·		− ·		

$\Sigma(a-b) \times$ Mult. $= +\ 11·86$ $\Sigma(a-b) \times$ Mult. $= -\ 11·52$ $\Sigma dh \sin \eta t = \Sigma^{0}_{364}\ (a-b) \times$ Mult. $= +\ 0·34$

NOTE.—To fill up this form:—Enter days 0, 1, 2, 3 in the last column 0; days 4 to 9 (inclusive) under their proper signs in last column but one ·1; days 10 to 14 (inclusive) in column ·2; days 15 to 20 (inclusive) in column ·3; and so on. Thus in working from right to left (91 to 0), or left to right (92 to 182), fill up each short column before going on to the next, and a similar instruction applies to the filling up of all the rest of the form.

FORMS FOR LONG-PERIOD TIDES.

TIDE Sa.

$\Sigma dh \cos \eta t$.

Multiplier	1·0		1·0		1·0		·9		·9		·8		·8		·7		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
0 to 91	·03	.	·66	.	·22	.	.	·12	·09	.	·16	.	.	·11	.	·20	.	·24	.	·07	.	·39	·08	.	.	·22	.	·12	·32	.	·23
	·03	.	·35	.	·02	.	·07	.	.	·08	·33	.	.	·19	.	·18	.	·42	.	·15	.	·38	·20	.	.	·24	·02	.	·18	.	·19
	·26	.	·25	.	.	·07	·26	.	.	·13	·42	.	.	·30	.	·34	.	·35	.	·28	.	·42	·34	.	.	·34	·19	.	·10	.	·24
	·32	.	·18	.	.	·00	·39	.	.	·11	·30	.	.	·37	.	·27	.	·15	.	·37	.	·21	·27	.	.	·53	·54	.	·07	.	
	·49	.	·23	.	.	·02	·39	.	.	·04	·05	.	.	·43					.	·46	.	·15	·06	.	.	·36	·53	.	·05	.	
	·65	.	·22	.	.	·21	·35	.	.	·08									.	·29	.	·07	·03	.	.	·28	·55	.	·23	.	
	·74	.					·23	.											.	·20			.	·02							
																			.	·28											
364 to 274	.	·19	.	·07	·30	.	·07	.	·17	.	.	·46	.	·58	·13	.	·02	.	.	·09	·21	.	·02	.	.	·10	.	·15	·43	.	·21
	.	·13	.	·19	·32	.	·16	.	·04	.	.	·20	.	·80	·04	.	·09	.	.	·19	·16	.	·01	.	.	·05	.	·10	·21	.	·18
	.	·17	.	·33	·24	.	·08	.	·05	.	.	·13	.	·68	.	·09	·22	.	.	·27	·13	.	·05	.	·02	.	.	·09	·25	.	·47
	.	·16	.	·35	·07	.	.	·15	·05	.	·04	.	.	·64	.	·39	·17	.	.	·23	·15	.	.	·09	·07	.	.	·24	·16	.	·47
	.	·17	.	·52	.	·23	.	·15	·01	.	·15	.	.	·58					.	·07	·11	.	.	·05	.	·06	.	·21	·05	.	
	.	·17	.	·33	.	·19	·20	.	·10	.									.	·03	.	·05	·15	.	·06	.	.	·22			
									·12	.									.	·01	.	·08	·17	.							
	2·52	0·99	1·89	1·79	1·17	0·72	2·20	0·42	0·63	0·44	1·45	0·79	0·00	4·68	0·17	1·47	0·50	1·16	0·00	2·99	0·76	1·75	1·38	0·16	0·15	2·18	1·83	1·13	2·05	0·00	
Total *a*	+ 1·53		+ 0·10		+ 0·45		+ 1·78		+ 0·19		+ 0·66		− 4·68		− 1·30		− 0·66		− 2·99		− 0·99		+ 1·22		− 2·03		+ 0·70		+ 2·05		
182 to 92	.	·44	·49	.	·04	.	1·78	.	·05	.	.	·16	.	·36	·04	.	.	·45	·10	.	.	·27	.	·00	.	·02	·10	.	·23	.	·33
	.	·54	·42	.	·26	.	1·93	.	·03	.	.	·09	.	·25	·07	.	.	·53	·00	.	.	·41	.	·12	·12	.	.	·12	·10	.	·47
	.	·63	·09	.	·43	.	1·34	.	·13	.	.	·04	.	·18	.	·07	.	·51	·13	.	.	·35	.	·29	.	·01	.	·34	·16	.	·36
	.	·58	.	·16	·58	.	·77	.	·31	.	·05	.	.	·29	.	·32	.	·30	·09	.	.	·24	.	·32	·05	.	.	·41	·20	.	
	.	·61	.	·38	·53	.	·34	.	·46	.			.	·24			.	·03	·02	.	.	·13	.	·28	·13	.	.	·29	·29	.	
	.	·41	.	·51	·50	.	·16	.	·67	.									.	·10	.	·07	.	·38	·15	.	.	·05	·27	.	
							·12	.	·92	.									.	·28	.	·00									
183 to 273	.	·19	.	·36	.	·03	·34	.	·08	.	·47	.	·27	.	·18	.	·31	.	·22	.	·13	.	·17	.	.	·28	.	·28	.	·25	·16
	.	·17	.	·50	·17	.	·28	.	.	·10	·40	.	·24	.	·15	.	·50	.	·23	.	·09	.	.	·04	.	·07	.	·18	.	·28	·05
	.	·15	.	·58	·18	.	·16	.	.	·01	·45	.	.	·07	·23	.	·29	.	·09	.	·18	.	.	·30	.	·05	.	·25	.	·22	·07
	.	·26	.	·59	·28	.	·16	.	.	·04	·56	.	.	·14	·24	.	·13	.	·07	.	·03	.	.	·48	.	·07	.	·21	.	·24	
	.	·14	.	·47	·13	.	·15	.	·10	.	·31	.	.	·07					·16	.	·16	.	.	·47	.	·24	.	·42	.	·18	
	.	·17	.	·35	·22	.	·16	.	·11	.									·10	.	·19	.	.	·37	.	·31	.	·36	.	·16	
							·02	.	·20	.									·14	.	·25	.									
	0·00	4·29	1·00	3·90	3·32	0·03	7·71	0·00	3·06	0·15	2·24	0·29	0·51	1·60	0·91	0·39	1·23	1·82	1·35	0·38	1·03	1·47	0·17	3·05	0·45	1·05	0·10	2·91	1·25	1·33	
Total *b*	− 4·29		− 2·90		+ 3·29		+ 7·71		+ 2·91		+ 1·95		− 1·09		+ 0·52		− 0·59		+ 0·97		− 0·44		− 2·88		− 0·60		− 2·81		− 0·08		
a − *b*	+ 5·82		+ 3·00		− 2·84		− 5·93		− 2·72		− 1·29		− 3·59		− 1·82		− 0·07		− 3·96		− 0·55		+ 4·10		− 1·43		+ 3·51		+ 2·13		
(*a* − *b*) × Mult.	+ 5·82		+ 3·00		+ .		+ .		+ .		+ .		+ .		+ .		+ .		+ .		+ .		+ 1·64		+ .		+ 0·70		+ 0·21		
	− .		− .		− 2·84		− 5·34		− 2·45		− 1·03		− 2·87		− 1·27		− 0·05		− 2·38		− 0·28		− .		− 0·43		− .		− .		

$\Sigma(a-b) \times \text{Mult.} = +11·37$ $\Sigma(a-b) \times \text{Mult.} = -18·94$ $\Sigma dh \cos \eta t = \Sigma_{364}^{0}(a-b) \times \text{Mult.} = -7·57$

NOTE.—To fill up this form:—Enter days 0 to 6 (inclusive) under their proper signs in first column 1·0; days 7 to 12 (inclusive) in second column 1·0; days 13 to 18 (inclusive) in third column 1·0; days 19 to 25 (inclusive) in first column ·9; and so on. Thus in working from left to right (0 to 91), or right to left (364 to 274), fill up each short column before going on to the next, and a similar instruction applies to the filling up of all the rest of the form.

FORMS FOR LONG-PERIOD TIDES.

TIDE Ssa.

$\Sigma dh \sin 2\eta t$.

Multiplier	1·0		1·0		1·0		·9		·9		·8		·8		·7		·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
45 to 0		·27		·43		·11	·42			·04		·11	·23				·26			·21	·02		·23		·35		·65		·26		·03
				·20		·19	·30			·08			·09				·39			·12		·07	·22		·25		·74		·32		·03
				·18		·30	·05		·16					·08			·39		·07			·00	·22		·18		·66		·49		
				·34		·37			·33					·13			·35					·02									
46 to 91		·24		·07		·46		·29		·38		·15	·34		·27					·22		·36	·02		·53		·18		·05		·19
		·42		·15				·20		·42		·07			·06					·24		·28	·19		·55		·10		·23		·24
		·35		·28				·28		·21	·08				·03					·34		·12	·54		·32		·07		·23		
		·15		·37				·39			·20					·02				·53											
228 to 183	·24			·07	·27		·45		·11		·10		·08				·16		·22		·18			·35		·58		·17		·15	·19
			·18		·24		·56		·20					·10			·15		·34		·28			·03		·59		·36		·26	·17
			·15			·07	·31		·47					·01			·16		·28		·13		·17			·47		·50		·14	
			·23			·14			·40					·04			·02		·16												
229 to 273	·31		·22				·16		·09		·19					·30		·28		·07		·24		·25		·36		·22		·16	·07
	·50		·23				·10		·18		·25					·48				·05		·31		·21		·25		·24		·16	
	·29		·09				·14		·03		·17					·47				·07		·28		·42		·28		·18		·05	
	·13		·07				·13		·16			·04				·37						·18									
	1·47	1·43	1·17	2·09	0·51	1·64	2·62	1·16	2·13	1·13	0·99	0·37	0·74	0·36	0·36	1·64	1·88	0·28	1·07	1·85	0·61	1·86	1·59	1·26	2·18	2·53	2·40	1·67	1·58	0·92	
Total a	+ 0·04		− 0·92		− 1·13		+ 1·46		+ 1·00		+ 0·62		+ 0·38		− 1·28		+ 1·60		− 0·78		− 1·25		+ 0·33		− 0·35		+ 0·73		+ 0·66		
137 to 92		·03		·45	·09		·10			·24		·35		·28				·00		·01		·29		·12	·29		·10		·47		·33
				·53	·03		·00			·13				·38				·12	·05			·05		·34	·27		·16		·36		
				·51		·10	·13			·07				·27				·29	·13			·02		·41	·10		·20		·23		
				·30		·28				·00				·41				·32	·15		·12										
138 to 182	·04			·36				·24	·05		·13		·92		1·78				·34		·26		·53		·09			·51		·63	·61
	·07			·25				·16	·05		·31				1·93				·16		·43		·50			·16		·44		·58	·41
		·07		·18				·09	·03		·46				1·34				·12		·58		·49			·38		·54			
		·32		·29				·04			·67				·77				·04				·42								
319 to 274	·17			·01		·27		·08	·13		·16			·05			·02		·02			·22		·09	·05		·21		·47		·21
			·02			·23		·09	·15				·15				·01		·07			·10		·24		·15	·25		·47		·18
			·09			·07		·19	·11				·17				·05			·06		·05		·21		·10	·16		·43		
			·22			·03				·05			·21					·09	·06												
320 to 364	·13			·58		·58		·46	·15		·05		·12		·07					·15	·24			·19		·33		·33		·17	·17
	·04			·80				·20	·17		·05				·16				·20		·07			·07		·35		·19		·16	
		·09		·68				·13	·04		·01				·08				·30			·23		·19		·52		·13		·17	
		·39		·64			·04				·10					·15			·32												—
	0·45	0·90	0·33	5·58	0·11	1·56	0·27	1·68	0·88	0·49	1·94	0·35	1·57	1·39	6·13	0·15	0·08	0·82	1·96	0·22	1·70	0·96	1·94	1·86	0·80	1·99	1·08	2·12	2·43	1·71	
Total b	−0·45		− 5·25		− 1·45		− 1·41		+ 0·39		+ 1·59		+ 0·18		+ 5·98		− 0·74		+ 1·74		+ 0·74		+ 0·08		− 1·19		− 1·06		+ 0·72		
$a-b$	+0·49		+ 4·33		+ 0·32		+ 2·87		+ 0·61		− 0·97		+ 0·20		− 7·26		+ 2·34		− 2·52		− 1·99		+ 0·25		+ 0·84		+ 1·79		− 0·06		
$a-b$ × Mult.	+0·49		+ 4·33		+ 0·32		+ 2·58		+ 0·55		+ ·		+ 0·16		+ ·		+ 1·64		+ ·		+ ·		+ 0·10		+ 0·25		+ 0·36		+ ·		
	− ·		− ·		− ·		− ·		− ·		− 0·78		− ·		− 5·08		− ·		− 1·51		− 1·00		− ·		− ·		− ·		− 0·01		

$\Sigma(a-b)$ × Mult. = + 10·78 $\Sigma(a-b)$ × Mult. = − 8·38 $\Sigma dh \sin 2\eta t = \Sigma^{0}_{364}\ (a-b)$ × Mult. = + 2·40

NOTE.—To fill up this form:—Enter days 0 and 1 in the last column 0; days 2, 3, 4 under their proper signs in last column but one ·1; days 5, 6, 7 in column ·2; days 8, 9, 10 in column ·3; and so on. Thus in working from right to left (45 to 0), or left to right (46 to 91), fill up each short column before going on to the next, and a similar instruction applies to the filling up of all the rest of the form.

FORMS FOR LONG-PERIOD TIDES.

TIDE Ssa. $\Sigma dh \cos 2\eta t$.

Multiplier	1·0		1·0		1·0		·9		·9		·8		·8		·7	
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−
0 to 45	·03		·49		·35		·25		·22			·00	·07		·26	
	·03		·65				·18		·02			·02			·39	
	·26		·74				·23			·07		·21			·39	
	·32		·66				·22					·12			·35	
182 to 137		·41		·54		·16	·49		·43		·26		·34		1·78	
				·63		·38	·42		·58				·16		1·93	
				·58		·51	·09		·53				·12		1·34	
				·61		·44			·50				·04		·77	
183 to 228		·19		·14		·58		·59	·17		·13		·16			
		·17		·17				·47	·18		·22					
		·15		·36				·35	·28		·34					
		·26		·50				·03			·28					
364 to 320		·17		·52				·19	·07		·24			·15		
		·16		·33				·33		·23			·20			
		·17		·19				·35		·19			·30			
		·17		·13						·07			·32			
	0·64	1·85	2·54	4·70	0·35	2·07	1·88	2·31	2·98	0·56	1·47	0·35	1·71	0·15	7·21	·
Total *a*	− 1·21		− 2·16		− 1·72		− 0·43		+ 2·42		+ 1·12		+ 1·56		+ 7·21	
91 to 46	·24		·05		·32		·54			·28		·36		·22		
			·23		·18		·53			·12				·24		
			·23		·10		·55		·02					·34		
			·19		·07				·19					·53		
92 to 136	·33		·10		·27		·10			·29	·12		·15			·00
	·47		·16					·12		·05		·01				·12
	·36		·20					·34		·02	·05					·29
	·23		·29					·41			·13					·32
273 to 229				·16		·28		·42		·28		·24		·28		
				·16		·22		·36		·18		·31		·07		
				·05		·24		·25		·25				·05		
			·07			·18				·21				·07		
274 to 319	·21		·43		·05			·15		·21		·05	·06		·02	
	·18		·21					·10		·22	·02				·01	
	·47		·25					·09		·10	·07				·05	
	·47		·16					·24				·06				·09
	2·96	·	2·57	0·37	0·99	0·92	1·72	2·48	0·21	2·21	0·39	1·03	0·21	1·80	0·08	0·82
Total *b*	+ 2·96		+ 2·20		+ 0·07		− 0·76		− 2·00		− 0·64		− 1·59		− 0·74	
a − *b*	− 4·17		− 4·36		− 1·79		+ 0·33		+ 4·42		+ 1·76		+ 3·15		+ 7·95	
(*a* − *b*) × Mult. +	+ ·		+ ·		+ ·		+ 0·30		+ 3·98		+ 1·41		+ 2·52		+ 5·57	
(*a* − *b*) × Mult. −	− 4·17		− 4·36		− 1·79		− ·		− ·		− ·		− ·		− ·	

Multiplier	·7		·6		·5		·4		·3		·2		·1		0
No. of the day	+	−	+	−	+	−	+	−	+	−	+	−	+	−	
0 to 45			·23			·11	·16		·05			·30		·20	·27
			·09			·04	·33			·11		·37		·18	
				·08		·08	·42			·19		·43		·34	
				·13			·30								
182 to 137			·46		·05			·09		·29		·36	·07		·03
			·67		·03			·04		·24		·25		·07	·04
			·92		·13		·05			·16		·18		·32	
					·31										
183 to 228	·16		·08		·10		·47		·56		·24			·07	·23
	·15			·10	·11		·40		·31			·07	·18		·24
	·16			·01	·20		·45		·27			·14	·15		
	·02			·04											
364 to 320	·07		·05		·17			·13		·64		·80		·09	·13
	·16		·01		·04		·04			·58		·68		·39	·04
	·08		·10		·05		·15			·46				·58	
		·15	·12							·20					
	0·80	0·15	2·73	0·36	1·19	0·23	2·77	0·26	1·19	2·87	0·24	3·58	0·40	2·24	
Total *a*	+ 0·65		+ 2·37		+ 0·96		+ 2·51		− 1·68		− 3·34		− 1·84		
91 to 46	·27			·07		·42		·28		·46		·15		·35	·24
	·06		·08			·21		·30		·29		·28		·15	·42
	·03		·20			·15		·38		·20		·37		·07	
		·02	·34												
92 to 136				·28		·41		·07	·00		·02			·45	·30
				·38		·35		·00	·13			·10		·53	
				·27		·2	·10		·09			·28		·51	
						·13									
273 to 229		·30	·25		·18		·14		·07		·22		·50		·31
		·48	·17		·03		·13		·16		·23		·29		
		·47		·04	·16		·09		·10		·09		·13		
		·37			·19										
274 to 319				·05	·16		·11			·09		·07		·01	·22
			·15		·13			·05		·19		·03	·02		·17
			·17		·15			·08		·27			·09		
			·21							·23					
	0·36	1·64	1·57	1·09	1·00	1·91	0·57	1·25	0·55	1·73	0·56	1·28	1·03	2·07	
Total *b*	− 1·28		+ 0·48		− 0·91		− 0·68		− 1·18		− 0·72		− 1·04		
a − *b*	+ 1·93		+ 1·89		+ 1·87		+ 3·19		− 0·50		− 2·62		− 0·80		
(*a* − *b*) × Mult. +	+ 1·35		+ 1·13		+ 0·93		+ 1·28		+ ·		+ ·		+ ·		
(*a* − *b*) × Mult. −	− ·		− ·		− ·		− ·		− 0·15		− 0·52		− 0·08		

$\Sigma(a-b) \times \text{Mult.} = +18{\cdot}47$ $\qquad$ $\Sigma(a-b) \times \text{Mult.} = -11{\cdot}07$ $\qquad$ $\Sigma dh \cos 2\eta t = \Sigma_{364}^{0}\,(a-b) \times \text{Mult.} = +7{\cdot}40$

NOTE.—To fill up this form:—Enter days 0, 1, 2, 3 under their proper signs in the first column 1·0; days 4, 5, 6, 7 in second column 1·0; day 8 in third column 1·0; days 9, 10, 11, 12 in first column ·9; days 13, 14, 15 in second column ·9; and so on. Thus in working from left to right (0 to 45), or right to left (182 to 137), fill up each short column before going on to the next, and a similar instruction applies to the filling up of all the rest of the form.

FORMS FOR LONG-PERIOD TIDES.

SUMMATIONS AND EVALUATION OF LONG-PERIOD TIDES.

Clearance from Effects of Tides of Short Period.

Note.—A *and* **B** *to be extracted from Harmonic Analysis for Tides of Short Period.*

	Tide Mm or $(\sigma - \varpi)$. Cosine Series.	Products.	Tide Mf or 2σ. Cosine Series.	Products.	Tide MSf or $2(\sigma - \eta)$. Cosine Series.	Products.	Tide Sa or η. Cosine Series.	Products.	Tide Ssa or 2η. Cosine Series.	Products.
M_2	A_2 = + 3·579		A_2 = − ·		A_2 = − ·		A_2 = − ·		A_2 = − ·	
	multiplier = − 0·0556	= − ·20	mult. = + 0·0030	= + ·01	mult. = + 5·7393	= + 20·54	mult. = − 0·1041	= − ·37	mult. = − 0·1047	= − ·37
	B_2 = − 2·156		B_2 = − ·		B_2 = − ·		B_2 = − ·		B_2 = − ·	
	multiplier = − 0·1704	= + ·37	mult. = − 0·0377	= + ·08	mult. = − 2·9228	= + 6·30	mult. = − 0·0753	= + ·16	mult. = − 0·0755	= + ·16
N	A = + 0·867		A = − ·		A = − ·		A = − ·		A = − ·	
	multiplier = − 0·0588	= − ·05	mult. = + 0·0368	= + ·03	mult. = + 0·0294	= + ·03	mult. = − 0·0176	= − ·02	mult. = − 0·0176	= − ·02
	B = − 0·539		B = − ·		B = − ·		B = − ·		B = − ·	
	multiplier = − 0·0776	= + ·04	mult. = − 0·2234	= + ·12	mult. = − 0·1938	= + ·10	mult. = + 0·0025	= − ·00	mult. = + 0·0025	= − ·00
O	A = − 0·290		A = − ·		A = − ·		A = − ·		A = − ·	
	multiplier = − 0·0649	= + ·02	mult. = + 0·0167	= − ·00	mult. = + 0·0158	= − ·00	mult. = − 0·1924	= + ·06	mult. = − 0·1934	= + ·06
	B = − 0·464		B = − ·		B = − ·		B = − ·		B = − ·	
	multiplier = − 0·3477	= + ·16	mult. = − 0·0779	= + ·04	mult. = − 0·0816	= + ·04	mult. = − 0·1826	= + ·08	mult. = − 0·1831	= + ·08
	Total + =	+ 0·59	Total + =	+ 0·28	Total + =	+ 27·01	Total + =	+ 0·30	Total + =	+ 0·30
	Total − =	− 0·25	Total − =	− 0·00	Total − =	− 0·00	Total − =	− 0·39	Total − =	− 0·39
	Total clearance =	+ 0·34	Total clearance =	+ 0·28	Total clearance =	+ 27·01	Total clearance =	− 0·09	Total clearance =	− 0·09
	Uncleared $\Sigma dh \cos(\sigma-\varpi)t$ =	+ 3·25	Uncl. $\Sigma dh \cos 2\sigma t$ =	− 9·65	Uncl. $\Sigma dh \cos 2(\sigma-\eta)t$ =	− 29·39	Uncl. $\Sigma dh \cos \eta t$ =	− 7·57	Uncl. $\Sigma dh \cos 2\eta t$ =	+ 7·40
	$\Sigma dh \cos(\sigma-\varpi)t$ =	+ 3·59	$\Sigma dh \cos 2\sigma t$ =	− 9·37	$\Sigma dh \cos 2(\sigma-\eta)t$ =	− 2·38	$\Sigma dh \cos \eta t$ =	− 7·66	$\Sigma dh \cos 2\eta t$ =	+ 7·31
	Divisor 183·05. 1st approx. A =	+ 0·020	Div. 183·18. 1 ap. C =	− 0·051	Div. 183·19. 1 ap. C′ =	− 0·013	Div. 182·43. 1 ap. E =	− 0·042	Div. 182·43. 1 ap. G =	+ 0·040

	Sine Series.	Products.	Sine Series.	Products.	Sine Series.	Products.	Sine Series.	Products.	Sine Series.	Products.
M_2	A_2 = − ·		A_2 = − ·		A_2 = − ·		A_2 = − ·		A_2 = − ·	
	multiplier = − 0·1708	= − ·61	mult. = + 0·0417	= + ·15	mult. = − 2·8400	= − 10·16	mult. = − 0·0018	= − ·01	mult. = − 0·0035	= − ·01
	B_2 = − ·		B_2 = − ·		B_2 = − ·		B_2 = − ·		B_2 = − ·	
	multiplier = + 0·0441	= − ·10	mult. = + 0·0105	= − ·02	mult. = − 5·7271	= + 12·35	mult. = + 0·0048	= − ·01	mult. = + 0·0096	= − ·02
N	A = − ·		A = − ·		A = − ·		A = − ·		A = − ·	
	multiplier = − 0·0206	= − ·02	mult. = − 0·1525	= − ·13	mult. = − 0·1221	= − ·11	mult. = + 0·0002	= + ·00	mult. = + 0·0004	= + ·00
	B = − ·		B = − ·		B = − ·		B = − ·		B = − ·	
	multiplier = + 0·1138	= − ·06	mult. = − 0·0854	= + ·05	mult. = − 0·0808	= + ·04	mult. = + 0·0001	= − ·00	mult. = + 0·0002	= − ·00
O	A = − ·		A = − ·		A = − ·		A = − ·		A = − ·	
	multiplier = − 0·3452	= + ·10	mult. = + 0·0842	= − ·02	mult. = + 0·0875	= − ·03	mult. = − 0·0046	= + ·00	mult. = − 0·0093	= + ·00
	B = − ·		B = − ·		B = − ·		B = − ·		B = − ·	
	multiplier = + 0·0405	= − ·02	mult. = + 0·0338	= − ·02	mult. = + 0·0330	= − ·02	mult. = + 0·0090	= − ·00	mult. = + 0·0180	= − ·01
	Total + =	+ 0·10	Total + =	+ 0·20	Total + =	+ 12·39	Total + =	+ 0·00	Total + =	+ 0·00
	Total − =	− 0·81	Total − =	− 0·19	Total − =	− 10·32	Total − =	− 0·02	Total − =	− 0·04
	Total clearance =	− 0·71	Total clearance =	+ 0·01	Total clearance =	+ 2·07	Total clearance =	− 0·02	Total clearance =	− 0·04
	Uncleared $\Sigma dh \sin(\sigma-\varpi)t$ =	+ 4·50	Uncl. $\Sigma dh \sin 2\sigma t$ =	− 2·48	Uncl. $\Sigma dh \sin 2(\sigma-\eta)t$ =	− 11·71	Uncl. $\Sigma dh \sin \eta t$ =	+ 0·34	Uncl. $\Sigma dh \sin 2\eta t$ =	+ 2·40
	$\Sigma dh \sin(\sigma-\varpi)t$ =	+ 3·79	$\Sigma dh \sin 2\sigma t$ =	− 2·47	$\Sigma dh \sin 2(\sigma-\eta)t$ =	− 9·64	$\Sigma dh \sin \eta t$ =	+ 0·32	$\Sigma dh \sin 2\eta t$ =	+ 2·36
	Divisor 181·95. 1st approx. B =	+ 0·021	Div. 181·82. 1 ap. D =	− 0·014	Div. 181·81. 1 ap. D′ =	− 0·053	Div. 182·57. 1 ap. F =	+ 0·002	Div. 182·57. 1 ap. H =	+ 0·013

FORMS FOR LONG-PERIOD TIDES.

EVALUATION OF LONG-PERIOD TIDES.

$\Sigma_0^{361}dh \times \cos(\sigma-\varpi)t =$	+3·59	= +183·05A	+ 2·14B	+ 0·73C	+ 4·29D	+ 0·77C′	+ 5·04D′	+ 4·88E	− 0·34F	+ 4·96G	− 0·69H
	+3·59	= 183·05A	+ ·04	− ·04	− ·06	− ·01	− ·27	− ·20	− ·00	+ ·20	− ·01
	+3·94	= 183·05A									
	+0·022	= A									
$\Sigma_0^{361}dh \times \sin(\sigma-\varpi)t =$	+3·79	= + 2·14A	+181·95B	− 4·15C	+ 1·02D	− 4·90C′	+ 1·07D′	+ 3·80E	+ 0·34F	+ 3·88G	+ 0·69H
	+3·79	= + ·05	+181·95B	+ ·21	− ·01	+ ·06	− ·06	− ·16	+ ·00	+ ·16	+ ·01
	+3·53	= 181·95B									
	+0·019	= B									
$\Sigma_0^{361}dh \times \cos 2\sigma t =$	−9·37	= + 0·73A	− 4·15B	+183·18C	+ 0·88D	+ 0·61C′	+ 0·92D′	− 1·50E	− 0·10F	− 1·51G	− 0·19H
	−9·37	= + ·02	− ·08	+183·18C	− ·01	− ·01	− ·05	+ ·06	− ·00	− ·06	− ·00
	−9·24	= 183·18C									
	−0·050	= C									
$\Sigma_0^{361}dh \times \sin 2\sigma t =$	−2·47	= + 4·29A	+ 1·02B	+ 0·88C	+181·82D	+ 6·92C′	− 0·75D′	+ 3·05E	− 0·08F	+ 3·06G	− 0·17H
	−2·47	= + ·09	+ ·02	− ·04	+181·82D	− ·01	+ ·04	− ·13	− ·00	+ ·12	− ·00
	−2·56	= 181·82D									
	−0·014	= D									
$\Sigma_0^{361}dh \times \cos 2(\sigma-\eta)t =$	−2·38	= + 0·77A	− 4·90B	+ 0·61C	+ 0·92D	+183·19C′	+ 0·97D′	− 1·68E	− 0·11F	− 1·70G	− 0·23H
	−2·38	= + ·02	− ·09	− ·03	− ·01	+183·19C′	− ·05	+ ·07	− ·00	− ·07	− ·00
	−2·22	= 183·19C′									
	−0·012	= C′									
$\Sigma_0^{361}dh \times \sin 2(\sigma-\eta)t =$	−9·64	= + 5·04A	+ 1·07B	+ 0·92C	− 0·75D	+ 0·97C′	+181·81D′	+ 3·25E	− 0·10F	+ 3·27G	− 0·23H
	−9·64	= + ·11	+ ·02	− ·05	+ ·01	− ·01	+181·81D′	− ·14	− ·00	+ ·13	− ·00
	−9·71	= 181·81D′									
	−0·053	= D′									
$\Sigma_0^{361}dh \times \cos \eta t =$	−7·66	= + 4·88A	+ 3·80B	− 1·50C	+ 3·05D	− 1·68C′	+ 3·25D′	+182·43E	+ 0·00F	− 0·14G	+ 0·00H
	−7·66	= + ·11	+ ·07	+ ·08	− ·04	+ ·02	− ·17	+182·43E	+ ·00	− ·01	+ ·00
	−7·72	= 182·43E									
	−0·042	= E									
$\Sigma_0^{361}dh \times \sin \eta t =$	+0·32	= − 0·34A	+ 0·34B	− 0·10C	− 0·08D	− 0·11C′	− 0·10D′	+ 0·00E	+182·57F	+ 0·00G	+ 0·00H
	+0·32	= − ·01	+ ·01	+ ·01	+ ·00	+ ·00	+ ·01	− ·00	+182·57F	+ ·00	+ ·00
	+0·30	= 182·57F									
	+0·002	= F									
$\Sigma_0^{361}dh \times \cos 2\eta t =$	+7·31	= + 4·96A	+ 3·88B	− 1·51C	+ 3·06D	− 1·70C′	+ 3·27D′	− 0·14E	+ 0·00F	+182·43G	+ 0·00H
	+7·31	= + ·11	+ ·07	+ ·08	− ·04	+ ·02	− ·17	+ ·01	− ·00	+182·43G	+ ·00
	+7·23	= 182·43G									
	+0·040	= G									
$\Sigma_0^{361}dh \times \sin 2\eta t =$	+2·36	= − 0·69A	+ 0·69B	− 0·19C	− 0·17D	− 0·23C′	− 0·23D′	+ 0·00E	+ 0·00F	+ 0·00G	+182·57H
	+2·36	= − ·02	+ ·01	+ ·01	+ ·00	+ ·00	+ ·01	− ·00	− ·00	+ ·00	+182·57H
	+2·35	= 182·57H									
	+0·013	= H									

Lunar Monthly Mm.		Lunar Fortnightly Mf.		Luni-solar Fortnightly MSf.		Solar Annual Sa.		Solar Semi-annual Ssa.	
Log B =	+8·27875	Log D =	−8·14613	Log D′ =	−8·72428	Log F =	+7·30103	Log H =	+8·11394
Log A =	+8·34242	Log C =	−8·69897	Log C′ =	−8·07918	Log E =	−8·62325	Log G =	+8·60206
L tan ζ_1 =	+9·93633	L tan ζ_1 =	+9·44716	L tan ζ_1 =	+0·64510	Tan ζ_1 =	−8·67778	Tan ζ_1 =	+9·51188
ζ_1 =	40°·815	ζ_1 =	195°·642	ζ_1 =	257°·243	ζ_1 =	177°·274	ζ_1 =	18°·004
Motion for 11⅓^h =	6·260	Motion for 11⅓^h =	12·627	Motion for 11⅓^h =	11·683	Motion for 11⅓^h =	0·472	Motion for 11⅓^h =	0·945
ζ =	47·075	ζ =	208·269	ζ =	268·926	ζ =	177·746	ζ =	18·949
$V_0 + u$ =	16·507	$V_0 + u$ =	201·066	$V_0 + u$ =	359·114	$V_0 + u$ =	281·103	$V_0 + u$ =	202·206
κ =	63·582	κ =	49·335	κ =	268·040	κ =	98·849	κ =	221·155
B^2 =	0·000361	D^2 =	0·000196	$(D')^2$ =	0·002809	F^2 =	0·000004	H^2 =	0·000169
A^2 =	0·000484	C^2 =	0·002500	$(C')^2$ =	0·000144	E^2 =	0·001764	G^2 =	0·001600
Sum = R^2 =	0·000845	Sum = R^2 =	0·002696	Sum = R^2 =	0·002953	Sum = R^2 =	0·001768	Sum = R^2 =	0·001769
$\frac{1}{f}$ =	0·884	$\frac{1}{f}$ =	1·599	$\frac{1}{f}$ =	0·964	R = H =	0·042	R = H =	0·042
H =	0·026	H =	0·083	H =	0·052				
R =	0·029	R =	0·052	R =	0·054				

AUXILIARY TABLES.

TABLE I.—For converting Decimals of a Degree into Minutes and Seconds.

1

Parts of a Degree	Minutes
·1	6
·2	12
·3	18
·4	24
·5	30
·6	36
·7	42
·8	48
·9	54

2

Parts of a Degree	Minutes	Seconds	Parts of a Degree	Minutes	Seconds	Parts of a Degree	Minutes	Seconds
·001	0	3·6	·034	2	2·4	·067	4	1·2
2	0	7·2	35	2	6·0	68	4	4·8
3	0	10·8	36	2	9·6	69	4	8·4
4	0	14·4	37	2	13·2	·070	4	12·0
5	0	18·0	38	2	16·8	71	4	15·6
6	0	21·6	39	2	20·4	72	4	19·2
7	0	25·2	·040	2	24·0	73	4	22·8
8	0	28·8	41	2	27·6	74	4	26·4
9	0	32·4	42	2	31·2	75	4	30·0
·010	0	36·0	43	2	34·8	76	4	33·6
11	0	39·6	44	2	38·4	77	4	37·2
12	0	43·2	45	2	42·0	78	4	40·8
13	0	46·8	46	2	45·6	79	4	44·4
14	0	50·4	47	2	49·2	·080	4	48·0
15	0	54·0	48	2	52·8	81	4	51·6
16	0	57·6	49	2	56·4	82	4	55·2
17	1	1·2	·050	3	0·0	83	4	58·8
18	1	4·8	51	3	3·6	84	5	2·4
19	1	8·4	52	3	7·2	85	5	6·0
·020	1	12·0	53	3	10·8	86	5	9·6
21	1	15·6	54	3	14·4	87	5	13·2
22	1	19·2	55	3	18·0	88	5	16·8
23	1	22·8	56	3	21·6	89	5	20·4
24	1	26·4	57	3	25·2	·090	5	24·0
25	1	30·0	58	3	28·8	91	5	27·6
26	1	33·6	59	3	32·4	92	5	31·2
27	1	37·2	·060	3	36·0	93	5	34·8
28	1	40·8	61	3	39·6	94	5	38·4
29	1	44·4	62	3	43·2	95	5	42·0
·030	1	48·0	63	3	46·8	96	5	45·6
31	1	51·6	64	3	50·4	97	5	49·2
32	1	55·2	65	3	54·0	98	5	52·8
33	1	58·8	66	3	57·6	99	5	56·4

TABLE II.—For converting Minutes and Seconds into Decimals of a Degree.

Minutes	Decimals of a Degree	Seconds and Decimals of Seconds	Decimals of a Degree correct to three places	Actual value of Decimals of a Degree	Minutes	Decimals of a Degree	Seconds and Decimals of Seconds	Decimals of a Degree correct to three places	Actual value of Decimals of a Degree
0	·0	0·0	·000	·0000	3	·0	1·8	·051	·0505
6	·1	1·8	·001	·0005	9	·1	5·4	·052	·0515
12	·2	5·4	·002	·0015	15	·2	9·0	·053	·0525
18	·3	9·0	·003	·0025	21	·3	12·6	·054	·0535
24	·4	12·6	·004	·0035	27	·4	16·2	·055	·0545
30	·5	16·2	·005	·0045	33	·5	19·8	·056	·0555
36	·6	19·8	·006	·0055	39	·6	23·4	·057	·0565
42	·7	23·4	·007	·0065	45	·7	27·0	·058	·0575
48	·8	27·0	·008	·0075	51	·8	30·6	·059	·0585
54	·9	30·6	·009	·0085	57	·9	34·2	·060	·0595
		34·2	·010	·0095			37·8	·061	·0605
		37·8	·011	·0105			41·4	·062	·0615
		41·4	·012	·0115			45·0	·063	·0625
		45·0	·013	·0125			48·6	·064	·0635
		48·6	·014	·0135			52·2	·065	·0645
		52·2	·015	·0145			55·8	·066	·0655
		55·8	·016	·0155			59·4		·0665
		59·4		·0165					
			·017					·067	
1	·0	3·0	·018	·0175	4	·0	3·0	·068	·0675
7	·1	6·6	·019	·0185	10	·1	6·6	·069	·0685
13	·2	10·2	·020	·0195	16	·2	10·2	·070	·0695
19	·3	13·8	·021	·0205	22	·3	13·8	·071	·0705
25	·4	17·4	·022	·0215	28	·4	17·4	·072	·0715
31	·5	21·0	·023	·0225	34	·5	21·0	·073	·0725
37	·6	24·6	·024	·0235	40	·6	24·6	·074	·0735
43	·7	28·2	·025	·0245	46	·7	28·2	·075	·0745
49	·8	31·8	·026	·0255	52	·8	31·8	·076	·0755
55	·9	35·4	·027	·0265	58	·9	35·4	·077	·0765
		39·0	·028	·0275			39·0	·078	·0775
		42·6	·029	·0285			42·6	·079	·0785
		46·2	·030	·0295			46·2	·080	·0795
		49·8	·031	·0305			49·8	·081	·0805
		53·4	·032	·0315			53·4	·082	·0815
		57·0		·0325			57·0		·0825
			·033					·083	
2	·0	0·6	·034	·0335	5	·0	0·6	·084	·0835
8	·1	4·2	·035	·0345	11	·1	4·2	·085	·0845
14	·2	7·8	·036	·0355	17	·2	7·8	·086	·0855
20	·3	11·4	·037	·0365	23	·3	11·4	·087	·0865
26	·4	15·0	·038	·0375	29	·4	15·0	·088	·0875
32	·5	18·6	·039	·0385	35	·5	18·6	·089	·0885
38	·6	22·2	·040	·0395	41	·6	22·2	·090	·0895
44	·7	25·8	·041	·0405	47	·7	25·8	·091	·0905
50	·8	29·4	·042	·0415	53	·8	29·4	·092	·0915
56	·9	33·0	·043	·0425	59	·9	33·0	·093	·0925
		36·6	·044	·0435			36·6	·094	·0935
		40·2	·045	·0445			40·2	·095	·0945
		43·8	·046	·0455			43·8	·096	·0955
		47·4	·047	·0465			47·4	·097	·0965
		51·0	·048	·0475			51·0	·098	·0975
		54·6	·049	·0485			54·6	·099	·0985
		58·2	·050	·0495			58·2	·100	·0995
3	·0	1·8		·0505	6	...	1·8		·1005

AUXILIARY TABLES.

TABLE III.—Values of p the Mean Longitude of the Moon's Perigee (the π of the computation forms) for every year from 1850 to 1949.

Year	p or π	Year	p or π	Year	p or π	Year	p or π
	°		°		°		°
1850	99·72920	1875	36·96088	1900	334·19130	1925	271·42549
51	140·39176	76	77·73479	1	14·85396	26	312·08810
52	181·16571	77	118·39729	2	55·51661	27	352·75070
53	221·82826	78	159·05979	3	96·17926	28	33·52471
54	262·49081	79	199·72229	4	136·95331	29	74·18731
1855	303·15336	1880	240·49619	1905	177·61596	1930	114·84990
56	343·92731	81	281·15868	6	218·27861	31	155·51250
57	24·58985	82	321·82118	7	258·94125	32	196·28649
58	65·25239	83	2·48367	8	299·71529	33	236·94908
59	105·91493	84	43·25756	9	340·37793	34	277·61167
1860	146·68887	1885	83·92004	1910	21·04057	1935	318·27426
61	187·35140	86	124·58253	11	61·70320	36	359·04825
62	228·01393	87	165·24501	12	102·47724	37	39·71083
63	268·67646	88	206·01889	13	143·13987	38	80·37341
64	309·45040	89	246·68137	14	183·80250	39	121·03599
1865	350·11292	1890	287·34385	1915	224·46513	1940	161·80997
66	30·77545	91	328·00632	16	265·23915	41	202·47254
67	71·43797	92	8·78020	17	305·90178	42	243·13512
68	112·21189	93	49·44267	18	346·56440	43	283·79769
69	152·87441	94	90·10514	19	27·22702	44	324·57166
1870	193·53693	1895	130·76760	1920	68·00104	1945	5·23423
71	234·19944	96	171·54147	21	108·66365	46	45·89679
72	274·97336	97	212·20393	22	149·32626	47	86·55935
73	315·63587	98	252·86639	23	189·98888	48	127·33332
74	356·29838	99	293·52885	24	230·76289	49	167·99588

These values are for January 0 (*i.e.*, noon December 31st of preceding year), except in the case of leap-years, when the values are for 0 hour January 1st.

The values given in the above table require 0°·136 to be added to give the true values of p or π (see page 36, Preface to Hansen's Tables), but as the form for the computation of tidal observations has been constructed showing the constant 0°·136 to be added, it has been thought advisable not to make this correction in the above table.

If 109°·02050 is added to the values of the Years 1900—1949 the values for the Years 2000—2049 will be obtained.

TABLE IV.—Number of Days from January 0.

Month	Common year	Leap-year	Month	Common year	Leap-year
January 0 ...	0	−1	July 0 ...	181	181
February 0 ...	31	30	August 0 ...	212	212
March 0 ...	59	59	September 0 ...	243	243
April 0 ...	90	90	October 0 ...	273	273
May 0 ...	120	120	November 0 ...	304	304
June 0 ...	151	151	December 0 ...	334	334

TABLE V.—Value of Movement of p or π for 1 to 366 Days.

Days	π	Days	π	Days	π	Days	π	Days	π	Days	π
	°		°		°		°		°		°
1	0·11140	62	6·90708	123	13·70276	184	20·49844	245	27·29411	306	34·08979
2	0·22281	63	7·01849	124	13·81416	185	20·60984	246	27·40552	307	34·20119
3	0·33421	64	7·12989	125	13·92557	186	20·72124	247	27·51692	308	34·31260
4	0·44562	65	7·24130	126	14·03697	187	20·83265	248	27·62833	309	34·42400
5	0·55702	66	7·35270	127	14·14838	188	20·94405	249	27·73973	310	34·53541
6	0·66843	67	7·46410	128	14·25978	189	21·05546	250	27·85113	311	34·64681
7	0·77983	68	7·57551	129	14·37119	190	21·16686	251	27·96254	312	34·75822
8	0·89124	69	7·68691	130	14·48259	191	21·27827	252	28·07394	313	34·86962
9	1·00264	70	7·79832	131	14·59399	192	21·38967	253	28·18535	314	34·98102
10	1·11405	71	7·90972	132	14·70540	193	21·50108	254	28·29675	315	35·09243
11	1·22545	72	8·02113	133	14·81680	194	21·61248	255	28·40816	316	35·20383
12	1·33685	73	8·13253	134	14·92821	195	21·72389	256	28·51956	317	35·31524
13	1·44826	74	8·24394	135	15·03961	196	21·83529	257	28·63097	318	35·42664
14	1·55966	75	8·35534	136	15·15102	197	21·94669	258	28·74237	319	35·53805
15	1·67107	76	8·46675	137	15·26242	198	22·05810	259	28·85378	320	35·64945
16	1·78247	77	8·57815	138	15·37383	199	22·16950	260	28·96518	321	35·76086
17	1·89388	78	8·68955	139	15·48523	200	22·28091	261	29·07658	322	35·87226
18	2·00528	79	8·80096	140	15·59664	201	22·39231	262	29·18799	323	35·98367
19	2·11669	80	8·91236	141	15·70804	202	22·50372	263	29·29939	324	36·09507
20	2·22809	81	9·02377	142	15·81944	203	22·61512	264	29·41080	325	36·20647
21	2·33950	82	9·13517	143	15·93085	204	22·72653	265	29·52220	326	36·31788
22	2·45090	83	9·24658	144	16·04225	205	22·83793	266	29·63361	327	36·42928
23	2·56230	84	9·35798	145	16·15366	206	22·94933	267	29·74501	328	36·54069
24	2·67371	85	9·46939	146	16·26506	207	23·06074	268	29·85642	329	36·65209
25	2·78511	86	9·58079	147	16·37647	208	23·17214	269	29·96782	330	36·76350
26	2·89652	87	9·69219	148	16·48787	209	23·28355	270	30·07923	331	36·87490
27	3·00792	88	9·80360	149	16·59928	210	23·39495	271	30·19063	332	36·98631
28	3·11933	89	9·91500	150	16·71068	211	23·50636	272	30·30203	333	37·09771
29	3·23073	90	10·02641	151	16·82209	212	23·61776	273	30·41344	334	37·20912
30	3·34214	91	10·13781	152	16·93349	213	23·72917	274	30·52484	335	37·32052
31	3·45354	92	10·24922	153	17·04489	214	23·84057	275	30·63625	336	37·43192
32	3·56495	93	10·36062	154	17·15630	215	23·95198	276	30·74765	337	37·54333
33	3·67635	94	10·47203	155	17·26770	216	24·06338	277	30·85906	338	37·65473
34	3·78775	95	10·58343	156	17·37911	217	24·17478	278	30·97046	339	37·76614
35	3·89916	96	10·69484	157	17·49051	218	24·28619	279	31·08187	340	37·87754
36	4·01056	97	10·80624	158	17·60192	219	24·39759	280	31·19327	341	37·98895
37	4·12197	98	10·91765	159	17·71332	220	24·50900	281	31·30468	342	38·10035
38	4·23337	99	11·02905	160	17·82473	221	24·62040	282	31·41608	343	38·21176
39	4·34478	100	11·14045	161	17·93613	222	24·73181	283	31·52748	344	38·32316
40	4·45618	101	11·25186	162	18·04753	223	24·84321	284	31·63889	345	38·43457
41	4·56759	102	11·36326	163	18·15894	224	24·95462	285	31·75029	346	38·54597
42	4·67899	103	11·47467	164	18·27034	225	25·06602	286	31·86170	347	38·65737
43	4·79040	104	11·58607	165	18·38175	226	25·17743	287	31·97310	348	38·76878
44	4·90180	105	11·69748	166	18·49315	227	25·28883	288	32·08451	349	38·88018
45	5·01320	106	11·80888	167	18·60456	228	25·40023	289	32·19591	350	38·99159
46	5·12461	107	11·92029	168	18·71596	229	25·51164	290	32·30732	351	39·10299
47	5·23601	108	12·03169	169	18·82737	230	25·62304	291	32·41872	352	39·21440
48	5·34742	109	12·14309	170	18·93877	231	25·73445	292	32·53012	353	39·32580
49	5·45882	110	12·25450	171	19·05018	232	25·84585	293	32·64153	354	39·43721
50	5·57023	111	12·36590	172	19·16158	233	25·95726	294	32·75293	355	39·54861
51	5·68163	112	12·47731	173	19·27299	234	26·06866	295	32·86434	356	39·66002
52	5·79304	113	12·58871	174	19·38439	235	26·18007	296	32·97574	357	39·77142
53	5·90444	114	12·70012	175	19·49579	236	26·29147	297	33·08715	358	39·88282
54	6·01585	115	12·81152	176	19·60720	237	26·40288	298	33·19855	359	39·99423
55	6·12725	116	12·92293	177	19·71860	238	26·51428	299	33·30996	360	40·10563
56	6·23865	117	13·03433	178	19·83001	239	26·62568	300	33·42136	361	40·21704
57	6·35006	118	13·14574	179	19·94141	240	26·73709	301	33·53277	362	40·32844
58	6·46146	119	13·25714	180	20·05282	241	26·84849	302	33·64417	363	40·43985
59	6·57287	120	13·36854	181	20·16422	242	26·95990	303	33·75557	364	40·55125
60	6·68427	121	13·47995	182	20·2756[illegible]	243	27·07130	304	33·86698	365	40·66266
61	6·79568	122	13·5913[illegible]	183	20·3870[illegible]	244	27·18271	305	33·97838	366	40·77406

Auxiliary Tables.

Table VI.—Value of the Movement of p or π for differences of Longitude, Greenwich.

Difference of Longitude	Value of π	Actual values of π corresponding to Degrees in Column I	Difference of Longitude	Value of π	Actual values of π corresponding to Degrees in Column I
°	°	°	°	°	°
0·000	·000	·0000	88·865	·028	·0275
1·616	·001	·0005	92·097	·029	·0285
4·847	·002	·0015	95·328	·030	·0295
8·079	·003	·0025	98·560	·031	·0305
11·310	·004	·0035	101·791	·032	·0315
14·542	·005	·0045	105·023	·033	·0325
17·773	·006	·0055	108·254	·034	·0335
21·005	·007	·0065	111·486	·035	·0345
24·236	·008	·0075	114·717	·036	·0355
27·467	·009	·0085	117·949	·037	·0365
30·699	·010	·0095	121·180	·038	·0375
33·930	·011	·0105	124·411	·039	·0385
37·162	·012	·0115	127·643	·040	·0395
40·393	·013	·0125	130·874	·041	·0405
43·625	·014	·0135	134·106	·042	·0415
46·856	·015	·0145	137·337	·043	·0425
50·088	·016	·0155	140·569	·044	·0435
53·319	·017	·0165	143·800	·045	·0445
56·551	·018	·0175	147·032	·046	·0455
59·782	·019	·0185	150·263	·047	·0465
63·014	·020	·0195	153·495	·048	·0475
66·245	·021	·0205	156·726	·049	·0485
69·477	·022	·0215	159·958	·050	·0495
72·708	·023	·0225	163·189	·051	·0505
75·939	·024	·0235	166·421	·052	·0515
79·171	·025	·0245	169·652	·053	·0525
82·402	·026	·0255	172·884	·054	·0535
85·634	·027	·0265	176·115	·055	·0545
88·865		·0275	179·346	·056	·0555
			182·578		·0565

Correction for E. Longitude −, for W. Longitude +.

Table VII.—Products of Augmenting Factors R_1, R_2, and R_4, multiplied by 1 to 99.

$R_1 = ·0028$.

	0	10	20	30	40	50	60	70	80	90	
0	·0000	·0280	·0560	·0840	·1120	·1400	·1680	·1960	·2240	·2520	0
1	·0028	·0308	·0588	·0868	·1148	·1428	·1708	·1988	·2268	·2548	1
2	·0056	·0336	·0616	·0896	·1176	·1456	·1736	·2016	·2296	·2576	2
3	·0084	·0364	·0644	·0924	·1204	·1484	·1764	·2044	·2374	·2604	3
4	·0112	·0392	·0672	·0952	·1232	·1512	·1792	·2072	·2352	·2632	4
5	·0140	·0420	·0700	·0980	·1260	·1540	·1820	·2100	·2380	·2660	5
6	·0168	·0448	·0728	·1008	·1288	·1568	·1848	·2128	·2408	·2688	6
7	·0196	·0476	·0756	·1036	·1316	·1596	·1876	·2156	·2436	·2716	7
8	·0224	·0504	·0784	·1064	·1344	·1624	·1904	·2184	·2464	·2744	8
9	·0252	·0532	·0812	·1092	·1372	·1652	·1932	·2212	·2492	·2772	9

$R_2 = ·0115$.

	0	10	20	30	40	50	60	70	80	90	
0	·0000	·1150	·2300	·3450	·4600	·5750	·6900	·8050	·9200	1·0350	0
1	·0115	·1265	·2415	·3565	·4715	·5865	·7015	·8165	·9315	1·0465	1
2	·0230	·1380	·2530	·3680	·4830	·5980	·7130	·8280	·9430	1·0580	2
3	·0345	·1495	·2645	·3795	·4945	·6095	·7245	·8395	·9545	1·0695	3
4	·0460	·1610	·2760	·3910	·5060	·6210	·7360	·8510	·9660	1·0810	4
5	·0575	·1725	·2875	·4025	·5175	·6325	·7475	·8625	·9775	1·0925	5
6	·0690	·1840	·2990	·4140	·5290	·6440	·7590	·8740	·9890	1·1040	6
7	·0805	·1955	·3105	·4255	·5405	·6555	·7705	·8855	1·0005	1·1155	7
8	·0920	·2070	·3220	·4370	·5520	·6670	·7820	·8970	1·0120	1·1270	8
9	·1035	·2185	·3335	·4485	·5635	·6785	·7935	·9085	1·0235	1·1385	9

$R_4 = ·0472$.

	0	10	20	30	40	50	60	70	80	90	
0	·0000	·4720	·9440	1·4160	1·8880	2·3600	2·8320	3·3040	3·7760	4·2480	0
1	·0472	·5192	·9912	1·4632	1·9352	2·4072	2·8792	3·3512	3·8232	4·2952	1
2	·0944	·5664	1·0384	1·5104	1·9824	2·4544	2·9264	3·3984	3·8704	4·3424	2
3	·1416	·6136	1·0856	1·5576	2·0296	2·5016	2·9736	3·4456	3·9176	4·3896	3
4	·1888	·6608	1·1328	1·6048	2·0768	2·5488	3·0208	3·4928	3·9648	4·4368	4
5	·2360	·7080	1·1800	1·6520	2·1240	2·5960	3·0680	3·5400	4·0120	4·4840	5
6	·2832	·7552	1·2272	1·6992	2·1712	2·6432	3·1152	3·5872	4·0592	4·5312	6
7	·3304	·8024	1·2744	1·7464	2·2184	2·6904	3·1624	3·6344	4·1064	4·5784	7
8	·3776	·8496	1·3216	1·7936	2·2656	2·7376	3·2096	3·6816	4·1536	4·6256	8
9	·4248	·8968	1·3688	1·8408	2·3128	2·7848	3·2568	3·7288	4·2008	4·6728	9

AUXILIARY TABLES.

TABLE VIII.—Products of $S_1 \times \cdot 001$ up to $S_1 \times 1\cdot 000$. $S_1 = \sin 15^\circ = \cdot 25882$.

No.	·000	·001	·002	·003	·004	·005	·006	·007	·008	·009	No.
·00	·000000	·000259	·000518	·000776	·001035	·001294	·001553	·001812	·002071	·002329	·00
·01	·002588	·002847	·003106	·003365	·003623	·003882	·004141	·004400	·004659	·004918	·01
·02	·005176	·005435	·005694	·005953	·006212	·006471	·006729	·006988	·007247	·007506	·02
·03	·007765	·008023	·008282	·008541	·008800	·009059	·009318	·009576	·009835	·010094	·03
·04	·010353	·010612	·010870	·011129	·011388	·011647	·011906	·012165	·012423	·012682	·04
·05	·012941	·013200	·013459	·013717	·013976	·014235	·014494	·014753	·015012	·015270	·05
·06	·015529	·015788	·016047	·016306	·016564	·016823	·017082	·017341	·017600	·017859	·06
·07	·018117	·018376	·018635	·018894	·019153	·019412	·019670	·019929	·020188	·020447	·07
·08	·020706	·020964	·021223	·021482	·021741	·022000	·022259	·022517	·022776	·023035	·08
·09	·023294	·023553	·023811	·024070	·024329	·024588	·024847	·025106	·025364	·025623	·09
·10	·025882	·026141	·026400	·026658	·026917	·027176	·027435	·027694	·027953	·028211	·10
·11	·028470	·028729	·028988	·029247	·029505	·029764	·030023	·030282	·030541	·030800	·11
·12	·031058	·031317	·031576	·031835	·032094	·032353	·032611	·032870	·033129	·033388	·12
·13	·033647	·033905	·034164	·034423	·034682	·034941	·035200	·035458	·035717	·035976	·13
·14	·036235	·036494	·036752	·037011	·037270	·037529	·037788	·038047	·038305	·038564	·14
·15	·038823	·039082	·039341	·039599	·039858	·040117	·040376	·040635	·040894	·041152	·15
·16	·041411	·041670	·041929	·042188	·042446	·042705	·042964	·043223	·043482	·043741	·16
·17	·043999	·044258	·044517	·044776	·045035	·045294	·045552	·045811	·046070	·046329	·17
·18	·046588	·046846	·047105	·047364	·047623	·047882	·048141	·048399	·048658	·048917	·18
·19	·049176	·049435	·049693	·049952	·050211	·050470	·050729	·050988	·051246	·051505	·19
·20	·051764	·052023	·052282	·052540	·052799	·053058	·053317	·053576	·053835	·054093	·20
·21	·054352	·054611	·054870	·055129	·055387	·055646	·055905	·056164	·056423	·056682	·21
·22	·056940	·057199	·057458	·057717	·057976	·058235	·058493	·058752	·059011	·059270	·22
·23	·059529	·059787	·060046	·060305	·060564	·060823	·061082	·061340	·061599	·061858	·23
·24	·062117	·062376	·062634	·062893	·063152	·063411	·063670	·063929	·064187	·064446	·24
·25	·064705	·064964	·065223	·065481	·065740	·065999	·066258	·066517	·066776	·067034	·25
·26	·067293	·067552	·067811	·068070	·068328	·068587	·068846	·069105	·069364	·069623	·26
·27	·069881	·070140	·070399	·070658	·070917	·071176	·071434	·071693	·071952	·072211	·27
·28	·072470	·072728	·072987	·073246	·073505	·073764	·074023	·074281	·074540	·074799	·28
·29	·075058	·075317	·075575	·075834	·076093	·076352	·076611	·076870	·077128	·077387	·29
·30	·077646	·077905	·078164	·078422	·078681	·078940	·079199	·079458	·079717	·079975	·30
·31	·080234	·080493	·080752	·081011	·081269	·081528	·081787	·082046	·082305	·082564	·31
·32	·082822	·083081	·083340	·083599	·083858	·084117	·084375	·084634	·084893	·085152	·32
·33	·085411	·085669	·085928	·086187	·086446	·086705	·086964	·087222	·087481	·087740	·33
·34	·087999	·088258	·088516	·088775	·089034	·089293	·089552	·089811	·090069	·090328	·34
·35	·090587	·090846	·091105	·091363	·091622	·091881	·092140	·092399	·092658	·092916	·35
·36	·093175	·093434	·093693	·093952	·094210	·094469	·094728	·094987	·095246	·095505	·36
·37	·095763	·096022	·096281	·096540	·096799	·097058	·097316	·097575	·097834	·098093	·37
·38	·098352	·098610	·098869	·099128	·099387	·099646	·099905	·100163	·100422	·100681	·38
·39	·100940	·101199	·101457	·101716	·101975	·102234	·102493	·102752	·103010	·103269	·39
·40	·103528	·103787	·104046	·104304	·104563	·104822	·105081	·105340	·105599	·105857	·40
·41	·106116	·106375	·106634	·106893	·107151	·107410	·107669	·107928	·108187	·108446	·41
·42	·108704	·108963	·109222	·109481	·109740	·109999	·110257	·110516	·110775	·111034	·42
·43	·111293	·111551	·111810	·112069	·112328	·112587	·112846	·113104	·113363	·113622	·43
·44	·113881	·114140	·114398	·114657	·114916	·115175	·115434	·115693	·115951	·116210	·44
·45	·116469	·116728	·116987	·117245	·117504	·117763	·118022	·118281	·118540	·118798	·45
·46	·119057	·119316	·119575	·119834	·120092	·120351	·120610	·120869	·121128	·121387	·46
·47	·121645	·121904	·122163	·122422	·122681	·122940	·123198	·123457	·123716	·123975	·47
·48	·124234	·124492	·124751	·125010	·125269	·125528	·125787	·126045	·126304	·126563	·48
·49	·126822	·127081	·127339	·127598	·127857	·128116	·128375	·128634	·128892	·129151	·49
·50	·129410	·129669	·129928	·130186	·130445	·130704	·130963	·131222	·131481	·131739	·50
·51	·131998	·132257	·132516	·132775	·133033	·133292	·133551	·133810	·134069	·134328	·51
·52	·134586	·134845	·135104	·135363	·135622	·135881	·136139	·136398	·136657	·136916	·52
·53	·137175	·137433	·137692	·137951	·138210	·138469	·138728	·138986	·139245	·139504	·53
·54	·139763	·140022	·140280	·140539	·140798	·141057	·141316	·141575	·141833	·142092	·54
·55	·142351	·142610	·142869	·143127	·143386	·143645	·143904	·144163	·144422	·144680	·55
·56	·144939	·145198	·145457	·145716	·145974	·146233	·146492	·146751	·147010	·147269	·56
·57	·147527	·147786	·148045	·148304	·148563	·148822	·149080	·149339	·149598	·149857	·57
·58	·150116	·150374	·150633	·150892	·151151	·151410	·151669	·151927	·152186	·152445	·58
·59	·152704	·152963	·153221	·153480	·153739	·153998	·154257	·154516	·154774	·155033	·59
·60	·155292	·155551	·155810	·156068	·156327	·156586	·156845	·157104	·157363	·157621	·60
·61	·157880	·158139	·158398	·158657	·158915	·159174	·159433	·159692	·159951	·160210	·61
·62	·160468	·160727	·160986	·161245	·161504	·161763	·162021	·162280	·162539	·162798	·62
·63	·163057	·163315	·163574	·163833	·164092	·164351	·164610	·164868	·165127	·165386	·63
·64	·165645	·165904	·166162	·166421	·166680	·166939	·167198	·167457	·167715	·167974	·64
·65	·168233	·168492	·168751	·169009	·169268	·169527	·169786	·170045	·170304	·170562	·65
·66	·170821	·171080	·171339	·171598	·171856	·172115	·172374	·172633	·172892	·173151	·66
·67	·173409	·173668	·173927	·174186	·174445	·174704	·174962	·175221	·175480	·175739	·67
·68	·175998	·176256	·176515	·176774	·177033	·177292	·177551	·177809	·178068	·178327	·68
·69	·178586	·178845	·179103	·179362	·179621	·179880	·180139	·180398	·180656	·180915	·69
·70	·181174	·181433	·181692	·181950	·182209	·182468	·182727	·182986	·183245	·183503	·70
·71	·183762	·184021	·184280	·184539	·184797	·185056	·185315	·185574	·185833	·186092	·71
·72	·186350	·186609	·186868	·187127	·187386	·187645	·187903	·188162	·188421	·188680	·72
·73	·188939	·189197	·189456	·189715	·189974	·190233	·190492	·190750	·191009	·191268	·73
·74	·191527	·191786	·192044	·192303	·192562	·192821	·193080	·193339	·193597	·193856	·74
·75	·194115	·194374	·194633	·194891	·195150	·195409	·195668	·195927	·196186	·196444	·75
·76	·196703	·196962	·197221	·197480	·197738	·197997	·198256	·198515	·198774	·199033	·76
·77	·199291	·199550	·199809	·200068	·200327	·200586	·200844	·201103	·201362	·201621	·77
·78	·201880	·202138	·202397	·202656	·202915	·203174	·203433	·203691	·203950	·204209	·78
·79	·204468	·204727	·204985	·205244	·205503	·205762	·206021	·206280	·206538	·206797	·79
·80	·207056	·207315	·207574	·207832	·208091	·208350	·208609	·208868	·209127	·209385	·80
·81	·209644	·209903	·210162	·210421	·210679	·210938	·211197	·211456	·211715	·211974	·81
·82	·212232	·212491	·212750	·213009	·213268	·213527	·213785	·214044	·214303	·214562	·82
·83	·214821	·215079	·215338	·215597	·215856	·216115	·216374	·216632	·216891	·217150	·83
·84	·217409	·217668	·217926	·218185	·218444	·218703	·218962	·219221	·219479	·219738	·84
·85	·219997	·220256	·220515	·220773	·221032	·221291	·221550	·221809	·222068	·222326	·85
·86	·222585	·222844	·223103	·223362	·223620	·223879	·224138	·224397	·224656	·224915	·86
·87	·225173	·225432	·225691	·225950	·226209	·226468	·226726	·226985	·227244	·227503	·87
·88	·227762	·228020	·228279	·228538	·228797	·229056	·229315	·229573	·229832	·230091	·88
·89	·230350	·230609	·230867	·231126	·231385	·231644	·231903	·232162	·232420	·232679	·89
·90	·232938	·233197	·233456	·233714	·233973	·234232	·234491	·234750	·235009	·235267	·90
·91	·235526	·235785	·236044	·236303	·236561	·236820	·237079	·237338	·237597	·237856	·91
·92	·238114	·238373	·238632	·238891	·239150	·239409	·239667	·239926	·240185	·240444	·92
·93	·240703	·240961	·241220	·241479	·241738	·241997	·242256	·242514	·242773	·243032	·93
·94	·243291	·243550	·243808	·244067	·244326	·244585	·244844	·245103	·245361	·245620	·94
·95	·245879	·246138	·246397	·246655	·246914	·247173	·247432	·247691	·247950	·248208	·95
·96	·248467	·248726	·248985	·249244	·249502	·249761	·250020	·250279	·250538	·250797	·96
·97	·251055	·251314	·251573	·251832	·252091	·252350	·252608	·252867	·253126	·253385	·97
·98	·253644	·253902	·254161	·254420	·254679	·254938	·255197	·255455	·255714	·255973	·98
·99	·256232	·256491	·256749	·257008	·257267	·257526	·257785	·258044	·258302	·258561	·99
1·00	·258820										1·00

Auxiliary Tables.

Table IX.—Products of $S_3 \times \cdot 001$ up to $S_3 \times 1 \cdot 000$. $S_3 = \sin 45° = \cdot 70711$.

No	·000	·001	·002	·003	·004	·005	·006	·007	·008	·009	No
·00	·000000	·000707	·001414	·002121	·002828	·003536	·004243	·004950	·005657	·006364	·00
·01	·007071	·007778	·008485	·009192	·009900	·010607	·011314	·012021	·012728	·013435	·01
·02	·014142	·014849	·015556	·016264	·016971	·017678	·018385	·019092	·019799	·020506	·02
·03	·021213	·021920	·022628	·023335	·024042	·024749	·025456	·026163	·026870	·027577	·03
·04	·028284	·028992	·029699	·030406	·031113	·031820	·032527	·033234	·033941	·034648	·04
·05	·035356	·036063	·036770	·037477	·038184	·038891	·039598	·040305	·041012	·041719	·05
·06	·042427	·043134	·043841	·044548	·045255	·045962	·046669	·047376	·048083	·048791	·06
·07	·049498	·050205	·050912	·051619	·052326	·053033	·053740	·054447	·055155	·055862	·07
·08	·056569	·057276	·057983	·058690	·059397	·060104	·060811	·061519	·062226	·062933	·08
·09	·063640	·064347	·065054	·065761	·066468	·067175	·067883	·068590	·069297	·070004	·09
·10	·070711	·071418	·072125	·072832	·073539	·074247	·074954	·075661	·076368	·077075	·10
·11	·077782	·078489	·079196	·079903	·080611	·081318	·082025	·082732	·083439	·084146	·11
·12	·084853	·085560	·086267	·086975	·087682	·088389	·089096	·089803	·090510	·091217	·12
·13	·091924	·092631	·093339	·094046	·094753	·095460	·096167	·096874	·097581	·098288	·13
·14	·098995	·099703	·100410	·101117	·101824	·102531	·103238	·103945	·104652	·105359	·14
·15	·106067	·106774	·107481	·108188	·108895	·109602	·110309	·111016	·111723	·112430	·15
·16	·113138	·113845	·114552	·115259	·115966	·116673	·117380	·118087	·118794	·119502	·16
·17	·120209	·120916	·121623	·122330	·123037	·123744	·124451	·125158	·125866	·126573	·17
·18	·127280	·127987	·128694	·129401	·130108	·130815	·131522	·132230	·132937	·133644	·18
·19	·134351	·135058	·135765	·136472	·137179	·137886	·138594	·139301	·140008	·140715	·19
·20	·141422	·142129	·142836	·143543	·144250	·144958	·145665	·146372	·147079	·147786	·20
·21	·148493	·149200	·149907	·150614	·151322	·152029	·152736	·153443	·154150	·154857	·21
·22	·155564	·156271	·156978	·157686	·158393	·159100	·159807	·160514	·161221	·161928	·22
·23	·162635	·163342	·164050	·164757	·165464	·166171	·166878	·167585	·168292	·168999	·23
·24	·169706	·170414	·171121	·171828	·172535	·173242	·173949	·174656	·175363	·176070	·24
·25	·176778	·177485	·178192	·178899	·179606	·180313	·181020	·181727	·182434	·183141	·25
·26	·183849	·184556	·185263	·185970	·186677	·187384	·188091	·188798	·189505	·190213	·26
·27	·190920	·191627	·192334	·193041	·193748	·194455	·195162	·195869	·196577	·197284	·27
·28	·197991	·198698	·199405	·200112	·200819	·201526	·202233	·202941	·203648	·204355	·28
·29	·205062	·205769	·206476	·207183	·207890	·208597	·209305	·210012	·210719	·211426	·29
·30	·212133	·212840	·213547	·214254	·214961	·215669	·216376	·217083	·217790	·218497	·30
·31	·219204	·219911	·220618	·221325	·222033	·222740	·223447	·224154	·224861	·225568	·31
·32	·226275	·226982	·227689	·228397	·229104	·229811	·230518	·231225	·231932	·232639	·32
·33	·233346	·234053	·234761	·235468	·236175	·236882	·237589	·238296	·239003	·239710	·33
·34	·240417	·241125	·241832	·242539	·243246	·243953	·244660	·245367	·246074	·246781	·34
·35	·247489	·248196	·248903	·249610	·250317	·251024	·251731	·252438	·253145	·253852	·35
·36	·254560	·255267	·255974	·256681	·257388	·258095	·258802	·259509	·260216	·260924	·36
·37	·261631	·262338	·263045	·263752	·264459	·265166	·265873	·266580	·267288	·267995	·37
·38	·268702	·269409	·270116	·270823	·271530	·272237	·272944	·273652	·274359	·275066	·38
·39	·275773	·276480	·277187	·277894	·278601	·279308	·280016	·280723	·281430	·282137	·39
·40	·282844	·283551	·284258	·284965	·285672	·286380	·287087	·287794	·288501	·289208	·40
·41	·289915	·290622	·291329	·292036	·292744	·293451	·294158	·294865	·295572	·296279	·41
·42	·296986	·297693	·298400	·299108	·299815	·300522	·301229	·301936	·302643	·303350	·42
·43	·304057	·304764	·305472	·306179	·306886	·307593	·308300	·309007	·309714	·310421	·43
·44	·311128	·311836	·312543	·313250	·313957	·314664	·315371	·316078	·316785	·317492	·44
·45	·318200	·318907	·319614	·320321	·321028	·321735	·322442	·323149	·323856	·324563	·45
·46	·325271	·325978	·326685	·327392	·328099	·328806	·329513	·330220	·330927	·331635	·46
·47	·332342	·333049	·333756	·334463	·335170	·335877	·336584	·337291	·337999	·338706	·47
·48	·339413	·340120	·340827	·341534	·342241	·342948	·343655	·344363	·345070	·345777	·48
·49	·346484	·347191	·347898	·348605	·349312	·350019	·350727	·351434	·352141	·352848	·49
·50	·353555	·354262	·354969	·355676	·356383	·357091	·357798	·358505	·359212	·359919	·50

No.	·000	·001	·002	·003	·004	·005	·006	·007	·008	·009	No.
·50	·353555	·354262	·354969	·355676	·356383	·357091	·357798	·358505	·359212	·359919	·50
·51	·360626	·361333	·362040	·362747	·363455	·364162	·364869	·365576	·366283	·366990	·51
·52	·367697	·368404	·369111	·369819	·370526	·371233	·371940	·372647	·373354	·374061	·52
·53	·374768	·375475	·376183	·376890	·377597	·378304	·379011	·379718	·380425	·381132	·53
·54	·381839	·382547	·383254	·383961	·384668	·385375	·386082	·386789	·387496	·388203	·54
·55	·388911	·389618	·390325	·391032	·391739	·392446	·393153	·393860	·394567	·395274	·55
·56	·395982	·396689	·397396	·398103	·398810	·399517	·400224	·400931	·401638	·402346	·56
·57	·403053	·403760	·404467	·405174	·405881	·406588	·407295	·408002	·408710	·409417	·57
·58	·410124	·410831	·411538	·412245	·412952	·413659	·414366	·415074	·415781	·416488	·58
·59	·417195	·417902	·418609	·419316	·420023	·420730	·421438	·422145	·422852	·423559	·59
·60	·424266	·424973	·425680	·426387	·427094	·427802	·428509	·429216	·429923	·430630	·60
·61	·431337	·432044	·432751	·433458	·434166	·434873	·435580	·436287	·436994	·437701	·61
·62	·438408	·439115	·439822	·440530	·441237	·441944	·442651	·443358	·444065	·444772	·62
·63	·445479	·446186	·446894	·447601	·448308	·449015	·449722	·450429	·451136	·451843	·63
·64	·452550	·453258	·453965	·454672	·455379	·456086	·456793	·457500	·458207	·458914	·64
·65	·459622	·460329	·461036	·461743	·462450	·463157	·463864	·464571	·465278	·465985	·65
·66	·466693	·467400	·468107	·468814	·469521	·470228	·470935	·471642	·472349	·473057	·66
·67	·473764	·474471	·475178	·475885	·476592	·477299	·478006	·478713	·479421	·480128	·67
·68	·480835	·481542	·482249	·482956	·483663	·484370	·485077	·485785	·486492	·487199	·68
·69	·487906	·488613	·489320	·490027	·490734	·491441	·492149	·492856	·493563	·494270	·69
·70	·494977	·495684	·496391	·497098	·497805	·498513	·499220	·499927	·500634	·501341	·70
·71	·502048	·502755	·503462	·504169	·504877	·505584	·506291	·506998	·507705	·508412	·71
·72	·509119	·509826	·510533	·511241	·511948	·512655	·513362	·514069	·514776	·515483	·72
·73	·516190	·516897	·517605	·318312	·519019	·519726	·520433	·521140	·521847	·522554	·73
·74	·523261	·523969	·524676	·525383	·526090	·526797	·527504	·528211	·528918	·529625	·74
·75	·530333	·531040	·531747	·532454	·533161	·533868	·534575	·535282	·535989	·536696	·75
·76	·537404	·538111	·538818	·539525	·540232	·540939	·541646	·542353	·543060	·543768	·76
·77	·544475	·545182	·545889	·546596	·547303	·548010	·548717	·549424	·550132	·550839	·77
·78	·551546	·552253	·552960	·553667	·554374	·555081	·555788	·556496	·557203	·557910	·78
·79	·558617	·559324	·560031	·560738	·561445	·562152	·562860	·563567	·564274	·564981	·79
·80	·565688	·566395	·567102	·567809	·568516	·569224	·569931	·570638	·571345	·572052	·80
·81	·572759	·573466	·574173	·574880	·575588	·576295	·577002	·577709	·578416	·579123	·81
·82	·579830	·580537	·581244	·581952	·582659	·583366	·584073	·584780	·585487	·586194	·82
·83	·586901	·587608	·588316	·589023	·589730	·590437	·591144	·591851	·592558	·593265	·83
·84	·593972	·594680	·595387	·596094	·596801	·597508	·598215	·598922	·599629	·600336	·84
·85	·601044	·601751	·602458	·603165	·603872	·604579	·605286	·605993	·606700	·607407	·85
·86	·608115	·608822	·609529	·610236	·610943	·611650	·612357	·613064	·613771	·614479	·86
·87	·615186	·615893	·616600	·617307	·618014	·618721	·619428	·620135	·620843	·621550	·87
·88	·622257	·622964	·623671	·624378	·625085	·625792	·626499	·627207	·627914	·628621	·88
·89	·629328	·630035	·630742	·631449	·632156	·632863	·633571	·634278	·634985	·635692	·89
·90	·636399	·637106	·637813	·638520	·639227	·639935	·640642	·641349	·642056	·642763	·90
·91	·643470	·644177	·644884	·645591	·646299	·647006	·647713	·648420	·649127	·649834	·91
·92	·650541	·651248	·651955	·652663	·653370	·654077	·654784	·655491	·656198	·656905	·92
·93	·657612	·658319	·659027	·659734	·660441	·661148	·661855	·662562	·663269	·663976	·93
·94	·664683	·665391	·666098	·666805	·667512	·668219	·668926	·669633	·670340	·671047	·94
·95	·671755	·672462	·673169	·673876	·674583	·675290	·675997	·676704	·677411	·678118	·95
·96	·678826	·679533	·680240	·680947	·681654	·682361	·683068	·683775	·684482	·685190	·96
·97	·685897	·686604	·687311	·688018	·688725	·689432	·690139	·690846	·691554	·692261	·97
·98	·692968	·693675	·694382	·695089	·695796	·696503	·697210	·697918	·698625	·699332	·98
·99	·700039	·700746	·701453	·702160	·702867	·703574	·704282	·704989	·705696	·706403	·99
1·00	·707110										1·00

AUXILIARY TABLES.

TABLE X.—Products of $S_4 \times \cdot 001$ up to $S_4 \times 1\cdot 000$. $S_4 = \sin 60° = \cdot 86603$.

No.	·000	·001	·002	·003	·004	·005	·006	·007	·008	·009	No.
·00	·000000	·000866	·001732	·002598	·003464	·004330	·005196	·006062	·006928	·007794	·00
·01	·008660	·009526	·010392	·011258	·012124	·012990	·013856	·014723	·015589	·016455	·01
·02	·017321	·018187	·019053	·019919	·020785	·021651	·022517	·023383	·024249	·025115	·02
·03	·025981	·026847	·027713	·028579	·029445	·030311	·031177	·032043	·032909	·033775	·03
·04	·034641	·035507	·036373	·037239	·038105	·038971	·039837	·040703	·041569	·042435	·04
·05	·043302	·044168	·045034	·045900	·046766	·047632	·048498	·049364	·050230	·051096	·05
·06	·051962	·052828	·053694	·054560	·055426	·056292	·057158	·058024	·058890	·059756	·06
·07	·060622	·061488	·062354	·063220	·064086	·064952	·065818	·066684	·067550	·068416	·07
·08	·069282	·070148	·071014	·071880	·072747	·073613	·074479	·075345	·076211	·077077	·08
·09	·077943	·078809	·079675	·080541	·081407	·082273	·083139	·084005	·084871	·085737	·09
·10	·086603	·087469	·088335	·089201	·090067	·090933	·091799	·092665	·093531	·094397	·10
·11	·095263	·096129	·096995	·097861	·098727	·099593	·100459	·101326	·102192	·103058	·11
·12	·103924	·104790	·105656	·106522	·107388	·108254	·109120	·109986	·110852	·111718	·12
·13	·112584	·113450	·114316	·115182	·116048	·116914	·117780	·118646	·119512	·120378	·13
·14	·121244	·122110	·122976	·123842	·124708	·125574	·126440	·127306	·128172	·129038	·14
·15	·129905	·130771	·131637	·132503	·133369	·134235	·135101	·135967	·136833	·137699	·15
·16	·138565	·139431	·140297	·141163	·142029	·142895	·143761	·144627	·145493	·146359	·16
·17	·147225	·148091	·148957	·149823	·150689	·151555	·152421	·153287	·154153	·155019	·17
·18	·155885	·156751	·157617	·158483	·159350	·160216	·161082	·161948	·162814	·163680	·18
·19	·164546	·165412	·166278	·167144	·168010	·168876	·169742	·170608	·171474	·172340	·19
·20	·173206	·174072	·174938	·175804	·176670	·177536	·178402	·179268	·180134	·181000	·20
·21	·181866	·182732	·183598	·184464	·185330	·186196	·187062	·187929	·188795	·189661	·21
·22	·190527	·191393	·192259	·193125	·193991	·194857	·195723	·196589	·197455	·198321	·22
·23	·199187	·200053	·200919	·201785	·202651	·203517	·204383	·205249	·206115	·206981	·23
·24	·207847	·208713	·209579	·210445	·211311	·212177	·213043	·213909	·214775	·215641	·24
·25	·216508	·217374	·218240	·219106	·219972	·220838	·221704	·222570	·223436	·224302	·25
·26	·225168	·226034	·226900	·227766	·228632	·229498	·230364	·231230	·232096	·232962	·26
·27	·233828	·234694	·235560	·236426	·237292	·238158	·239024	·239890	·240756	·241622	·27
·28	·242488	·243354	·244220	·245086	·245953	·246819	·247685	·248551	·249417	·250283	·28
·29	·251149	·252015	·252881	·253747	·254613	·255479	·256345	·257211	·258077	·258943	·29
·30	·259809	·260675	·261541	·262407	·263273	·264139	·265005	·265871	·266737	·267603	·30
·31	·268469	·269335	·270201	·271067	·271933	·272799	·273665	·274532	·275398	·276264	·31
·32	·277130	·277996	·278862	·279728	·280594	·281460	·282326	·283192	·284058	·284924	·32
·33	·285790	·286656	·287522	·288388	·289254	·290120	·290986	·291852	·292718	·293584	·33
·34	·294450	·295316	·296182	·297048	·297914	·298780	·299646	·300512	·301378	·302244	·34
·35	·303111	·303977	·304843	·305709	·306575	·307441	·308307	·309173	·310039	·310905	·35
·36	·311771	·312637	·313503	·314369	·315235	·316101	·316967	·317833	·318699	·319565	·36
·37	·320431	·321297	·322163	·323029	·323895	·324761	·325627	·326493	·327359	·328225	·37
·38	·329091	·329957	·330823	·331689	·332556	·333422	·334288	·335154	·336020	·336886	·38
·39	·337752	·338618	·339484	·340350	·341216	·342082	·342948	·343814	·344680	·345546	·39
·40	·346412	·347278	·348144	·349010	·349876	·350742	·351608	·352474	·353340	·354206	·40
·41	·355072	·355938	·356804	·357670	·358536	·359402	·360268	·361135	·362001	·362867	·41
·42	·363733	·364599	·365465	·366331	·367197	·368063	·368929	·369795	·370661	·371527	·42
·43	·372393	·373259	·374125	·374991	·375857	·376723	·377589	·378455	·379321	·380187	·43
·44	·381053	·381919	·382785	·383651	·384517	·385383	·386249	·387115	·387981	·388847	·44
·45	·389714	·390580	·391446	·392312	·393178	·394044	·394910	·395776	·396642	·397508	·45
·46	·398374	·399240	·400106	·400972	·401838	·402704	·403570	·404436	·405302	·406168	·46
·47	·407034	·407900	·408766	·409632	·410498	·411364	·412230	·413096	·413962	·414828	·47
·48	·415694	·416560	·417426	·418292	·419159	·420025	·420891	·421757	·422623	·423489	·48
·49	·424355	·425221	·426087	·426953	·427819	·428685	·429551	·430417	·431283	·432149	·49
·50	·433015	·433881	·434747	·435613	·436479	·437345	·438211	·439077	·439943	·440809	·50

No.	·000	·001	·002	·003	·004	·005	·006	·007	·008	·009	No.
·50	·433015	·433881	·434747	·435613	·436479	·437345	·438211	·439077	·439943	·440809	·50
·51	·441675	·442541	·443407	·444273	·445139	·446005	·446871	·447738	·448604	·449470	·51
·52	·450336	·451202	·452068	·452934	·453800	·454666	·455532	·456398	·457264	·458130	·52
·53	·458996	·459862	·460728	·461594	·462460	·463326	·464192	·465058	·465924	·466790	·53
·54	·467656	·468522	·469388	·470254	·471120	·471986	·472852	·473718	·474584	·475450	·54
·55	·476317	·477183	·478049	·478915	·479781	·480647	·481513	·482379	·483245	·484111	·55
·56	·484977	·485843	·486709	·487575	·488441	·489307	·490173	·491039	·491905	·492771	·56
·57	·493637	·494503	·495369	·496235	·497101	·497967	·498833	·499699	·500565	·501431	·57
·58	·502297	·503163	·504029	·504895	·505762	·506628	·507494	·508360	·509226	·510092	·58
·59	·510958	·511824	·512690	·513556	·514422	·515288	·516154	·517020	·517886	·518752	·59
·60	·519618	·520484	·521350	·522216	·523082	·523948	·524814	·525680	·526546	·527412	·60
·61	·528278	·529144	·530010	·530876	·531742	·532608	·533474	·534341	·535207	·536073	·61
·62	·536939	·537805	·538671	·539537	·540403	·541269	·542135	·543001	·543867	·544733	·62
·63	·545599	·546465	·547331	·548197	·549063	·549929	·550795	·551661	·552527	·553393	·63
·64	·554259	·555125	·555991	·556857	·557723	·558589	·559455	·560321	·561187	·562053	·64
·65	·562920	·563786	·564652	·565518	·566384	·567250	·568116	·568982	·569848	·570714	·65
·66	·571580	·572446	·573312	·574178	·575044	·575910	·576776	·577642	·578508	·579374	·66
·67	·580240	·581106	·581972	·582838	·583704	·584570	·585436	·586302	·587168	·588034	·67
·68	·588900	·589766	·590632	·591498	·592365	·593231	·594097	·594963	·595829	·596695	·68
·69	·597561	·598427	·599293	·600159	·601025	·601891	·602757	·603623	·604489	·605355	·69
·70	·606221	·607087	·607953	·608819	·609685	·610551	·611417	·612283	·613149	·614015	·70
·71	·614881	·615747	·616613	·617479	·618345	·619211	·620077	·620944	·621810	·622676	·71
·72	·623542	·624408	·625274	·626140	·627006	·627872	·628738	·629604	·630470	·631336	·72
·73	·632202	·633068	·633934	·634800	·635666	·636532	·637398	·638264	·639130	·639996	·73
·74	·640862	·641728	·642594	·643460	·644326	·645192	·646058	·646924	·647790	·648656	·74
·75	·649523	·650389	·651255	·652121	·652987	·653853	·654719	·655585	·656451	·657317	·75
·76	·658183	·659049	·659915	·660781	·661647	·662513	·663379	·664245	·665111	·665977	·76
·77	·666843	·667709	·668575	·669441	·670307	·671173	·672039	·672905	·673771	·674637	·77
·78	·675503	·676369	·677235	·678101	·678968	·679834	·680700	·681566	·682432	·683298	·78
·79	·684164	·685030	·685896	·686762	·687628	·688494	·689360	·690226	·691092	·691958	·79
·80	·692824	·693690	·694556	·695422	·696288	·697154	·698020	·698886	·699752	·700618	·80
·81	·701484	·702350	·703216	·704082	·704948	·705814	·706680	·707547	·708413	·709279	·81
·82	·710145	·711011	·711877	·712743	·713609	·714475	·715341	·716207	·717073	·717939	·82
·83	·718805	·719671	·720537	·721403	·722269	·723135	·724001	·724867	·725733	·726599	·83
·84	·727465	·728331	·729197	·730063	·730929	·731795	·732661	·733527	·734393	·735259	·84
·85	·736126	·736992	·737858	·738724	·739590	·740456	·741322	·742188	·743054	·743920	·85
·86	·744786	·745652	·746518	·747384	·748250	·749116	·749982	·750848	·751714	·752580	·86
·87	·753446	·754312	·755178	·756044	·756910	·757776	·758642	·759508	·760374	·761240	·87
·88	·762106	·762972	·763838	·764704	·765571	·766437	·767303	·768169	·769035	·769901	·88
·89	·770767	·771633	·772499	·773365	·774231	·775097	·775963	·776829	·777695	·778561	·89
·90	·779427	·780293	·781159	·782025	·782891	·783757	·784623	·785489	·786355	·787221	·90
·91	·788087	·788953	·789819	·790685	·791551	·792417	·793283	·794150	·795016	·795882	·91
·92	·796748	·797614	·798480	·799346	·800212	·801078	·801944	·802810	·803676	·804542	·92
·93	·805408	·806274	·807140	·808006	·808872	·809738	·810604	·811470	·812336	·813202	·93
·94	·814068	·814934	·815800	·816666	·817532	·818398	·819264	·820130	·820996	·821862	·94
·95	·822729	·823595	·824461	·825327	·826193	·827059	·827925	·828791	·829657	·830523	·95
·96	·831389	·832255	·833121	·833987	·834853	·835719	·836585	·837451	·838317	·839183	·96
·97	·840049	·840915	·841781	·842647	·843513	·844379	·845245	·846111	·846977	·847843	·97
·98	·848709	·849575	·850441	·851307	·852174	·853040	·853906	·854772	·855638	·856504	·98
·99	·857370	·858236	·859102	·859968	·860834	·861700	·862566	·863432	·864298	·865164	·99
1·00	·866030										1·00

Auxiliary Tables.

Table XI.—Products of $S_5 \times \cdot 001$ up to $S_5 \times 1 \cdot 000$. $S_5 = \sin 75° = \cdot 96593$.

No.	·000	·001	·002	·003	·004	·005	·006	·007	·008	·009	No.
·00	·000000	·000966	·001932	·002898	·003864	·004830	·005796	·006762	·007727	·008639	·00
·01	·009659	·010625	·011591	·012557	·013523	·014489	·015455	·016421	·017387	·018353	·01
·02	·019319	·020285	·021250	·022216	·023182	·024148	·025114	·026080	·027046	·028012	·02
·03	·028978	·029944	·030910	·031876	·032842	·033808	·034773	·035739	·036705	·037671	·03
·04	·038637	·039603	·040569	·041535	·042501	·043467	·044433	·045399	·046365	·047331	·04
·05	·048297	·049262	·050228	·051194	·052160	·053126	·054092	·055058	·056024	·056990	·05
·06	·057956	·058922	·059888	·060854	·061820	·062785	·063751	·064717	·065683	·066649	·06
·07	·067615	·068581	·069547	·070513	·071479	·072445	·073411	·074377	·075343	·076308	·07
·08	·077274	·078240	·079206	·080172	·081138	·082104	·083070	·084036	·085002	·085968	·08
·09	·086934	·087900	·088866	·089831	·090797	·091763	·092729	·093695	·094661	·095627	·09
·10	·096593	·097559	·098525	·099491	·100457	·101423	·102389	·103355	·104320	·105286	·10
·11	·106252	·107218	·108184	·109150	·110116	·111082	·112048	·113014	·113980	·114946	·11
·12	·115912	·116878	·117843	·118809	·119775	·120741	·121707	·122673	·123639	·124605	·12
·13	·125571	·126537	·127503	·128469	·129435	·130401	·131366	·132332	·133298	·134264	·13
·14	·135230	·136196	·137162	·138128	·139094	·140060	·141026	·141992	·142958	·143924	·14
·15	·144890	·145855	·146821	·147787	·148753	·149719	·150685	·151651	·152617	·153583	·15
·16	·154549	·155515	·156481	·157447	·158413	·159378	·160344	·161310	·162276	·163242	·16
·17	·164208	·165174	·166140	·167106	·168072	·169038	·170004	·170970	·171936	·172901	·17
·18	·173867	·174833	·175799	·176765	·177731	·178697	·179663	·180629	·181595	·182561	·18
·19	·183527	·184493	·185459	·186424	·187390	·188356	·189322	·190288	·191254	·192220	·19
·20	·193186	·194152	·195118	·196084	·197050	·198016	·198982	·199948	·200913	·201879	·20
·21	·202845	·203811	·204777	·205743	·206709	·207675	·208641	·209607	·210573	·211539	·21
·22	·212505	·213471	·214436	·215402	·216368	·217334	·218300	·219266	·220232	·221198	·22
·23	·222164	·223130	·224096	·225062	·226028	·226994	·227959	·228925	·229891	·230857	·23
·24	·231823	·232789	·233755	·234721	·235687	·236653	·237619	·238585	·239551	·240517	·24
·25	·241483	·242448	·243414	·244380	·245346	·246312	·247278	·248244	·249210	·250176	·25
·26	·251142	·252108	·253074	·254040	·255006	·255971	·256937	·257903	·258869	·259835	·26
·27	·260801	·261767	·262733	·263699	·264665	·265631	·266597	·267563	·268529	·269494	·27
·28	·270460	·271426	·272392	·273358	·274324	·275290	·276256	·277222	·278188	·279154	·28
·29	·280120	·281086	·282052	·283017	·283983	·284949	·285915	·286881	·287847	·288813	·29
·30	·289779	·290745	·291711	·292677	·293643	·294609	·295575	·296541	·297506	·298472	·30
·31	·299438	·300404	·301370	·302336	·303302	·304268	·305234	·306200	·307166	·308132	·31
·32	·309098	·310064	·311029	·311995	·312961	·313927	·314893	·315859	·316825	·317791	·32
·33	·318757	·319723	·320689	·321655	·322621	·323587	·324552	·325518	·326484	·327450	·33
·34	·328416	·329382	·330348	·331314	·332280	·333246	·334212	·335178	·336144	·337110	·34
·35	·338076	·339041	·340007	·340973	·341939	·342905	·343871	·344837	·345803	·346769	·35
·36	·347735	·348701	·349667	·350633	·351599	·352564	·353530	·354496	·355462	·356428	·36
·37	·357394	·358360	·359326	·360292	·361258	·362224	·363190	·364156	·365122	·366087	·37
·38	·367053	·368019	·368985	·369951	·370917	·371883	·372849	·373815	·374781	·375747	·38
·39	·376713	·377679	·378645	·379610	·380576	·381542	·382508	·383474	·384440	·385406	·39
·40	·386372	·387338	·388304	·389270	·390236	·391202	·392168	·393134	·394099	·395065	·40
·41	·396031	·396997	·397963	·398929	·399895	·400861	·401827	·402793	·403759	·404725	·41
·42	·405691	·406657	·407622	·408588	·409554	·410520	·411486	·412452	·413418	·414384	·42
·43	·415350	·416316	·417282	·418248	·419214	·420180	·421145	·422111	·423077	·424043	·43
·44	·425009	·425975	·426941	·427907	·428873	·429839	·430805	·431771	·432737	·433703	·44
·45	·434669	·435634	·436600	·437566	·438532	·439498	·440464	·441430	·442396	·443362	·45
·46	·444328	·445294	·446260	·447226	·448192	·449157	·450123	·451089	·452055	·453021	·46
·47	·453987	·454953	·455919	·456885	·457851	·458817	·459783	·460749	·461715	·462680	·47
·48	·463646	·464612	·465578	·466544	·467510	·468476	·469442	·470408	·471374	·472340	·48
·49	·473306	·474272	·475238	·476203	·477169	·478135	·479101	·480067	·481033	·481999	·49
·50	·482965	·483931	·484897	·485863	·486829	·487795	·488761	·489727	·490692	·491658	·50

No.	·000	·001	·002	·003	·004	·005	·006	·007	·008	·009	No.
·50	·482965	·483931	·484897	·485863	·486829	·487795	·488761	·489727	·490692	·491658	·50
·51	·492624	·493590	·494556	·495522	·496488	·497454	·498420	·499386	·500352	·501318	·51
·52	·502284	·503250	·504215	·505181	·506147	·507113	·508079	·509045	·510011	·510977	·52
·53	·511943	·512909	·513875	·514841	·515807	·516773	·517738	·518704	·519670	·520636	·53
·54	·521602	·522568	·523534	·524500	·525466	·526432	·527398	·528364	·529330	·530296	·54
·55	·531262	·532227	·533193	·534159	·535125	·536091	·537057	·538023	·538989	·539955	·55
·56	·540921	·541887	·542853	·543819	·544785	·545750	·546716	·547682	·548648	·549614	·56
·57	·550580	·551546	·552512	·553478	·554444	·555410	·556376	·557342	·558308	·559273	·57
·58	·560239	·561205	·562171	·563137	·564103	·565069	·566035	·567001	·567967	·568933	·58
·59	·569899	·570865	·571831	·572796	·573762	·574728	·575694	·576660	·577626	·578592	·59
·60	·579558	·580524	·581490	·582456	·583422	·584388	·585354	·586320	·587285	·588251	·60
·61	·589217	·590183	·591149	·592115	·593081	·594047	·595013	·595979	·596945	·597911	·61
·62	·598877	·599843	·600808	·601774	·602740	·603706	·604672	·605638	·606604	·607570	·62
·63	·608536	·609502	·610468	·611434	·612400	·613366	·614331	·615297	·616263	·617229	·63
·64	·618195	·619161	·620127	·621093	·622059	·623025	·623991	·624957	·625923	·626889	·64
·65	·627855	·628820	·629786	·630752	·631718	·632684	·633650	·634616	·635582	·636548	·65
·66	·637514	·638480	·639446	·640412	·641378	·642343	·643309	·644275	·645241	·646207	·66
·67	·647173	·648139	·649105	·650071	·651037	·652003	·652969	·653935	·654901	·655866	·67
·68	·656832	·657798	·658764	·659730	·660696	·661662	·662628	·663594	·664560	·665526	·68
·69	·666492	·667458	·668424	·669389	·670355	·671321	·672287	·673253	·674219	·675185	·69
·70	·676151	·677117	·678083	·679049	·680015	·680981	·681947	·682913	·683878	·684844	·70
·71	·685810	·686776	·687742	·688708	·689674	·690640	·691606	·692572	·693538	·694504	·71
·72	·695470	·696436	·697401	·698367	·699333	·700299	·701265	·702231	·703197	·704163	·72
·73	·705129	·706095	·707061	·708027	·708993	·709959	·710924	·711890	·712856	·713822	·73
·74	·714788	·715754	·716720	·717686	·718652	·719618	·720584	·721550	·722516	·723482	·74
·75	·724448	·725413	·726379	·727345	·728311	·729277	·730243	·731209	·732175	·733141	·75
·76	·734107	·735073	·736039	·737005	·737971	·738936	·739902	·740868	·741834	·742800	·76
·77	·743766	·744732	·745698	·746664	·747630	·748596	·749562	·750528	·751494	·752459	·77
·78	·753425	·754391	·755357	·756323	·757289	·758255	·759221	·760187	·761153	·762119	·78
·79	·763085	·764051	·765017	·765982	·766948	·767914	·768880	·769846	·770812	·771778	·79
·80	·772744	·773710	·774676	·775642	·776608	·777574	·778540	·779506	·780471	·781437	·80
·81	·782403	·783369	·784335	·785301	·786267	·787233	·788199	·789165	·790131	·791097	·81
·82	·792063	·793029	·793994	·794960	·795926	·796892	·797858	·798824	·799790	·800756	·82
·83	·801722	·802688	·803654	·804620	·805586	·806552	·807517	·808483	·809449	·810415	·83
·84	·811381	·812347	·813313	·814279	·815245	·816211	·817177	·818143	·819109	·820075	·84
·85	·821041	·822006	·822972	·823938	·824904	·825870	·826836	·827802	·828768	·829734	·85
·86	·830700	·831666	·832632	·833598	·834564	·835529	·836495	·837461	·838427	·839393	·86
·87	·840359	·841325	·842291	·843257	·844223	·845189	·846155	·847121	·848087	·849052	·87
·88	·850018	·850984	·851950	·852916	·853882	·854848	·855814	·856780	·857746	·858712	·88
·89	·859678	·860644	·861610	·862575	·863541	·864507	·865473	·866439	·867405	·868371	·89
·90	·869337	·870303	·871269	·872235	·873201	·874167	·875133	·876099	·877064	·878030	·90
·91	·878996	·879962	·880928	·881894	·882860	·883826	·884792	·885758	·886724	·887690	·91
·92	·888656	·889622	·890587	·891553	·892519	·893485	·894451	·895417	·896383	·897349	·92
·93	·898315	·899281	·900247	·901213	·902179	·903145	·904110	·905076	·906042	·907008	·93
·94	·907974	·908940	·909906	·910872	·911838	·912804	·913770	·914736	·915702	·916668	·94
·95	·917634	·918599	·919565	·920531	·921497	·922463	·923429	·924395	·925361	·926327	·95
·96	·927293	·928259	·929225	·930191	·931157	·932122	·933088	·934054	·935020	·935986	·96
·97	·936952	·937918	·938884	·939850	·940816	·941782	·942748	·943714	·944680	·945645	·97
·98	·946611	·947577	·948543	·949509	·950475	·951441	·952407	·953373	·954339	·955305	·98
·99	·956271	·957237	·958203	·959168	·960134	·961100	·962066	·963032	·963998	·964964	·99
1·00	·965930										1·00

TABLE XII.—Constants for Long-Period Tide Computations.

Motion of O, M, and N for certain periods.

Period.	Motion of O.	Motion of M.	Motion of N.	
For 11½ hours ...	160°·3449	333°·3172	327°·0569	
„ 1 day ...	334·632854	335·618501	322·553510	
„ 100 days ...	343·2854	81·8501	215·351	
„ 200 „ ...	326·5709	163·7002	70·702	
„ 300 „ ...	309·8563	245·5502	286·053	
„ 364 „ ...	126·359002	125·134291	49·47779	
„ 1 day ...	25·367146	24·381499	37·44649	Subtractive in using a 6-figure Arithmometer. See note below.

NOTE.—For O it would be necessary to add 334°·632854, or subtract 25°·367146 for each day's movement. This would only admit of 25°·3671 being used in a 6-figure Arithmometer. Adopting this plan, it is obvious that each daily position would be 0°·000046 too great, and it will be necessary to make an adjustment on this account. The position required is to be correct to three places of decimals of a degree.

Thus, ·000046 would amount to $\left\{\begin{matrix}\cdot 00046 \text{ in } 10 \text{ days} \\ \cdot 00052 \text{ in } 11 \text{ days}\end{matrix}\right\}$ and as ·0005 would affect the third place of decimals, the correction would be applied after 11 days' motion by subtracting ·001 from the third place of decimals shown in the Arithmometer. Similarly, after 33 days' motion ·001 would again have to be subtracted, and so on. The corrections will therefore be ·001 after 11 days' motion, *i.e.* on 12th day, reckoning the starting day; after 33 days, or on 34th day; and after 55, 77, 98, 120, 142, 164, 185, 207, 229, 250, 272, 294, 316, 337, and 359 days' motion.

For M similarly 335°·618501 has to be added, or 24°·381499 to be subtracted, *i.e.* for the 6-figure Arithmometer 24°·3815 is subtracted. This would be ·000001 too much to be subtracted daily, or in 365 days it would amount to ·000365, which will not affect the third place of decimals. No correction is therefore required.

For N, 322°·553510 has to be added, or 37°·446490 to be subtracted. Thus 37°·4465 would be fixed in the Arithmometer. This would be ·00001 too much to subtract daily, and the correction on this account would be arrived at by adding ·001 after 50 days' motion, *i.e.* on 51st day, reckoning the starting day; and after 150, 250, and 350 days' motion, *i.e.* on 151st, 251st, and 351st day.

TABLE XIII.—Natural Numbers to three places of Decimals corresponding to Logarithms with Indices 6, 7, and 8.

Logarithms with Index 6 or $\bar{4}$.

Natural No.	Natural No. to 3 places of Decimals	Logarithms
·00000	·000	·0000000
·00050	·001	·6989700
·00099		·9999999

Logarithms with Index 7 or $\bar{3}$.

Nat. No.	Nat. No. to 3 places of Decimals	Logarithms	Nat. No.	Nat. No. to 3 places of Decimals	Logarithms	Nat. No.	Nat. No. to 3 places of Decimals	Logarithms
·0010	·001	·0000000	·0045	·005	·6532125	·0085	·009	·9294189
·0015	·002	·1760913	·0055	·006	·7403627	·0095	·010	·9777236
·0025	·003	·3979400	·0065	·007	·8129134	·0099		·9999999
·0035	·004	·5440680	·0075	·008	·8750613			
·0045		·6532125	·0085		·9294189			

Logarithms with Index 8 or $\bar{2}$.

Nat. No.	Nat. No. to 3 places of Decimals	Logarithms	Nat. No.	Nat. No. to 3 places of Decimals	Logarithms	Nat. No.	Nat. No. to 3 places of Decimals	Logarithms	Nat. No.	Nat. No. to 3 places of Decimals	Logarithms
·0100	·010	·0000000	·0325	·033	·5118834	·0555	·056	·7442930	·0785	·079	·8948697
·0105	·011	·0211893	·0335	·034	·5250448	·0565	·057	·7520484	·0795	·080	·9003671
·0115	·012	·0606978	·0345	·035	·5378191	·0575	·058	·7596678	·0805	·081	·9057959
·0125	·013	·0969100	·0355	·036	·5502284	·0585	·059	·7671559	·0815	·082	·9111576
·0135	·014	·1303338	·0365	·037	·5622929	·0595	·060	·7745170	·0825	·083	·9164539
·0145	·015	·1613680	·0375	·038	·5740313	·0605	·061	·7817554	·0835	·084	·9216865
·0155	·016	·1903317	·0385	·039	·5854607	·0615	·062	·7888751	·0845	·085	·9268567
·0165	·017	·2174839	·0395	·040	·5965971	·0625	·063	·7958800	·0855	·086	·9319661
·0175	·018	·2430380	·0405	·041	·6074550	·0635	·064	·8027737	·0865	·087	·9370161
·0185	·019	·2671717	·0415	·042	·6180481	·0645	·065	·8095597	·0875	·088	·9420081
·0195	·020	·2900346	·0425	·043	·6283889	·0655	·066	·8162413	·0885	·089	·9469433
·0205	·021	·3117539	·0435	·044	·6384893	·0665	·067	·8228216	·0895	·090	·9518230
·0215	·022	·3324385	·0445	·045	·6483600	·0675	·068	·8293038	·0905	·091	·9566486
·0225	·023	·3521825	·0455	·046	·6580114	·0685	·069	·8356906	·0915	·092	·9614211
·0235	·024	·3710679	·0465	·047	·6674530	·0695	·070	·8419848	·0925	·093	·9661417
·0245	·025	·3891661	·0475	·048	·6766936	·0705	·071	·8481891	·0935	·094	·9708116
·0255	·026	·4065402	·0485	·049	·6857417	·0715	·072	·8543060	·0945	·095	·9754318
·0265	·027	·4232459	·0495	·050	·6946052	·0725	·073	·8603380	·0955	·096	·9800034
·0275	·028	·4393327	·0505	·051	·7032914	·0735	·074	·8662873	·0965	·097	·9845273
·0285	·029	·4548449	·0515	·052	·7118072	·0745	·075	·8721563	·0975	·098	·9890046
·0295	·030	·4698220	·0525	·053	·7201593	·0755	·076	·8779470	·0985	·099	·9934362
·0305	·031	·4842998	·0535	·054	·7283538	·0765	·077	·8836614	·0995	·100	·9978231
·0315	·032	·4983106	·0545	·055	·7363965	·0775	·078	·8893017	·0999		·9999999
·0325		·5118834	·0555		·7442930	·0785		·8948697			

Table XIV.—Values of *N* (Longitude of Moon's Ascending Node) for 0 hour Greenwich Mean Time, January 1.

Value on 0 hour G. M. T., January 1st, 1880 = 285°·956863.
Motion per Julian year in 1880 = 19°·34146248.
Motion for 365 days = 19°·32822387 and for 1 day = 0°·052954.

Year	*N*	Year	*N*	Year	*N*	Year	*N*
1850	146°·174466	1875	22°·650943	1900	259°·127704	1925	135°·604751
1	126·846228	6	3·322717	1	239·799490	6	116·276548
2	107·517991	7	343·941537	2	220·471276	7	96·948346
3	88·136801	8	324·613313	3	201·143062	8	77·620143
4	68·808565	9	305·285087	4	181·814849	9	58·238987
1855	49·480329	1880	285·956863	1905	162·433682	1930	38·910786
6	30·152094	1	266·575685	6	143·105470	1	19·582585
7	10·770905	2	247·247462	7	123·777258	2	0·254384
8	351·442671	3	227·919239	8	104·449046	3	340·873230
9	332·114437	4	208·591017	9	85·067881	4	321·545031
1860	312·786204	1885	189·209841	1910	65·739671	1935	302·216832
1	293·405017	6	169·881619	1	46·411461	6	282·888633
2	274·076784	7	150·553398	2	27·083251	7	263·507481
3	254·748553	8	131·225178	3	7·702088	8	244·179283
4	235·420321	9	111·844004	4	348·373879	9	224·851086
1865	216·039136	1890	92·515784	1915	329·045671	1940	205·522889
6	196·710905	1	73·187565	6	309·717463	1	186·141739
7	177·382675	2	53·859346	7	290·336302	2	166·813543
8	158·054446	3	34·478174	8	271·008095	3	147·485347
9	138·673262	4	15·149956	9	251·679888	4	128·157152
1870	119·345034	1895	355·821739	1920	232·351682	1945	108·776004
1	100·016805	6	336·493522	1	212·970523	6	89·447810
2	80·688577	7	317·112351	2	193·642318	7	70·119616
3	61·307396	8	297·784135	3	174·314113	8	50·791423
4	41·979169	9	278·455920	4	154·985909	9	31·410276

Table XV.—Showing the Decrement of *N* (Longitude of Moon's Ascending Node) since 0 hour January 1 up to Midnight of each Day throughout the Year.

Daily Motion = 0°·0529541.

In Leap Years for all dates after February 28—March 1, use a mean value between the particular day and the day following.

Date	Decre.	Date	Decre.	Date	Decre.	Date	Decre.	Date	Decre.	Date	Decre.
Jan.		Jan.		Jan.		Jan.		Feb.		Feb.	
1- 2	0°·0265	11-12	0°·5560	21-22	1°·0856	31-32	1°·6151	9-10	2°·0917	19-20	2°·6212
2- 3	0·0794	12-13	0·6090	22-23	1·1385	Feb.		10-11	2·1446	20-21	2·6742
3- 4	0·1324	13-14	0·6619	23-24	1·1915	1- 2	1·6681	11-12	2·1976	21-22	2·7271
4- 5	0·1853	14-15	0·7149	24-25	1·2444	2- 3	1·7210	12-13	2·2505	22-23	2·7801
5- 6	0·2383	15-16	0·7678	25-26	1·2974	3- 4	1·7740	13-14	2·3035	23-24	2·8330
6- 7	0·2912	16-17	0·8208	26-27	1·3503	4- 5	1·8269	14-15	2·3565	24-25	2·8860
7- 8	0·3442	17-18	0·8737	27-28	1·4033	5- 6	1·8799	15-16	2·4094	25-26	2·9390
8- 9	0·3972	18-19	0·9267	28-29	1·4562	6- 7	1·9328	16-17	2·4624	26-27	2·9919
9-10	0·4501	19-20	0·9797	29-30	1·5092	7- 8	1·9858	17-18	2·5153	27-28	3·0449
10-11	0·5031	20-21	1·0326	30-31	1·5621	8- 9	2·0387	18-19	2·5683	28-29	3·0978

N.B.—In Table XV. The middle of the year of observations will occur at noon or midnight according as the 29th February is included in the period of observations or not. If the *midnight* falls on a date in a common year, or before the 29th February in a leap year, then the Decrement for *N* as given in the Table is correct: if, however, the *midnight* falls after the 29th February in a leap year, then take the value as that given for the *succeeding date* in the Table.

If the *noon* falls in a common year or before the 29th February in a leap year, the

Table XV.—Showing the Decrement of *N* (Longitude of Moon's Ascending Node) since 0 hour January 1 up to Midnight of each Day throughout the Year—(*Continued*).

Daily Motion = 0°·0529541.

In Leap Years for all dates after February 28—March 1, use a mean value between the particular day and the day following.

Date	Decre.	Date	Decre.	Date	Decre.	Date	Decre.	Date	Decre.	Date	Decre.
Mar.		Apr.		June		Aug.		Sept.		Nov.	
1- 2	3°·1508	22-23	5°·9044	12-13	8°·6050	2- 3	11°·3057	23-24	14°·0593	13-14	16°·7600
2- 3	3·2037	23-24	5·9573	13-14	8·6580	3- 4	11·3587	24-25	14·1123	14-15	16·8129
3- 4	3·2567	24-25	6·0103	14-15	8·7109	4- 5	11·4116	25-26	14·1652	15-16	16·8659
4- 5	3·3096	25-26	6·0632	15-16	8·7639	5- 6	11·4646	26-27	14·2182	16-17	16·9188
5- 6	3·3626	26-27	6·1162	16-17	8·8169	6- 7	11·5175	27-28	14·2711	17-18	16·9718
6- 7	3·4155	27-28	6·1692	17-18	8·8698	7- 8	11·5705	28-29	14·3241	18-19	17·0247
7- 8	3·4685	28-29	6·2221	18-19	8·9228	8- 9	11·6234	29-30	14·3770	19-20	17·0777
8- 9	3·5214	29-30	6·2751	19-20	8·9757	9-10	11·6764	30-31	14·4300	20-21	17·1307
9-10	3·5744	30-31	6·3280	20-21	9·0287	10-11	11·7293	Oct.		21-22	17·1836
10-11	3·6274	May		21-22	9·0816	11-12	11·7823	1- 2	14·4829	22-23	17·2366
11-12	3·6803	1- 2	6·3810	22-23	9·1346	12-13	11·8352	2- 3	14·5359	23-24	17·2895
12-13	3·7333	2- 3	6·4339	23-24	9·1875	13-14	11·8882	3- 4	14·5889	24-25	17·3425
13-14	3·7862	3- 4	6·4869	24-25	9·2405	14-15	11·9411	4- 5	14·6418	25-26	17·3954
14-15	3·8392	4- 5	6·5398	25-26	9·2934	15-16	11·9941	5- 6	14·6948	26-27	17·4484
15-16	3·8921	5- 6	6·5928	26-27	9·3464	16-17	12·0471	6- 7	14·7477	27-28	17·5013
16-17	3·9451	6- 7	6·6457	27-28	9·3994	17-18	12·1000	7- 8	14·8007	28-29	17·5543
17-18	3·9980	7- 8	6·6987	28-29	9·4523	18-19	12·1530	8- 9	14·8536	29-30	17·6072
18-19	4·0510	8- 9	6·7516	29-30	9·5053	19-20	12·2059	9-10	14·9066	30-31	17·6602
19-20	4·1039	9-10	6·8046	30-31	9·5582	20-21	12·2589	10-11	14·9595	Dec.	
20-21	4·1569	10-11	6·8576	July		21-22	12·3118	11-12	15·0125	1- 2	17·7131
21-22	4·2099	11-12	6·9105	1- 2	9·6112	22-23	12·3648	12-13	15·0654	2- 3	17·7661
22-23	4·2628	12-13	6·9635	2- 3	9·6641	23-24	12·4177	13-14	15·1184	3- 4	17·8191
23-24	4·3158	13-14	7·0164	3- 4	9·7171	24-25	12·4707	14-15	15·1713	4- 5	17·8720
24-25	4·3687	14-15	7·0694	4- 5	9·7700	25-26	12·5236	15-16	15·2243	5- 6	17·9250
25-26	4·4217	15-16	7·1223	5- 6	9·8230	26-27	12·5766	16-17	15·2773	6- 7	17·9779
26-27	4·4746	16-17	7·1753	6- 7	9·8759	27-28	12·6296	17-18	15·3302	7- 8	18·0309
27-28	4·5276	17-18	7·2282	7- 8	9·9289	28-29	12·6825	18-19	15·3832	8- 9	18·0838
28-29	4·5805	18-19	7·2812	8- 9	9·9818	29-30	12·7355	19-20	15·4361	9-10	18·1368
29-30	4·6335	19-20	7·3341	9-10	10·0348	30-31	12·7884	20-21	15·4891	10-11	18·1897
30-31	4·6864	20-21	7·3871	10-11	10·0878	31-32	12·8414	21-22	15·5420	11-12	18·2427
31-32	4·7394	21-22	7·4401	11-12	10·1407	Sept.		22-23	15·5950	12-13	18·2956
Apr.		22-23	7·4930	12-13	10·1937	1- 2	12·8943	23-24	15·6479	13-14	18·3486
1- 2	4·7923	23-24	7·5460	13-14	10·2466	2- 3	12·9473	24-25	15·7009	14-15	18·4015
2- 3	4·8453	24-25	7·5989	14-15	10·2996	3- 4	13·0002	25-26	15·7538	15-16	18·4545
3- 4	4·8983	25-26	7·6519	15-16	10·3525	4- 5	13·0532	26-27	15·8068	16-17	18·5075
4- 5	4·9512	26-27	7·7048	16-17	10·4055	5- 6	13·1061	27-28	15·8598	17-18	18·5604
5- 6	5·0042	27-28	7·7578	17-18	10·4584	6- 7	13·1591	28-29	15·9127	18-19	18·6134
6- 7	5·0571	28-29	7·8107	18-19	10·5114	7- 8	13·2120	29-30	15·9657	19-20	18·6663
7- 8	5·1101	29-30	7·8637	19-20	10·5643	8- 9	13·2650	30-31	16·0186	20-21	18·7193
8- 9	5·1630	30-31	7·9166	20-21	10·6173	9-10	13·3180	31-32	16·0716	21-22	18·7722
9-10	5·2160	31-32	7·9696	21-22	10·6703	10-11	13·3709	Nov.		22-23	18·8252
10-11	5·2689	June		22-23	10·7232	11-12	13·4239	1- 2	16·1245	23-24	18·8781
11-12	5·3219	1- 2	8·0225	23-24	10·7762	12-13	13·4768	2- 3	16·1775	24-25	18·9311
12-13	5·3748	2- 3	8·0755	24-25	10·8291	13-14	13·5298	3- 4	16·2304	25-26	18·9840
13-14	5·4278	3- 4	8·1285	25-26	10·8821	14-15	13·5827	4- 5	16·2834	26-27	19·0370
14-15	5·4807	4- 5	8·1814	26-27	10·9350	15-16	13·6357	5- 6	16·3363	27-28	19·0900
15-16	5·5337	5- 6	8·2344	27-28	10·9880	16-17	13·6886	6- 7	16·3893	28-29	19·1429
16-17	5·5867	6- 7	8·2873	28-29	11·0409	17-18	13·7416	7- 8	16·4422	29-30	19·1959
17-18	5·6396	7- 8	8·3403	29-30	11·0939	18-19	13·7945	8- 9	16·4952	30-31	19·2488
18-19	5·6926	8- 9	8·3932	30-31	11·1468	19-20	13·8475	9-10	16·5482	31-32	19·3018
19-20	5·7455	9-10	8·4462	31-32	11·1998	20-21	13·9005	10-11	16·6011		
20-21	5·7985	10-11	8·4991	Aug.		21-22	13·9534	11-12	16·6541		
21-22	5·8514	11-12	8·5521	1- 2	11·2527	22-23	14·0064	12-13	16·7070		

value to be taken from the Table is the mean between the *preceding* and *succeeding* midnights: but if the *noon* falls after the 29th February in a leap year, the mean between the values for the *two midnights immediately following* is to be taken.

AUXILIARY TABLES.

TABLE XVI.—Values of p_1 (Mean Longitude of Solar Perigee) for 0 hour, January 1.

p_1 for 0 hour, January 1, 1880 = 280°·874802.
Motion per Julian year = 0°·01710693.
Motion for 365 days = 0°·01709295.

Year	p_1	Year	p_1	Year	p_1	Year	p_1
	°		°		°		°
1850	280·3614	1875	280·7892	1900	281·2171	1925	281·6450
51	·3785	76	·8063	1	·2342	26	·6621
52	·3956	77	·8235	2	·2513	27	·6792
53	·4125	78	·8406	3	·2684	28	·6963
54	·4299	79	·8577	4	·2855	29	·7135
55	·4470	1880	·8748	5	·3027	1930	·7306
56	·4641	81	·8920	6	·3198	31	·7477
57	·4812	82	·9091	7	·3369	32	·7648
58	·4983	83	·9262	8	·3540	33	·7820
59	·5154	84	·9433	9	·3711	34	·7991
1860	·5325	85	·9604	1910	·3882	35	·8162
61	·5497	86	·9775	11	·4054	36	·8333
62	·5668	87	·9946	12	·4225	37	·8505
63	·5839	88	281·0117	13	·4396	38	·8676
64	·6010	89	·0289	14	·4567	39	·8847
65	·6181	1890	·0460	15	·4738	1940	·9018
66	·6352	91	·0631	16	·4909	41	·9189
67	·6523	92	·0802	17	·5081	42	·9360
68	·6694	93	·0973	18	·5252	43	·9532
69	·6866	94	·1144	19	·5423	44	·9703
1870	·7037	95	·1315	1920	·5594	45	·9874
71	·7208	96	·1486	21	·5766	46	282·0045
72	·7379	97	·1658	22	·5937	47	·0216
73	·7550	98	·1829	23	·6108	48	·0387
74	·7721	99	·2000	24	·6279	49	·0559

TABLE XVII.—Increment of p_1 since 0 hour, January 1, for certain Days of the Year.

Motion for 1 day = 0°·00004683.

Date	Increment	Date	Increment	Date	Increment	Date	Increment
	°		°		°		°
Jan. 10	0·00042	Apr. 10	0·00464	July 9	0·00885	Oct. 7	0·01307
„ 20	·00089	„ 20	·00510	„ 19	·00932	„ 17	·01353
„ 30	·00136	„ 30	·00557	„ 29	·00979	„ 27	·01400
Feb. 9	·00183	May 10	·00604	Aug. 8	·01026	Nov. 6	·01447
„ 19	·00229	„ 20	·00651	„ 18	·01072	„ 16	·01494
Mar. 1	·00276	„ 30	·00698	„ 28	·01119	„ 26	·01541
„ 11	·00323	June 9	·00745	Sept. 7	·01166	Dec. 6	·01588
„ 21	·00370	„ 19	·00791	„ 17	·01213	„ 16	·01634
„ 31	·00417	„ 29	·00838	„ 27	·01260	„ 26	·01681

TABLE XVIII.—Values of I, ν and ξ, corresponding to N.

N	I	ν	ξ	N	N	I	ν	ξ	N	N	I	ν	ξ	N
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
0·0	28·602	0·000	0·000	360·0	30·5	28·005	5·564	5·017	329·5	60·5	26·351	10·131	9·196	299·5
0·5	28·602	0·094	0·084	359·5	31·0	27·985	5·651	5·095	329·0	61·0	26·316	10·194	9·255	299·0
1·0	28·601	0·188	0·169	359·0	31·5	27·965	5·736	5·173	328·5	61·5	26·280	10·256	9·313	298·5
1·5	28·600	0·281	0·253	358·5	32·0	27·945	5·822	5·251	328·0	62·0	26·245	10·318	9·370	298·0
2·0	28·599	0·375	0·337	358·0	32·5	27·925	5·907	5·328	327·5	62·5	26·209	10·379	9·427	297·5
2·5	28·598	0·468	0·421	357·5	33·0	27·904	5·992	5·406	327·0	63·0	26·173	10·440	9·484	297·0
3·0	28·596	0·562	0·506	357·0	33·5	27·884	6·077	5·482	326·5	63·5	26·137	10·500	9·539	296·5
3·5	28·594	0·656	0·590	356·5	34·0	27·862	6·162	5·559	326·0	64·0	26·101	10·560	9·595	296·0
4·0	28·591	0·749	0·674	356·0	34·5	27·841	6·246	5·636	325·5	64·5	26·064	10·619	9·650	295·5
4·5	28·589	0·843	0·758	355·5	35·0	27·819	6·330	5·712	325·0	65·0	26·027	10·677	9·705	295·0
5·0	28·585	0·936	0·842	355·0	35·5	27·797	6·414	5·788	324·5	65·5	25·990	10·735	9·759	294·5
5·5	28·582	1·030	0·926	354·5	36·0	27·775	6·497	5·864	324·0	66·0	25·953	10·793	9·812	294·0
6·0	28·578	1·123	1·010	354·0	36·5	27·752	6·580	5·939	323·5	66·5	25·916	10·849	9·865	293·5
6·5	28·574	1·217	1·094	353·5	37·0	27·729	6·663	6·015	323·0	67·0	25·878	10·906	9·918	293·0
7·0	28·570	1·310	1·178	353·0	37·5	27·706	6·745	6·090	322·5	67·5	25·841	10·961	9·970	292·5
7·5	28·565	1·403	1·262	352·5	38·0	27·682	6·828	6·164	322·0	68·0	25·803	11·016	10·021	292·0
8·0	28·560	1·496	1·346	352·0	38·5	27·658	6·909	6·239	321·5	68·5	25·765	11·070	10·072	291·5
8·5	28·555	1·590	1·430	351·5	39·0	27·634	6·991	6·313	321·0	69·0	25·726	11·124	10·123	291·0
9·0	28·549	1·683	1·514	351·0	39·5	27·610	7·072	6·387	320·5	69·5	25·688	11·177	10·173	290·5
9·5	28·543	1·776	1·598	350·5	40·0	27·585	7·153	6·461	320·0	70·0	25·649	11·230	10·222	290·0
10·0	28·537	1·869	1·681	350·0	40·5	27·560	7·234	6·534	319·5	70·5	25·610	11·282	10·271	289·5
10·5	28·530	1·962	1·765	349·5	41·0	27·535	7·314	6·608	319·0	71·0	25·571	11·333	10·319	289·0
11·0	28·523	2·054	1·848	349·0	41·5	27·510	7·394	6·680	318·5	71·5	25·532	11·383	10·366	288·5
11·5	28·516	2·147	1·932	348·5	42·0	27·484	7·473	6·753	318·0	72·0	25·493	11·433	10·414	288·0
12·0	28·508	2·240	2·015	348·0	42·5	27·458	7·553	6·825	317·5	72·5	25·453	11·482	10·460	287·5
12·5	28·500	2·332	2·099	347·5	43·0	27·432	7·631	6·897	317·0	73·0	25·413	11·531	10·506	287·0
13·0	28·492	2·424	2·182	347·0	43·5	27·405	7·710	6·969	316·5	73·5	25·374	11·579	10·551	286·5
13·5	28·483	2·517	2·265	346·5	44·0	27·378	7·788	7·040	316·0	74·0	25·334	11·626	10·596	286·0
14·0	28·475	2·609	2·348	346·0	44·5	27·351	7·866	7·111	315·5	74·5	25·293	11·673	10·640	285·5
14·5	28·465	2·701	2·431	345·5	45·0	27·324	7·943	7·182	315·0	75·0	25·253	11·719	10·684	285·0
15·0	28·456	2·793	2·514	345·0	45·5	27·296	8·020	7·253	314·5	75·5	25·213	11·764	10·726	284·5
15·5	28·446	2·885	2·596	344·5	46·0	27·268	8·097	7·323	314·0	76·0	25·172	11·809	10·769	284·0
16·0	28·436	2·977	2·679	344·0	46·5	27·240	8·173	7·392	313·5	76·5	25·131	11·852	10·811	283·5
16·5	28·425	3·068	2·762	343·5	47·0	27·212	8·249	7·462	313·0	77·0	25·090	11·895	10·852	283·0
17·0	28·414	3·160	2·844	343·0	47·5	27·183	8·324	7·531	312·5	77·5	25·049	11·938	10·892	282·5
17·5	28·403	3·251	2·927	342·5	48·0	27·154	8·399	7·600	312·0	78·0	25·008	11·980	10·932	282·0
18·0	28·392	3·342	3·009	342·0	48·5	27·125	8·474	7·668	311·5	78·5	24·966	12·021	10·971	281·5
18·5	28·380	3·433	3·091	341·5	49·0	27·095	8·548	7·736	311·0	79·0	24·925	12·061	11·009	281·0
19·0	28·368	3·524	3·173	341·0	49·5	27·066	8·622	7·804	310·5	79·5	24·883	12·100	11·047	280·5
19·5	28·356	3·615	3·255	340·5	50·0	27·036	8·695	7·871	310·0	80·0	24·841	12·139	11·084	280·0
20·0	28·343	3·705	3·337	340·0	50·5	27·006	8·768	7·938	309·5	80·5	24·800	12·177	11·121	279·5
20·5	28·330	3·796	3·418	339·5	51·0	26·975	8·841	8·005	309·0	81·0	24·757	12·214	11·157	279·0
21·0	28·317	3·886	3·500	339·0	51·5	26·944	8·913	8·071	308·5	81·5	24·715	12·251	11·192	278·5
21·5	28·303	3·976	3·581	338·5	52·0	26·913	8·985	8·137	308·0	82·0	24·673	12·287	11·227	278·0
22·0	28·289	4·066	3·662	338·0	52·5	26·882	9·056	8·203	307·5	82·5	24·631	12·322	11·261	277·5
22·5	28·275	4·156	3·743	337·5	53·0	26·851	9·127	8·268	307·0	83·0	24·588	12·356	11·294	277·0
23·0	28·260	4·245	3·824	337·0	53·5	26·819	9·197	8·333	306·5	83·5	24·545	12·389	11·326	276·5
23·5	28·245	4·335	3·905	336·5	54·0	26·787	9·267	8·397	306·0	84·0	24·503	12·422	11·358	276·0
24·0	28·230	4·424	3·985	336·0	54·5	26·755	9·336	8·461	305·5	84·5	24·460	12·454	11·389	275·5
24·5	28·215	4·513	4·066	335·5	55·0	26·723	9·405	8·525	305·0	85·0	24·417	12·485	11·419	275·0
25·0	28·199	4·602	4·146	335·0	55·5	26·690	9·474	8·588	304·5	85·5	24·374	12·515	11·449	274·5
25·5	28·183	4·690	4·226	334·5	56·0	26·657	9·542	8·651	304·0	86·0	24·331	12·545	11·478	274·0
26·0	28·166	4·779	4·306	334·0	56·5	26·624	9·609	8·713	303·5	86·5	24·287	12·573	11·506	273·5
26·5	28·149	4·867	4·386	333·5	57·0	26·591	9·676	8·775	303·0	87·0	24·244	12·601	11·533	273·0
27·0	28·132	4·955	4·466	333·0	57·5	26·557	9·743	8·836	302·5	87·5	24·200	12·628	11·560	272·5
27·5	28·115	5·043	4·545	332·5	58·0	26·523	9·809	8·897	302·0	88·0	24·157	12·654	11·586	272·0
28·0	28·097	5·130	4·624	332·0	58·5	26·489	9·874	8·958	301·5	88·5	24·113	12·680	11·611	271·5
28·5	28·079	5·218	4·703	331·5	59·0	26·455	9·939	9·018	301·0	89·0	24·070	12·704	11·635	271·0
29·0	28·061	5·305	4·782	331·0	59·5	26·421	10·004	9·078	300·5	89·5	24·026	12·728	11·659	270·5
29·5	28·043	5·391	4·861	330·5	60·0	26·386	10·068	9·137	300·0	90·0	23·982	12·751	11·681	270·0
30·0	28·024	5·478	4·939	330·0										

N.B.—I is always positive. When N is between 0° and 180°, ν and ξ are positive; when N is between 180° and 360°, ν and ξ are negative.

AUXILIARY TABLES.

TABLE XVIII.—Values of I, ν and ξ, corresponding to N—(*Continued*).

N	I	ν	ξ	N	N	I	ν	ξ	N	N	I	ν	ξ	N
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
90·5	23·938	12·772	11·704	269·5	120·5	21·283	12·295	11·378	239·5	150·5	19·135	7·745	7·223	209·5
91·0	23·894	12·793	11·725	269·0	121·0	21·241	12·254	11·342	239·0	151·0	19·108	7·635	7·120	209·0
91·5	23·850	12·814	11·745	268·5	121·5	21·199	12·211	11·304	238·5	151·5	19·082	7·523	7·017	208·5
92·0	23·806	12·833	11·765	268·0	122·0	21·157	12·168	11·266	238·0	152·0	19·056	7·411	6·913	208·0
92·5	23·761	12·851	11·784	267·5	122·5	21·115	12·123	11·226	237·5	152·5	19·030	7·298	6·809	207·5
93·0	23·717	12·869	11·802	267·0	123·0	21·073	12·078	11·186	237·0	153·0	19·005	7·184	6·703	207·0
93·5	23·673	12·886	11·819	266·5	123·5	21·032	12·031	11·144	236·5	153·5	18·981	7·069	6·596	206·5
94·0	23·628	12·901	11·835	266·0	124·0	20·990	11·983	11·101	236·0	154·0	18·956	6·953	6·488	206·0
94·5	23·584	12·916	11·851	265·5	124·5	20·949	11·933	11·057	235·5	154·5	18·933	6·836	6·380	205·5
95·0	23·539	12·930	11·866	265·0	125·0	20·908	11·883	11·012	235·0	155·0	18·909	6·718	6·270	205·0
95·5	23·495	12·943	11·880	264·5	125·5	20·867	11·831	10·965	234·5	155·5	18·886	6·599	6·160	204·5
96·0	23·450	12·955	11·893	264·0	126·0	20·826	11·778	10·918	234·0	156·0	18·863	6·480	6·049	224·0
96·5	23·406	12·966	11·905	263·5	126·5	20·786	11·724	10·869	233·5	156·5	18·841	6·359	5·937	203·5
97·0	23·361	12·976	11·916	263·0	127·0	20·746	11·669	10·820	233·0	157·0	18·819	6·238	5·824	203·0
97·5	23·316	12·985	11·927	262·5	127·5	20·705	11·612	10·769	232·5	157·5	18·798	6·116	5·710	202·5
98·0	23·271	12·994	11·936	262·0	128·0	20·666	11·555	10·717	232·0	158·0	18·777	5·993	5·596	202·0
98·5	23·227	13·001	11·945	261·5	128·5	20·626	11·496	10·664	231·5	158·5	18·756	5·869	5·480	201·5
99·0	23·182	13·007	11·953	261·0	129·0	20·586	11·436	10·610	231·0	159·0	18·736	5·744	5·364	201·0
99·5	23·137	13·013	11·960	260·5	129·5	20·547	11·374	10·554	230·5	159·5	18·716	5·618	5·247	200·5
100·0	23·092	13·017	11·966	260·0	130·0	20·508	11·312	10·498	230·0	160·0	18·697	5·492	5·130	200·0
100·5	23·047	13·021	11·971	259·5	130·5	20·469	11·248	10·440	229·5	160·5	18·678	5·365	5·011	199·5
101·0	23·003	13·023	11·975	259·0	131·0	20·430	11·184	10·382	229·0	161·0	18·660	5·237	4·892	199·0
101·5	22·958	13·024	11·979	258·5	131·5	20·392	11·118	10·322	228·5	161·5	18·642	5·109	4·773	198·5
102·0	22·913	13·025	11·981	258·0	132·0	20·353	11·050	10·261	228·0	162·0	18·624	4·980	4·652	198·0
102·5	22·868	13·024	11·983	257·5	132·5	20·315	10·982	10·199	227·5	162·5	18·607	4·850	4·531	197·5
103·0	22·823	13·023	11·983	257·0	133·0	20·278	10·912	10·135	227·0	163·0	18·591	4·719	4·409	197·0
103·5	22·778	13·020	11·983	256·5	133·5	20·240	10·841	10·071	226·5	163·5	18·575	4·588	4·287	196·5
104·0	22·734	13·017	11·982	256·0	134·0	20·203	10·769	10·005	226·0	164·0	18·559	4·456	4·164	196·0
104·5	22·689	13·012	11·979	255·5	134·5	20·166	10·696	9·939	225·5	164·5	18·544	4·323	4·040	195·5
105·0	22·644	13·006	11·976	255·0	135·0	20·129	10·622	9·871	225·0	165·0	18·529	4·190	3·916	195·0
105·5	22·599	13·000	11·972	254·5	135·5	20·092	10·546	9·802	224·5	165·5	18·515	4·056	3·791	194·5
106·0	22·554	12·992	11·967	254·0	136·0	20·056	10·469	9·732	224·0	166·0	18·501	3·922	3·665	194·0
106·5	22·510	12·983	11·961	253·5	136·5	20·020	10·391	9·660	223·5	166·5	18·487	3·787	3·539	193·5
107·0	22·465	12·974	11·954	253·0	137·0	19·984	10·312	9·588	223·0	167·0	18·475	3·651	3·413	193·0
107·5	22·420	12·963	11·946	252·5	137·5	19·949	10·232	9·515	222·5	167·5	18·462	3·515	3·286	192·5
108·0	22·376	12·951	11·937	252·0	138·0	19·913	10·150	9·440	222·0	168·0	18·450	3·379	3·158	192·0
108·5	22·331	12·938	11·927	251·5	138·5	19·878	10·068	9·364	221·5	168·5	18·439	3·242	3·030	191·5
109·0	22·287	12·924	11·916	251·0	139·0	19·844	9·984	9·287	221·0	169·0	18·428	3·104	2·902	191·0
109·5	22·242	12·909	11·904	250·5	139·5	19·809	9·899	9·209	220·5	169·5	18·417	2·966	2·773	190·5
110·0	22·198	12·892	11·891	250·0	140·0	19·775	9·813	9·130	220·0	170·0	18·407	2·828	2·644	190·0
110·5	22·153	12·875	11·877	249·5	140·5	19·742	9·725	9·050	219·5	170·5	18·398	2·689	2·514	189·5
111·0	22·109	12·857	11·862	249·0	141·0	19·708	9·637	8·969	219·0	171·0	18·388	2·550	2·384	189·0
111·5	22·065	12·837	11·846	248·5	141·5	19·675	9·547	8·887	218·5	171·5	18·380	2·410	2·254	188·5
112·0	22·021	12·817	11·829	248·0	142·0	19·642	9·457	8·803	218·0	172·0	18·372	2·270	2·123	188·0
112·5	21·976	12·795	11·811	247·5	142·5	19·610	9·365	8·719	217·5	172·5	18·364	2·130	1·992	187·5
113·0	21·932	12·772	11·792	247·0	143·0	19·577	9·272	8·633	217·0	173·0	18·357	1·989	1·860	187·0
113·5	21·888	12·748	11·772	246·5	143·5	19·545	9·177	8·546	216·5	173·5	18·350	1·848	1·729	186·5
114·0	21·845	12·723	11·750	246·0	144·0	19·514	9·082	8·458	216·0	174·0	18·344	1·707	1·597	186·0
114·5	21·801	12·697	11·728	245·5	144·5	19·483	8·986	8·370	215·5	174·5	18·338	1·566	1·464	185·5
115·0	21·757	12·670	11·705	245·0	145·0	19·452	8·888	8·280	215·0	175·0	18·333	1·424	1·332	185·0
115·5	21·713	12·642	11·681	244·5	145·5	19·421	8·790	8·189	214·5	175·5	18·328	1·282	1·199	184·5
116·0	21·670	12·612	11·655	244·0	146·0	19·391	8·690	8·097	214·0	176·0	18·324	1·140	1·067	184·0
116·5	21·627	12·581	11·629	243·5	146·5	19·361	8·589	8·004	213·5	176·5	18·320	0·998	0·934	183·5
117·0	21·583	12·550	11·601	243·0	147·0	19·332	8·487	7·910	213·0	177·0	18·317	0·856	0·801	183·0
117·5	21·540	12·517	11·572	242·5	147·5	19·302	8·384	7·814	212·5	177·5	18·315	0·713	0·667	182·5
118·0	21·497	12·483	11·543	242·0	148·0	19·273	8·280	7·718	212·0	178·0	18·312	0·571	0·534	182·0
118·5	21·454	12·447	11·512	241·5	148·5	19·245	8·175	7·621	211·5	178·5	18·311	0·428	0·401	181·5
119·0	21·411	12·411	11·480	241·0	149·0	19·217	8·069	7·523	211·0	179·0	18·309	0·286	0·267	181·0
119·5	21·368	12·373	11·447	240·5	149·5	19·189	7·962	7·424	210·5	179·5	18·309	0·143	0·133	180·5
120·0	21·326	12·335	11·413	240·0	150·0	19·162	7·854	7·324	210·0	180·0	18·308	0·000	0·000	180·0

N.B.—I is always positive. When N is between 0° and 180°, ν and ξ are positive; when N is between 180° and 360°, ν and ξ are negative.

TABLE XIX. (1)—Values of $1/f$ and f corresponding to various values of I, to be used in computing H and R for the Tides M_2, N, 2N, ν, MS, 2SM and Luni-Solar fortnightly.

Argument $1/f = \dfrac{\cos^4 \frac{1}{2}\omega \cos^4 \frac{1}{2} i}{\cos^4 \frac{1}{2} I}$.

Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I	Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I
18° 18′ 30″	0·96354		1·03784		23°·5	0·99630		1·00371	
18·4	·96403		·03731		·6	·99703	73	·00298	73
·5	·96458	55	·03672	59	·7	·99775	72	·00225	73
·6	·96513	55	·03613	59	·8	·99849	74	·00152	73
·7	·96569	56	·03553	60	·9	·99922	73	·00078	74
·8	·96624	55	·03494	59	24 ·0	·99996	74	·00004	74
·9	·96680	56	·03434	60	·1	1·00070	74	0·99930	74
19·0	·96736	56	·03374	60	·2	·00145	75	·99855	75
·1	·96793	57	·03313	61	·3	·00220	75	·99781	74
·2	·96850	57	·03252	61	·4	·00296	76	·99705	76
·3	·96908	58	·03191	61	·5	·00372	76	·99629	76
·4	·96965	57	·03129	62	·6	·00448	76	·99553	76
·5	·97023	58	·03068	61	·7	·00525	77	·99478	75
·6	·97082	59	·03006	62	·8	·00601	76	·99402	76
·7	·97141	59	·02943	63	·9	·00679	78	·99326	76
·8	·97199	58	·02882	61	25 ·0	·00757	78	·99249	77
·9	·97259	60	·02819	63	·1	·00835	78	·99172	77
20·0	·97318	59	·02756	63	·2	·00913	78	·99095	77
·1	·97379	61	·02692	64	·3	·00993	80	·99017	78
·2	·97439	60	·02628	64	·4	·01072	79	·98939	78
·3	·97500	61	·02564	64	·5	·01151	79	·98862	77
·4	·97561	61	·02500	64	·6	·01231	80	·98783	79
·5	·97622	61	·02436	64	·7	·01312	81	·98705	78
·6	·97684	62	·02371	65	·8	·01393	81	·98626	79
·7	·97746	62	·02306	65	·9	·01474	81	·98547	79
·8	·97808	62	·02241	65	26 ·0	·01556	82	·98468	79
·9	·97871	63	·02175	66	·1	·01638	82	·98388	80
21·0	·97935	64	·02109	66	·2	·01721	83	·98308	80
·1	·97999	64	·02042	67	·3	·01803	82	·98229	79
·2	·98062	63	·01976	66	·4	·01887	84	·98148	81
·3	·98127	65	·01909	67	·5	·01970	83	·98068	80
·4	·98191	64	·01842	67	·6	·02054	84	·97988	80
·5	·98256	65	·01775	67	·7	·02138	84	·97907	81
·6	·98321	65	·01707	68	·8	·02223	85	·97826	81
·7	·98387	66	·01639	68	·9	·02308	85	·97744	82
·8	·98453	66	·01572	67	27 ·0	·02394	86	·97662	82
·9	·98519	66	·01503	69	·1	·02480	86	·97580	82
22·0	·98586	67	·01434	69	·2	·02566	86	·97498	82
·1	·98653	67	·01365	69	·3	·02653	87	·97416	82
·2	·98721	68	·01296	69	·4	·02740	87	·97333	83
·3	·98788	67	·01226	70	·5	·02828	88	·97250	83
·4	·98857	69	·01157	69	·6	·02916	88	·97167	83
·5	·98925	68	·01087	70	·7	·03005	89	·97083	84
·6	·98994	69	·01016	71	·8	·03093	88	·97000	83
·7	·99063	69	·00945	71	·9	·03183	90	·96916	84
·8	·99133	70	·00875	70	28 ·0	·03272	89	·96832	84
·9	·99203	70	·00803	72	·1	·03363	91	·96747	85
23·0	·99273	70	·00732	71	·2	·03453	90	·96662	85
·1	·99344	71	·00661	71	·3	·03544	91	·96577	85
·2	·99415	71	·00589	72	·4	·03635	91	·96492	85
·3	·99486	71	·00516	73	·5	·03727	92	·96407	85
·4	·99558	72	·00444	72	·6	·03819	92	·96321	86
·5	·99630	72	·00371	73	28° 36′ 6″	·03821		·96320	

Auxiliary Tables.

Argument $1/f = \dfrac{\sin\omega \cos^2 \frac{1}{2}\omega \cos^4 \frac{1}{2} i}{\sin I \cos^2 \frac{1}{2} I}$.

Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I	Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I
18° 18′ 30″	1·24126		0·80563		23°·5	0·99434	361	1·00569	367
18·4	·23563	612	·80932	401	·6	·99073	358	·00936	367
·5	·22951	601	·81333	401	·7	·98715	355	·01303	364
·6	·22350	597	·81734	401	·8	·98360	351	·01667	365
·7	·21753	590	·82135	399	·9	·98009	349	·02032	364
·8	·21163	582	·82534	399	24·0	·97660	344	·02396	362
·9	·20581	578	·82933	398	·1	·97316	342	·02758	363
19·0	·20003	568	·83331	398	·2	·96974	339	·03121	361
·1	·19435	565	·83729	397	·3	·96635	335	·03482	361
·2	·18870	557	·84126	397	·4	·96300	334	·03843	361
·3	·18313	551	·84523	396	·5	·95966	329	·04204	359
·4	·17762	548	·84919	395	·6	·95637	327	·04563	358
·5	·17214	538	·85314	394	·7	·95310	324	·04921	359
·6	·16676	534	·85708	394	·8	·94986	320	·05280	356
·7	·16142	528	·86102	394	·9	·94666	319	·05636	356
·8	·15614	522	·86496	393	25·0	·94347	314	·05992	355
·9	·15092	519	·86889	392	·1	·94033	313	·06347	355
20·0	·14573	509	·87281	391	·2	·93720	310	·06702	353
·1	·14064	507	·87672	390	·3	·93410	307	·07055	353
·2	·13557	501	·88062	391	·4	·93103	305	·07408	353
·3	·13056	495	·88453	389	·5	·92798	301	·07761	351
·4	·12561	492	·88842	389	·6	·92497	299	·08112	351
·5	·12069	484	·89231	388	·7	·92198	296	·08463	349
·6	·11585	480	·89619	387	·8	·91902	294	·08812	349
·7	·11105	476	·90006	387	·9	·91608	292	·09161	349
·8	·10629	470	·90393	386	26·0	·91316	288	·09510	347
·9	·10159	467	·90779	385	·1	·91028	286	·09857	346
21·0	·09692	459	·91164	385	·2	·90742	284	·10203	346
·1	·09233	457	·91549	384	·3	·90458	281	·10549	345
·2	·08776	451	·91933	383	·4	·90177	280	·10894	344
·3	·08325	447	·92316	382	·5	·89897	275	·11238	343
·4	·07878	444	·92698	382	·6	·89622	275	·11581	343
·5	·07434	437	·93080	381	·7	·89347	271	·11924	341
·6	·06997	434	·93461	381	·8	·89076	270	·12265	341
·7	·06563	430	·93842	380	·9	·88806	268	·12606	340
·8	·06133	425	·94222	379	27·0	·88538	265	·12946	339
·9	·05708	422	·94601	378	·1	·88273	263	·13285	338
22·0	·05286	416	·94979	378	·2	·88010	260	·13623	338
·1	·04870	413	·95357	377	·3	·87750	259	·13961	336
·2	·04457	410	·95734	377	·4	·87491	257	·14297	337
·3	·04047	404	·96111	375	·5	·87234	253	·14634	334
·4	·03643	402	·96486	375	·6	·86981	252	·14968	334
·5	·03241	396	·96861	374	·7	·86729	251	·15302	334
·6	·02845	394	·97235	373	·8	·86478	247	·15636	332
·7	·02451	390	·97608	373	·9	·86231	246	·15968	331
·8	·02061	386	·97981	372	28·0	·85985	244	·16299	331
·9	·01675	383	·98353	372	·1	·85741	242	·16630	331
23·0	·01292	377	·98725	370	·2	·85499	239	·16961	328
·1	·00915	376	·99095	369	·3	·85260	238	·17289	328
·2	·00539	372	·99464	370	·4	·85022	237	·17617	328
·3	·00167	368	·99834	368	·5	·84785	234	·17945	327
·4	0·99799	365	1·00202	367	·6	·84551		·18272	
·5	·99434		·00569		28° 36′ 6″	·84547		·18277	

Argument $1/f = \dfrac{\sin\omega \cos\omega (1 - \frac{3}{2}\sin^2 i)}{\sin I \cos I}$.

Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I	Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I
18° 18′ 30″	1·20958		0·82673		23°·5	0·98648	319	1·01371	329
18·4	·20442	560	·83028	388	·6	·98329	316	·01700	328
·5	·19882	550	·83416	385	·7	·98013	313	·02028	327
·6	·19332	547	·83801	385	·8	·97700	309	·02355	325
·7	·18785	539	·84186	384	·9	·97391	308	·02680	325
·8	·18246	532	·84570	383	24·0	·97083	303	·03005	323
·9	·17714	529	·84953	382	·1	·96780	301	·03328	322
19·0	·17185	518	·85335	380	·2	·96479	297	·03650	320
·1	·16667	515	·85715	380	·3	·96182	294	·03970	319
·2	·16152	509	·86095	379	·4	·95888	293	·04289	319
·3	·15643	502	·86474	377	·5	·95595	287	·04608	316
·4	·15141	499	·86851	377	·6	·95308	286	·04924	316
·5	·14642	490	·87228	375	·7	·95022	284	·05240	314
·6	·14152	486	·87603	375	·8	·94738	279	·05554	313
·7	·13666	480	·87978	373	·9	·94459	278	·05867	312
·8	·13186	474	·88351	373	25·0	·94181	274	·06179	310
·9	·12712	472	·88724	371	·1	·93907	272	·06489	309
20·0	·12240	463	·89095	370	·2	·93635	269	·06798	308
·1	·11777	459	·89465	369	·3	·93366	266	·07106	306
·2	·11318	455	·89834	367	·4	·93100	265	·07412	306
·3	·10863	448	·90201	367	·5	·92835	260	·07718	303
·4	·10415	445	·90568	366	·6	·92575	259	·08021	302
·5	·09970	438	·90934	364	·7	·92316	256	·08323	302
·6	·09532	435	·91298	364	·8	·92060	253	·08625	300
·7	·09097	430	·91662	362	·9	·91807	252	·08925	299
·8	·08667	424	·92024	361	26·0	·91555	248	·09224	296
·9	·08243	422	·92385	361	·1	·91307	246	·09520	296
21·0	·07821	414	·92746	359	·2	·91061	243	·09816	295
·1	·07407	412	·93105	358	·3	·90818	241	·10111	293
·2	·06995	406	·93463	356	·4	·90577	240	·10404	292
·3	·06589	402	·93819	356	·5	·90337	236	·10696	290
·4	·06187	400	·94175	355	·6	·90101	234	·10986	290
·5	·05787	392	·94530	353	·7	·89867	232	·11276	287
·6	·05395	391	·94883	352	·8	·89635	229	·11563	286
·7	·05004	385	·95235	351	·9	·89406	228	·11849	286
·8	·04619	381	·95586	349	27·0	·89178	224	·12135	284
·9	·04238	379	·95935	349	·1	·88954	224	·12419	283
22·0	·03859	372	·96284	347	·2	·88730	220	·12702	280
·1	·03487	370	·96631	347	·3	·88510	218	·12982	280
·2	·03117	366	·96978	345	·4	·88292	217	·13262	278
·3	·02751	361	·97323	344	·5	·88075	214	·13540	277
·4	·02390	359	·97667	343	·6	·87861	212	·13817	275
·5	·02031	353	·98010	341	·7	·87649	210	·14092	274
·6	·01678	352	·98351	340	·8	·87439	208	·14366	272
·7	·01326	346	·98691	340	·9	·87231	207	·14638	272
·8	·00980	344	·99031	337	28·0	·87024	203	·14910	269
·9	·00636	341	·99368	337	·1	·86821	202	·15179	269
23·0	·00295	335	·99705	335	·2	·86619	199	·15448	267
·1	0·99960	333	1·00040	335	·3	·86420	198	·15715	265
·2	·99627	329	·00375	333	·4	·86222	197	·15980	265
·3	·99298	326	·00708	332	·5	·86025	194	·16245	264
·4	·98972	324	·01040	331	·6	·85831		·16509	
·5	·98648		·01371		28° 36′ 6″	·85828		·16513	

AUXILIARY TABLES.

TABLE XIX. (4)—Values of $1/f$ and f corresponding to various values of I, to be used in computing H and R for the Tide Mf.

Argument $1/f = \dfrac{\text{Sin}^2 \omega \, \text{Cos}^4 \frac{1}{2} i}{\text{Sin}^2 I}$.

Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I	Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I
18° 18′ 30″	1·59903		0·62538		23°·5	0·99238		1·00768	
18·4	·58377		·63145		·6	·98450	788	·01579	811
·5	·56720	1657	·63808	663	·7	·97667	783	·02392	813
·6	·55107	1613	·64476	668	·8	·96895	772	·03207	815
·7	·53508	1599	·65146	670	·9	·96134	761	·04026	819
·8	·51937	1571	·65820	674	24·0	·95378	756	·04846	820
·9	·50394	1543	·66496	676	·1	·94638	740	·05670	824
19·0	·48865	1529	·67175	679	·2	·93903	735	·06495	825
·1	·47375	1490	·67858	683	·3	·93179	724	·07324	829
·2	·45898	1477	·68544	686	·4	·92463	716	·08155	831
·3	·44448	1450	·69232	688	·5	·91753	710	·08988	833
·4	·43021	1427	·69924	692	·6	·91058	695	·09825	837
·5	·41607	1414	·70618	694	·7	·90367	691	·10663	838
·6	·40229	1378	·71316	698	·8	·89685	682	·11504	841
·7	·38862	1367	·72017	701	·9	·89012	673	·12348	844
·8	·37519	1343	·72720	703	25·0	·88344	668	·13193	845
·9	·36198	1321	·73427	707	·1	·87689	655	·14043	850
20·0	·34888	1310	·74136	709	·2	·87039	650	·14893	850
·1	·33610	1278	·74849	713	·3	·86398	641	·15747	854
·2	·32343	1267	·75564	715	·4	·85764	634	·16603	856
·3	·31096	1247	·76283	719	·5	·85135	629	·17461	858
·4	·29871	1225	·77004	721	·6	·84518	617	·18323	862
·5	·28655	1216	·77727	723	·7	·83904	614	·19186	863
·6	·27468	1187	·78455	728	·8	·83300	604	·20051	865
·7	·26291	1177	·79185	730	·9	·82702	598	·20920	869
·8	·25133	1158	·79919	734	26·0	·82109	593	·21789	869
·9	·23993	1140	·80655	736	·1	·81527	582	·22663	874
21·0	·22862	1131	·81392	737	·2	·80949	578	·23538	875
·1	·21758	1104	·82135	743	·3	·80378	571	·24415	877
·2	·20663	1095	·82879	744	·4	·79814	564	·25296	881
·3	·19584	1079	·83626	747	·5	·79254	560	·26177	881
·4	·18523	1061	·84376	750	·6	·78704	550	·27062	885
·5	·17470	1053	·85128	752	·7	·78158	546	·27948	886
·6	·16441	1029	·85885	757	·8	·77619	539	·28838	890
·7	·15420	1021	·86644	759	·9	·77086	533	·29729	891
·8	·14414	1006	·87405	761	27·0	·76557	529	·30622	893
·9	·13424	990	·88169	764	·1	·76037	520	·31519	897
22·0	·12441	983	·88935	766	·2	·75521	516	·32417	898
·1	·11480	961	·89706	771	·3	·75010	511	·33318	901
·2	·10527	953	·90478	772	·4	·74506	504	·34221	903
·3	·09588	939	·91254	776	·5	·74006	500	·35125	904
·4	·08663	925	·92032	778	·6	·73514	492	·36033	908
·5	·07745	918	·92812	780	·7	·73025	489	·36942	909
·6	·06847	898	·93596	784	·8	·72542	483	·37853	911
·7	·05955	892	·94382	786	·9	·72065	477	·38767	914
·8	·05077	878	·95171	789	28·0	·71591	474	·39683	916
·9	·04211	866	·95963	792	·1	·71125	466	·40602	919
23·0	·03352	859	·96756	793	·2	·70662	463	·41521	919
·1	·02511	841	·97554	798	·3	·70205	457	·42444	923
·2	·01677	834	·98354	800	·4	·69752	453	·43369	925
·3	·00854	823	·99156	802	·5	·69303	449	·44295	926
·4	·00043	811	·99962	806	·6	·68859	444	·45224	929
·5	0·99238	805	1·00768	806	28° 36′ 6″	·68852		·45239	

TABLE XIX. (5)—Values of $1/f$ and f corresponding to various values of I, to be used in computing H and R for the Tide Mm.

Argument $1/f = \dfrac{(1 - \frac{3}{2} \text{Sin}^2 \omega)\,(1 - \frac{3}{2} \text{Sin}^2 i)}{1 - \frac{3}{2} \text{Sin}^2 I}$.

Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I	Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I
18° 18′ 30″	0·88401		1·13121		23°·5	0·98904		1·01108	
18·4	·88550		·12931		·6	·99155	251	·00853	255
·5	·88713	163	·12723	208	·7	·99407	252	·00597	256
·6	·88879	166	·12512	211	·8	·99660	253	·00341	256
·7	·89046	167	·12301	211	·9	·99917	257	·00083	258
·8	·89215	169	·12090	211	24·0	1·00174	257	0·99826	257
·9	·89384	169	·11877	213	·1	·00435	261	·99567	259
19·0	·89554	170	·11665	212	·2	·00697	262	·99308	259
·1	·89727	173	·11450	215	·3	·00962	265	·99048	260
·2	·89900	173	·11234	216	·4	·01229	267	·98786	262
·3	·90076	176	·11018	216	·5	·01498	269	·98524	262
·4	·90252	176	·10800	218	·6	·01770	272	·98261	263
·5	·90430	178	·10582	218	·7	·02044	274	·97998	263
·6	·90611	181	·10362	220	·8	·02319	275	·97734	264
·7	·90792	181	·10142	220	·9	·02598	279	·97469	265
·8	·90974	182	·09922	220	25·0	·02878	280	·97203	266
·9	·91159	185	·09699	223	·1	·03162	284	·96936	267
20·0	·91344	185	·09476	223	·2	·03447	285	·96669	267
·1	·91531	187	·09252	224	·3	·03735	288	·96400	269
·2	·91719	188	·09028	224	·4	·04025	290	·96131	269
·3	·91910	191	·08803	225	·5	·04317	292	·95862	269
·4	·92102	192	·08576	227	·6	·04613	296	·95591	271
·5	·92295	193	·08348	228	·7	·04910	297	·95320	271
·6	·92491	196	·08119	229	·8	·05210	300	·95048	272
·7	·92687	196	·07890	229	·9	·05513	303	·94776	272
·8	·92885	198	·07660	230	26·0	·05818	305	·94502	274
·9	·93085	200	·07429	231	·1	·06127	309	·94227	275
21·0	·93286	201	·07197	232	·2	·06437	310	·93952	275
·1	·93490	204	·06964	233	·3	·06751	314	·93677	275
·2	·93695	205	·06730	234	·4	·07067	316	·93400	277
·3	·93902	207	·06494	236	·5	·07385	318	·93123	277
·4	·94110	208	·06259	235	·6	·07707	322	·92845	278
·5	·94319	209	·06023	236	·7	·08031	324	·92566	279
·6	·94532	213	·05785	238	·8	·08359	328	·92286	280
·7	·94746	214	·05546	239	·9	·08689	330	·92006	280
·8	·94960	214	·05308	238	27·0	·09021	332	·91726	280
·9	·95178	218	·05067	241	·1	·09358	337	·91444	282
22·0	·95397	219	·04825	242	·2	·09696	338	·91162	282
·1	·95618	221	·04583	242	·3	·10037	341	·90878	284
·2	·95840	222	·04341	242	·4	·10382	345	·90594	284
·3	·96064	224	·04098	243	·5	·10729	347	·90310	284
·4	·96290	226	·03853	245	·6	·11081	352	·90025	285
·5	·96518	228	·03608	245	·7	·11434	353	·89739	286
·6	·96748	230	·03362	246	·8	·11791	357	·89453	286
·7	·96980	232	·03115	247	·9	·12152	361	·89165	288
·8	·97214	234	·02866	249	28·0	·12514	362	·88878	287
·9	·97450	236	·02617	249	·1	·12881	367	·88589	289
23·0	·97687	237	·02368	249	·2	·13250	369	·88300	289
·1	·97926	239	·02118	250	·3	·13624	374	·88011	289
·2	·98167	241	·01867	251	·4	·14000	376	·87720	291
·3	·98412	245	·01614	253	·5	·14378	378	·87429	291
·4	·98657	245	·01361	253	·6	·14763	385	·87137	292
·5	·98904	247	·01108	253	28° 36′ 6″	·14769		·87132	

AUXILIARY TABLES.

TABLE XIX. (6)—Values of $1/f$ and f corresponding to various values of I, to be used in computing H and R for the Tide K_1.

Argument $1/f = \dfrac{1 \cdot 46407 \times k_1}{\left\{1+(0 \cdot 46407 \times k_1)^2 + 0 \cdot 92814\, k_1 \operatorname{Cos} \nu\right\}^{\frac{1}{2}}}$ where $k_1 = \dfrac{\operatorname{Sin}\omega \operatorname{Cos}\omega (1-\frac{3}{2}\operatorname{Sin}^2 i)}{\operatorname{Sin} I \operatorname{Cos} I}$.

Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I	Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I
18° 18′ 30″	1·13424		0·88165		23°·5	0·99619		1·00383	
18·4	·13142		·88385		·6	·99395	224	·00609	226
·5	·12835	307	·88625	240	·7	·99172	223	·00835	226
·6	·12532	303	·88863	238	·8	·98950	222	·01062	227
·7	·12229	303	·89103	240	·9	·98730	220	·01286	224
·8	·11927	302	·89344	241	24·0	·98510	220	·01512	226
·9	·11628	299	·89583	239	·1	·98293	217	·01737	225
19·0	·11329	299	·89824	241	·2	·98076	217	·01962	225
·1	·11035	294	·90061	237	·3	·97862	214	·02184	222
·2	·10740	295	·90301	240	·4	·97649	213	·02408	224
·3	·10448	292	·90540	239	·5	·97435	214	·02632	224
·4	·10158	290	·90779	239	·6	·97227	208	·02853	221
·5	·09867	291	·91019	240	·7	·97017	210	·03075	222
·6	·09580	287	·91257	238	·8	·96808	209	·03297	222
·7	·09294	286	·91496	239	·9	·96602	206	·03517	220
·8	·09011	283	·91734	238	25·0	·96396	206	·03738	221
·9	·08729	282	·91972	238	·1	·96194	202	·03957	219
20·0	·08446	283	·92212	240	·2	·95991	203	·04177	220
·1	·08168	278	·92449	237	·3	·95790	201	·04395	218
·2	·07889	279	·92688	239	·4	·95590	200	·04613	218
·3	·07614	275	·92925	237	·5	·95391	199	·04832	219
·4	·07340	274	·93162	237	·6	·95195	196	·05048	216
·5	·07067	273	·93400	238	·7	·94999	196	·05265	217
·6	·06796	271	·93637	237	·8	·94804	195	·05480	215
·7	·06527	269	·93873	236	·9	·94612	192	·05695	215
·8	·06258	269	·94111	238	26·0	·94419	193	·05911	216
·9	·05993	265	·94346	235	·1	·94228	191	·06126	215
21·0	·05727	266	·94583	237	·2	·94039	189	·06339	213
·1	·05465	262	·94818	235	·3	·93852	187	·06550	211
·2	·05203	262	·95054	236	·4	·93666	186	·06763	213
·3	·04944	259	·95289	235	·5	·93479	187	·06976	213
·4	·04687	257	·95523	234	·6	·93295	184	·07187	211
·5	·04429	258	·95759	236	·7	·93112	183	·07397	210
·6	·04175	254	·95993	234	·8	·92930	182	·07608	211
·7	·03919	256	·96228	235	·9	·92750	180	·07817	209
·8	·03669	250	·96461	233	27·0	·92570	180	·08026	209
·9	·03419	250	·96694	233	·1	·92393	177	·08233	207
22·0	·03168	251	·96929	235	·2	·92215	178	·08442	209
·1	·02922	246	·97161	232	·3	·92042	173	·08647	205
·2	·02677	245	·97393	232	·4	·91867	175	·08853	206
·3	·02431	246	·97626	233	·5	·91693	174	·09059	206
·4	·02189	242	·97858	232	·6	·91521	172	·09264	205
·5	·01948	241	·98089	231	·7	·91351	170	·09468	204
·6	·01710	238	·98319	230	·8	·91181	170	·09672	204
·7	·01471	239	·98550	231	·9	·91013	168	·09874	202
·8	·01234	237	·98781	231	28·0	·90846	167	·10077	203
·9	·00999	235	·99011	230	·1	·90680	166	·10278	201
23·0	·00764	235	·99241	230	·2	·90515	165	·10479	201
·1	·00534	230	·99469	228	·3	·90353	162	·10677	198
·2	·00303	231	·99698	229	·4	·90190	163	·10877	200
·3	·00075	228	·99926	228	·5	·90028	162	·11077	200
·4	0·99846	229	1·00154	228	·6	·89868	160	·11275	198
·5	·99619	227	·00383	229	28° 36′ 6″	·89865		·11279	

TABLE XIX. (7)—Values of $1/f$ and f corresponding to various values of I, to be used in computing H and R for the Tide K_2.

Argument $1/f = \dfrac{1 \cdot 46407 \times k_2}{\left\{1+(0 \cdot 46407 \times k_2)^2 + 0 \cdot 92814\, k_2 \operatorname{Cos} 2\nu\right\}^{\frac{1}{2}}}$ where $k_2 = \dfrac{\operatorname{Sin}^2 \omega\, (1-\frac{3}{2}\operatorname{Sin}^2 i)}{\operatorname{Sin}^2 I}$.

Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I	Values of I	$1/f$	Differences for 0°·1 of I	f	Differences for 0°·1 of I
18° 18′ 30″	1·33764		0·74759		23°·5	1·01137		0·98876	
18·4	·33173		·75090		·6	·00566	571	·99437	561
·5	·32518	655	·75462	372	·7	0·99996	570	1·00004	567
·6	·31871	647	·75832	370	·8	·99429	567	·00574	570
·7	·31218	653	·76209	377	·9	·98865	564	·01148	574
·8	·30564	654	·76591	382	24·0	·98304	561	·01725	577
·9	·29915	649	·76974	383	·1	·97748	556	·02303	578
19·0	·29257	658	·77365	391	·2	·97194	554	·02887	584
·1	·28608	649	·77756	391	·3	·96643	551	·03474	587
·2	·27953	655	·78154	398	·4	·96095	548	·04064	590
·3	·27301	652	·78554	400	·5	·95548	547	·04659	595
·4	·26650	651	·78958	404	·6	·95008	540	·05254	595
·5	·25993	657	·79369	411	·7	·94469	539	·05855	601
·6	·25345	648	·79780	411	·8	·93932	537	·06459	604
·7	·24693	652	·80197	417	·9	·93401	531	·07065	606
·8	·24042	651	·80618	421	25·0	·92871	530	·07677	612
·9	·23394	648	·81041	423	·1	·92347	524	·08287	610
20·0	·22740	654	·81473	432	·2	·91823	524	·08905	618
·1	·22096	644	·81903	430	·3	·91303	520	·09526	621
·2	·21448	648	·82340	437	·4	·90788	515	·10147	621
·3	·20800	648	·82782	442	·5	·90273	515	·10775	628
·4	·20157	643	·83224	442	·6	·89765	508	·11403	628
·5	·19510	647	·83675	451	·7	·89257	508	·12036	633
·6	·18872	638	·84124	449	·8	·88754	503	·12671	635
·7	·18228	644	·84582	458	·9	·88254	500	·13309	638
·8	·17590	638	·85042	460	26·0	·87755	499	·13954	645
·9	·16952	638	·85505	463	·1	·87263	492	·14596	642
21·0	·16313	639	·85975	470	·2	·86772	491	·15245	649
·1	·15682	631	·86444	469	·3	·86284	488	·15896	651
·2	·15049	633	·86919	475	·4	·85801	483	·16549	653
·3	·14418	631	·87399	480	·5	·85317	484	·17210	661
·4	·13790	628	·87881	482	·6	·84842	475	·17867	657
·5	·13161	629	·88370	489	·7	·84366	476	·18531	664
·6	·12539	622	·88858	488	·8	·83893	473	·19200	669
·7	·11915	624	·89354	496	·9	·83425	468	·19868	668
·8	·11296	619	·89851	497	27·0	·82959	466	·20542	674
·9	·10678	618	·90352	501	·1	·82499	460	·21214	672
22·0	·10060	618	·90860	508	·2	·82039	460	·21894	680
·1	·09449	611	·91366	506	·3	·81583	456	·22575	681
·2	·08838	611	·91880	514	·4	·81131	452	·23258	683
·3	·08230	608	·92396	516	·5	·80679	452	·23948	690
·4	·07624	606	·92916	520	·6	·80234	445	·24636	688
·5	·07019	605	·93442	526	·7	·79789	445	·25330	694
·6	·06421	598	·93966	524	·8	·79351	438	·26023	693
·7	·05823	598	·94498	532	·9	·78912	439	·26723	700
·8	·05226	597	·95033	535	28·0	·78477	435	·27425	702
·9	·04635	591	·95570	537	·1	·78048	429	·28127	702
23·0	·04043	592	·96114	544	·2	·77619	429	·28834	707
·1	·03457	586	·96658	544	·3	·77193	426	·29546	712
·2	·02873	584	·97207	549	·4	·76772	421	·30257	711
·3	·02292	581	·97759	552	·5	·76351	421	·30974	717
·4	·01714	578	·98315	556	·6	·75934	417	·31693	719
·5	·01137	577	·98876	561	28° 36′ 6″	·75928		·31703	

Auxiliary Tables.

Table XX.—Values of ν' corresponding to I, to determine initial argument of Tide K_1.

$$\tan \nu' = \frac{\sin \nu}{\cos \nu + 0\cdot46407 \times k_1} \quad \text{where } k_1 = \frac{\sin \omega \cos \omega \,(1 - \frac{3}{2}\sin^2 i)}{\sin I \cos I}.$$

I	ν′	Differences for 0°·1 of I	I	ν′	Differences for 0°·1 of I	I	ν′	Differences for 0°·1 of I	I	ν′	Differences for 0°·1 of I	I	ν′	Differences for 0°·1 of I
° ′ ″	°	°	°	°	°	°	°	°	°	°	°	°	°	°
18 18 30	0·000		20·4	7·363	0·124	22·5	8·819	0·021	24·6	8·567	0·049	26·7	6·672	0·145
18·4	1·557	0·958	·5	7·487	·112	·6	8·840	·019	·7	8·518	·053	·8	6·527	·155
·5	2·515	·534	·6	7·599	·109	·7	8·859	·016	·8	8·465	·057	·9	6·372	·158
·6	3·049	·491	·7	7·708	·103	·8	8·875	·011	·9	8·408	·059	27·0	6·214	·172
·7	3·540	·406	·8	7·811	·096	·9	8·886	·010	25·0	8·349	·065	·1	6·042	·177
·8	3·946	·358	·9	7·907	·093	23·0	8·896	·004	·1	8·284	·068	·2	5·865	·187
·9	4·304	·334	21·0	8·000	·085	·1	8·900	·001	·2	8·216	·071	·3	5·678	·200
19·0	4·638	·286	·1	8·085	·081	·2	8·901	·001	·3	8·145	·076	·4	5·478	·206
·1	4·924	·274	·2	8·166	·077	·3	8·900	·006	·4	8·069	·078	·5	5·272	·228
·2	5·198	·251	·3	8·243	·070	·4	8·894	·008	·5	7·991	·085	·6	5·044	·237
·3	5·449	·231	·4	8·313	·068	·5	8·886	·013	·6	7·906	·088	·7	4·807	·256
·4	5·680	·323	·5	8·381	·061	·6	8·873	·015	·7	7·818	·092	·8	4·551	·280
·5	5·903	·199	·6	8·442	·059	·7	8·858	·019	·8	7·726	·097	·9	4·271	·292
·6	6·102	·193	·7	8·501	·053	·8	8·839	·022	·9	7·629	·100	28·0	3·979	·344
·7	6·295	·180	·8	8·554	·049	·9	8·817	·025	26·0	7·529	·107	·1	3·635	·372
·8	6·475	·169	·9	8·603	·047	24·0	8·792	·029	·1	7·423	·111	·2	3·263	·427
·9	6·644	·163	22·0	8·650	·040	·1	8·763	·032	·2	7·311	·116	·3	2·836	·553
20·0	6·807	·149	·1	8·690	·038	·2	8·731	·036	·3	7·195	·123	·4	2·283	·614
·1	6·956	·144	·2	8·728	·034	·3	8·695	·040	·4	7·072	·125	·5	1·669	1·642
·2	7·100	·136	·3	8·762	·029	·4	8·655	·041	·5	6·947	·136	·6	0·027	
·3	7·236	·127	·4	8·791	·028	·5	8·614	·047	·6	6·811	·139	28 36 6	·000	
·4	7·363		·5	8·819		·6	8·567		·7	6·672				

N.B.—In the above table ν' is positive when N is between 0° and 180°, and negative when N is between 180° and 360°; thus it is necessary to observe what is the value of N, because I is always positive.

Table XXI.—Values of $2\nu''$ corresponding to I, to determine initial argument of Tide K_2.

$$\tan 2\nu'' = \frac{\sin 2\nu}{\cos 2\nu + 0\cdot46407 \times k_2} \quad \text{where } k_2 = \frac{\sin^2 \omega \,(1 - \frac{3}{2}\sin^2 i)}{\sin^2 I}.$$

I	2ν″	Differences for 0°·1 of I	I	2ν″	Differences for 0°·1 of I	I	2ν″	Differences for 0°·1 of I	I	2ν″	Differences for 0°·1 of I	I	2ν″	Differences for 0°·1 of I
° ′ ″	°	°	°	°	°	°	°	°	°	°	°	°	°	°
18 18 30	0·000		20·4	13·963	0·265	22·5	17·422	0·072	24·6	17·463	0·078	26·7	13·931	0·291
18·4	2·810	1·738	·5	14·228	·246	·6	17·494	·068	·7	17·385	·086	·8	13·640	·309
·5	4·548	0·983	·6	14·474	·240	·7	17·562	·059	·8	17·299	·095	·9	13·331	·319
·6	5·531	·907	·7	14·714	·227	·8	17·621	·052	·9	17·204	·099	27·0	13·012	·348
·7	6·438	·758	·8	14·941	·216	·9	17·673	·047	25·0	17·105	·113	·1	12·664	·359
·8	7·196	·674	·9	15·157	·210	23·0	17·720	·035	·1	16·992	·117	·2	12·305	·383
·9	7·870	·632	21·0	15·367	·194	·1	17·755	·032	·2	16·875	·128	·3	11·922	·409
19·0	8·502	·549	·1	15·561	·189	·2	17·787	·023	·3	16·747	·136	·4	11·513	·423
·1	9·051	·528	·2	15·750	·179	·3	17·810	·016	·4	16·611	·142	·5	11·090	·470
·2	9·579	·488	·3	15·929	·168	·4	17·826	·012	·5	16·469	·157	·6	10·620	·491
·3	10·067	·454	·4	16·097	·164	·5	17·838	·000	·6	16·312	·162	·7	10·129	·529
·4	10·521	·438	·5	16·261	·149	·6	17·838	·004	·7	16·150	·172	·8	9·600	·583
·5	10·959	·399	·6	16·410	·145	·7	17·834	·012	·8	15·978	·184	·9	9·017	·609
·6	11·358	·388	·7	16·555	·136	·8	17·822	·020	·9	15·794	·189	28·0	8·408	·720
·7	11·746	·364	·8	16·691	·126	·9	17·802	·024	26·0	15·605	·207	·1	7·688	·780
·8	12·110	·346	·9	16·817	·122	24·0	17·778	·036	·1	15·398	·213	·2	6·908	·901
·9	12·456	·336	22·0	16·939	·109	·1	17·742	·040	·2	15·185	·226	·3	6·007	1·166
20·0	12·792	·310	·1	17·048	·105	·2	17·702	·049	·3	14·959	·239	·4	4·841	1·300
·1	13·102	·303	·2	17·153	·097	·3	17·653	·056	·4	14·720	·245	·5	3·541	3·483
·2	13·405	·286	·3	17·250	·088	·4	17·597	·061	·5	14·475	·268	·6	0·058	
·3	13·691	·272	·4	17·338	·084	·5	17·536	·073	·6	14·207	·276	28 36 6	·000	
·4	13·963		·5	17·422		·6	17·463		·7	13·931				

N.B.—In the above table $2\nu''$ is positive when N is between 0° and 180°, and negative when N is between 180° and 360°; thus it is necessary to observe what is the value of N, because I is always positive.

CHAPTER VIII.

TIDAL PREDICTION.

1.

Harmonic Tide-predicting Machine.

The harmonic tide-predicting machine is an instrument designed for the purpose of doing away with the great mass of computations which would be necessary to obtain the heights and times of high and low waters for each day in the year as published in the *Tide-tables for the Indian Ports.* The height of the tide at any instant being the sum of the ordinates of a considerable number of harmonic curves representing the various simple tides, it would be necessary to compute each of these ordinates for several hours each day about the times of high and low waters and add the results together: the machine makes the computations and the addition automatically and exhibits the result in the form of a curve from which the heights and times can at once be read off.

The machine under consideration was constructed for the Government of India for the prediction of the tides of India and the adjacent coasts, but owing to the delicacy of its mechanism it was deemed advisable not to expose it to the risks of transit to India, and it was therefore erected at the observatory of the India Stores Department, London.

The tidal constants or components used on the machine are those determined in the Office of the Tidal and Levelling Party at Poona from the records obtained from automatic self-registering tide-gauges in operation at the different ports. These constants are regularly transmitted to Mr. Roberts under whose direction the tidal predictions contained in the tide-tables are produced.

In the original design of 1879, the number of tidal components combined by the machine was twenty, *viz.*:—

	Numbered on Machine.
The mean lunar semi-diurnal tide, M_2	1
The mean solar semi-diurnal tide, S_2	2
Two lunar *elliptic* semi-diurnal *tides*, N and L	5 and 10
Two lunar "evectional" semi-diurnal tides, ν and λ	9 " 11
One lunar "variational" semi-diurnal tide, μ	8
One lunar declinational diurnal tide, O	4
One solar declinational diurnal tide, P	6
One luni-solar declinational diurnal tide, K_1	3
One luni-solar declinational semi-diurnal tide, K_2	7
Two lunar declinational elliptic diurnal tides, J and Q	13 and 12
One compound luni-solar quarter-diurnal tide, MS	14
One compound luni-solar semi-diurnal tide, 2SM	15
One mean solar diurnal tide, S_1	20
Two mean lunar "over-tides" of the semi-diurnal tide, M_4 and M_6 ...	18 and 19
One solar annual elliptic tide, η or Sa	16
One solar semi-annual declinational tide, 2η or Ssa	17

In the spring of 1891 one new semi-diurnal and three new "compound" components were added to the machine and the larger solar elliptic semi-diurnal component (T) substituted in the place of the smaller "evectional" semi-diurnal tide (λ) which is of small value.

The new components are as follow:—

	Numbered on Machine.
One second-order lunar elliptic semi-diurnal tide, 2N	21
One compound lunar quarter-diurnal tide, M_2N	22
Two compound lunar ter-diurnal tides, $2M_2K_1$ and M_2K_1	23 and 24
One larger solar elliptic semi-diurnal tide, T	11

These additions and the substitution raise the number of components now on the machine to twenty-four.

The machine, a front and a side view of which are given in Plate IX, consists of a plate of gun-metal of oval form measuring about 3 feet 8 inches wide by 3 feet deep, supported on two standards. Upon this plate, which supports the crank-axes of the different movements, are fitted all the guide pillars and bars of the parallel slides, hereafter described. At the back of the plate, and distant from it some 6 inches, are bolted two skeleton plates, *P*, (see Fig. 2, Plate IX and Fig. 1, Plate X) carrying the other ends of the crank-axes, which are provided with pointers, *a*, (see Plate X) for setting, and also with dials, *b*, divided into degrees, or to 360ths of the period of the tidal components. Between the plates are a horizontal centre main shaft, *c*, (see Plates IX and X) and four oblique shafts, *d*, (see Plate X) turning in the same time, the oblique shafts being driven through the main shaft, two from each end. The main shaft receives its motion from clock-work driving gear at the bottom of the machine through the approximately vertical shafts, *e*, (see Plates IX and X) pinned together. Rivetted to the oblique shafts and the main driving shaft are the bevel wheels, *f*, (see Fig. 1, Plate X) which are geared with other bevel wheels, *g*, provided on their axes with endless screws, *h*, working into wheels, *i*, (see Figs. 1 and 2, Plate X) on the crank-axes of the several components. The clock-work driving gear also gives motion to the centre recording barrel, *j*, (see Fig. 3, Plate X) and through it to the receiving drum-barrel, *y*. The tracing point moves vertically up and down in the frame immediately in front of the recording barrel.

Perhaps the chief difficulty in the construction of the machine is the finding, within reasonable limits, of proportions which represent with sufficient accuracy the periods of the respective tidal components, in order that the machine may be used for a considerable period of prediction—say for twelve months' tides. Very great success has been attained in this respect in the present instrument. For instance, the error of the period of the chief component—the mean lunar semi-diurnal—relatively to the mean solar semi-diurnal, is inappreciable during a whole year's predictions, amounting to about 0·10 degree only in a period of fifty years. The greatest deviation from strict accuracy is 0·37 degree after a run representing twelve months. This is, however, one of the smaller components, and insensible in its effect. This part of the design may therefore be regarded as practically perfect.

A crank, *k*, (see Plate X, Fig. 2, and Plate XI), is fitted to the axis, *l*, of each component. A sliding piece, carrying a steel guiding pin, *m*, for setting, is fitted in each crank. The guiding pin is thrown out from the centre of the crank-axis by means of a fine cut screw of half millimetre pitch, and micrometer head, *n*. The requisite distance of the throw of the guiding pin is previously determined by the proper analysis of the tidal observations of the port for which the predictions are required. It may be here remarked that a year's tidal observations will yield fairly good constants, but a longer period of observations is very desirable, the general limit of the smaller Indian ports being five years, whilst at the more important ports the registration of tidal observations is continuous. A horizontal cross-head, *o*, (see Plate XI) carries at its centre a very light and well-balanced pulley, *p*, (see Plate X, Fig. 2, and Plate XI). The cross-head is fitted at one end with an adjustable steel rod guide, *q*, moving freely in two pillar guides, *G*, (see Plate XI), drilled out nearly their entire length to reduce the touching parts to a minimum. The opposite end of the cross-head carries a projecting fork guide, which travels with freedom on either side of a narrow, flat brass bar guide, *r*, supported on pillars. The steel rod guide, *q*, of the cross-head is balanced by an adjustable sliding weight, *W*, fitted in continuation of the projecting fork guide, so that the centre of gravity of the cross-head and guide is in a vertical through the centre of the axis of the pulley. [The cross-head thus balanced is counterpoised by a cord and weight passing over pulleys at some distance above it, in a vertical through its centre of gravity and the axis of the pulley as shewn in Fig. 1, Plate IX]. At the back of the cross-head are fitted two parallel steel jaws, *s*, (see Plate X, Fig. 2, and Plate XI), the lower one adjustable, in order that the distance between them can be regulated. Both the brass bar guide, *r*, and the steel rod guide, *q*, are divided to millimetres; the brass bar guide for approximate and the steel rod guide for the accurate adjustment of the throw of the crank-pin, for which purpose the upper pillar guide of the steel rod guide is furnished with a vernier. The flat brass bar guide is movable through a small range for perfect adjustment to zero. The head of the micrometer, *n*, is also divided, and may be used with the divisions of the brass bar guide. The cross-head, *o*, is movable on its steel rod guide, *q*, for the perfect adjustment of the pulley about the centre of motion of the crank-axis. The fine-toothed wheel, *i*, into which the endless screw, *h*, works as previously described, is fitted on a slotted cone, *u*, (see Fig. 2, Plate X) which can be clamped to the crank-axis by means of a screw-nut, *v*. This arrangement is necessary, because each of the components requires to be set in its proper position, previously determined by calculation, at the commencement before starting the machine. The setting dials, *b*, are toothed round their outer edges and movable round their centres by a pinion for setting.

A fine flexible wire fixed to a large screw-head, *S*, (see Fig. 1, Plate IX) below the date-dial, passes alternately under and over the pulleys of the lower and upper series of components, till leaving the large pulley, it hangs vertically above the ink-recorder slide. The screw-head allows of the pen point of the ink-recorder being brought accurately to zero, when the components are each set to zero or brought to zero of their respective scales. A back screw to the screw-head prevents the latter from slipping when properly adjusted. It is necessary that this zero should be determined before the curves are run off, on account of the variation of the length of wire from change of temperature. The wire carries at its free end an ink-bottle fitted with a fine glass tracing point. The ink-recorder travels in a geometrical slide, and is suspended to give just sufficient pressure to ensure contact with the paper of recording barrel. The recording barrel is fitted with brass pins at equidistant intervals, to form the time indications on the paper by perforation. A vertical automatic ruling apparatus is available for ruling the vertical time lines, but on account of the recording paper being very thin, the resulting inked line is not always so perfect as desirable. In practice it has been found better to rule the time lines through the machine perforations by hand, a whole year's rulings only occupying about an hour and a half. An index for setting the recording barrel to time is fitted behind the framework near the upper axis of the barrel. The paper, which is continuous, and supplied from a reel, *w*, (see Fig. 3, Plate X) passes round two grooved rollers, *x*, at the back of the recording barrel, and is held in position whilst the pins enter the paper, and, after receiving the traced curves, is wound round the receiving barrel, *y*. The reel, on which the continuous paper is contained, is provided with a brake brush, which ensures a proper tension of the paper as it leaves the reel. The receiving barrel rests on toothed driving wheels, which are driven by the recording barrel, and by friction turns and slips to accommodate itself to receive the recorded paper. Motion is given to the whole system of wheel-work through the horizontal centre main shaft, *c*, from a clock-work driving gear at the bottom of the machine, the whole being originally driven by a weight of about one hundred-weight, and controlled by a fan. A warning bell sounds when the weight is nearly run down, and also when in winding, the operation is nearly completed. The length of the barrel round which the cord is wound is sufficient to give 15,000 turns of the main shaft. This corresponds to about three months' run of curves, and occupies about one hour to run off. A year's tides for any port occupy about four hours in running off.

In consequence of the height of the building in which the machine was placed not admitting of the full length of the cord being used, multiple pulleys had to be employed, thereby increasing the driving weight; the time occupied, however, was reduced to about two hours for a year's predictions. In 1891, when the components were augmented, advantage was taken of continuous water power, and a small water-motor, *M*, (see Fig. 1, Plate IX) was fitted for driving the machine with perfect success and regularity, the time occupied being about two hours, for a full year's predictions: the motor, *M*, has been omitted in Fig. 2 of Plate IX for clearness. The weight-driving gear is also available in case of failure from the water supply.

The setting of the machine for the prediction of any port, for which the tidal components are known, is as follows:—The dials, *b*, are first turned so that the value of κ found from the tidal reductions, is exactly under or above the highest or lowest point according as the component is situated on the upper or lower row of components. The cranks, *k*, are set vertically—the slotted cone, *u*, (see Fig. 2, Plate X) of the wheel, *i*, on the axle, *l*, having been first released—and the guide-pin, *m*, thrown out to its proper range according to the scale required to represent the half amplitude of the component. The scale on which the predictions are represented varies from a half-inch to the foot in the case of Bhávnagar to six inches (or half actual scale) to the foot for the Ceylon and adjacent ports. The width of the recording paper is twenty-two inches. The setting scale being in millimetres, to represent the curves on a scale of one inch to the foot for setting it is necessary to multiply the value in feet of each half-amplitude ($\frac{1}{2}$R) by 25·4 or each amplitude (R) by 12·7, and in proportion for other scales. The proper position of the hands, *a*, having been previously determined by calculation for the time of starting, the hands are set and the slotted cones are tightened up. These positions are the values of $V_0 + u$ and are generally found for noon of the day preceding the first day for which the predictions are required. The angles, ζ

are in this way automatically found on the machine. The recording barrel, which is twenty-four inches in circumference, is then set to the time for which the values of $V_0 + u$ have been found, and the wheel-work set in motion.

The date-dial in the centre shows the progress of the record, which can be marked occasionally to facilitate the entry of the dates after the record has been removed from the machine. The date-dial containing only twenty-eight days for February, care should be taken to date the record one day back after March 1 in bissextile years, or to shift the dial hand back one day when it has arrived at March 1, by which means the dates will then correspond correctly to the days of the year. Noon, midnight, &c., are distinguished from the perforations of the other hours of the day by a few supplementary pins. Two speeds of travel can be given to the paper. These were originally one inch and one half-inch per hour, but subsequently these were reduced to one quarter-inch and one-eighth inch per hour, as these latter were found to be quite sufficient for the purposes of reading off. The pin perforations are one inch apart so that with the larger speed now fitted on the machine a day's tides occupy only six inches of paper. The extra pin perforations originally used to distinguish 6 hours, 12 hours and 18 hours of each day, now represent successive noons. A fixed vertical rod near the ink-recorder slide carries ruling-pens for the tracing of base-lines, such as dock-sills, river bars, or mean-tide levels. In practice it has been usual to use two horizontal lines only—one representing mean-tide level (R_0 of the tidal reductions) and a lower one representing Indian Spring Low-water mark as defined in the tidal reductions. It is to the latter that the predictions in height are usually referred. If desired the paper can be ruled its entire width to represent feet, metres, &c., as it passes through the machine. An idea of the saving that is effected by the machine may be gathered from the fact that tide-curves computed by an expert calculator to include the same number of components as comprised in the machine, could not be worked out in less than five or six months for the year's tides at any port. These can be run off by the machine in about two hours, and then only require the heights and times to be read off.

The value of the machine is very great in any work where the whole tide-curve is of service, and is of great value in engineering works in which a fore-knowledge of the tides is necessary, such as in constructing the foundations of quay walls, embankments, dock-sills, &c., the whole time during which the work can be prosecuted being seen at a glance for every tide.

The machine as a whole is the design of Mr. Edward Roberts of the Nautical Almanac Office, while the improved parallel slide fitted to each tidal component is due to Lord Kelvin (Sir William Thomson), and the use of the fine flexible wire for summing the whole of the components is the suggestion of Mr. Beauchamp Tower. The machine was made by Messrs. A. Légé & Co., of London, by whom also the alterations and additions were carried out. As evidencing the makers' excellent workmanship, it may be mentioned that, when the machine was taken to pieces in 1891 for alteration, little or no wear was observable in the working parts, although the machine had been constantly in use for nearly twelve years.

2.

The Preparation of the Tide Tables for the Indian Ports.

The tide-predicting machine, combining some twenty-four tidal components, gives results with great accuracy for all open coast stations. These comprise the bulk of the Indian ports. The preparation of the tables of high and low waters, from the traced curves of the machine, is most simply effected by obtaining the times of the highest and lowest points of the curves, and their measurements from the datum line for the heights according to the scale for which the machine has been set. For tidal stations situated, however, at some considerable distance from the mouths of rivers or in estuaries having a considerable shallow foreshore, the number of over-tides and compound shallow-water components contained on the machine is not sufficient to represent, with the accuracy desired, the actual tidal curve. In addition to the above, the tides are greatly affected by the freshets in the rivers, which alter the normal times and heights very considerably through several months of the year.

In order therefore to give the best results obtainable, recourse has been had to a combination of the method pursued by the Hydrographic Office of the Admiralty, modified, however, to include the effects of the freshets, with the results for the diurnal tides obtainable by the tide-predictor as hereafter explained.

The ordinary method of reduction, pursued by the Hydrographic Office, is to refer the observed times and heights of high waters*, extending over a considerable period, to the apparent times of transits of the Moon preceding the time of high water. The best transit to which to refer the observations can be determined from the values of κ, deduced from the harmonic analysis of the two chief tides of the port in question or of those of an adjacent port. The difference between the values of κ of the mean lunar semi-diurnal tide and that of the mean solar semi-diurnal tide, divided by twice the Moon's mean daily synodic motion will give the mean value of the retardation of the times of high water after the Moon's transit. For instance, if we take the values obtained for Bombay, we have

$$\frac{\kappa \text{ of } S_2 - \kappa \text{ of } M_2}{24^\circ \cdot 38} \text{ or } \frac{3^\circ \cdot 2 - 329^\circ \cdot 9}{24^\circ \cdot 38} = \frac{33^\circ \cdot 3}{24^\circ \cdot 38} = 1^d \cdot 37 \text{ or } 33^h \pm .$$

Having determined the Moon's transit to which the observations are to be referred, they are divided into twelve groups, *viz.*, all those tides depending on the Moon's transits which occur between $0^h\ 0^m$ and $1^h\ 0^m$ or $12^h\ 0^m$ and $13^h\ 0^m$ forming one group, all those high waters between $1^h\ 0^m$ and $2^h\ 0^m$ or $13^h\ 0^m$ and $14^h\ 0^m$ forming a second group and similarly through each of the twelve hours. The means of the Moon's transits and of the times and heights of high water depending on them are then taken. The results will give the mean times and mean heights of high water for values of the Moon's transit about $0^h\ 30^m$, $1^h\ 30^m$, $2^h\ 30^m$, etc. If the means of the Moon's transit do not equal 30^m exactly, they are made to do so, the times and heights depending on them being corrected accordingly. Having now the values for each hour of Moon's transit, *viz.*, at $0^h\ 30^m$, $1^h\ 30^m$, etc., the values for intermediate times of Moon's transit are obtained in the usual way by interpolation. It is usual to prepare a table for each 10^m of Moon's transit, *i.e.*, five values are inserted between each of the twelve original quantities. The values of the heights are similarly treated. If the Indian riverain observations were treated as above, the results would include the mean effect due to the freshets. In order, however, to obtain the actual values due to the freshets which occur with fair regularity each year, a modification of the above method has been introduced, *viz.*, in place of a considerable period of observations (usually a year) being treated as a whole, each month is treated separately, so that twelve sets of values are obtained similar to the above for each year's observations. In order to obtain good values it is, however, necessary that the observations extending over some years should be thus treated, as the number of observations in any one month, depending on a certain hour of Moon's transit, is much too few to give a mean value fairly reliable. It may be here remarked that it is not necessary to find the time of the Moon's transit for the particular place in question, and in practice it has been the rule to refer the times and heights to the transits at Greenwich, which are given in the Nautical Almanac. In the predictions the Greenwich transits are again used, whereby a saving is effected both in the reductions of the observations and the actual predictions.

The next step in the work is the finding of the corrections due to the lunar and solar parallaxes, and the lunar and solar declinations. For this purpose recourse has been had to the following tables of the late Sir John Lubbock, published in "An Elementary Treatise† on the Tides. London, 1839."

* The low waters have hitherto not received the same attention.

† In this treatise the successive transits of the Moon are denoted by the letters A, B, C, D, E and F:—F is supposed to denote the time of the transit of the Moon immediately preceding the time of high water at London Docks.

TABLE I.—*Showing the correction for the Moon's Declination.*

☽'s Transit B.	0° Dec.	3° Dec.	6° Dec.	9° Dec.	12° Dec.	15° Dec.	18° Dec.	21° Dec.	24° Dec.	27° Dec.	30° Dec.	☽'s Transit B.
h	m	m	m	m	m	m	m	m	m	m	m	h
0	− 1	− 1	0	0	0	0	+ 1	+ 1	+ 1	+ 1	+ 2	0
1	+ 1	+ 1	0	0	0	0	− 1	− 1	− 1	− 1	− 2	1
2	+ 2	+ 2	+ 1	+ 1	+ 1	0	− 1	− 1	− 2	− 3	− 4	2
3	+ 3	+ 3	+ 3	+ 2	+ 1	0	− 1	− 2	− 3	− 5	− 7	3
4	+ 3	+ 3	+ 3	+ 2	+ 1	0	− 1	− 3	− 5	− 7	− 10	4
5	+ 3	+ 3	+ 3	+ 2	+ 1	0	− 2	− 4	− 6	− 9	− 12	5
6	+ 2	+ 2	+ 2	+ 1	+ 1	0	− 1	− 2	− 4	− 4	− 5	6
7	− 2	− 2	− 2	− 1	− 1	0	+ 1	+ 2	+ 4	+ 4	+ 5	7
8	− 3	− 3	− 3	− 2	− 1	0	+ 2	+ 4	+ 6	+ 9	+ 12	8
9	− 3	− 3	− 3	− 2	− 1	0	+ 1	+ 3	+ 5	+ 7	+ 10	9
10	− 3	− 3	− 3	− 2	− 1	0	+ 1	+ 2	+ 3	+ 5	+ 7	10
11	− 2	− 2	− 1	− 1	− 1	0	+ 1	+ 1	+ 2	+ 3	+ 4	11

TABLE II.—*Showing the correction for the Moon's Parallax.*

☽'s Transit B.	H. P. 54′	H. P. 55′	H. P. 56′	H. P. 57′	H. P. 58′	H. P. 59′	H. P. 60′	H. P. 61′	☽'s Transit B.
h	m	m	m	m	m	m	m	m	h
0	+ 1	+ 1	+ 1	0	0	− 1	− 1	− 1	0
1	− 1	− 1	− 1	0	0	+ 1	+ 1	+ 1	1
2	− 3	− 2	− 1	0	+ 1	+ 2	+ 3	+ 4	2
3	− 5	− 3	− 1	0	+ 1	+ 3	+ 5	+ 7	3
4	− 7	− 5	− 2	0	+ 2	+ 4	+ 6	+ 8	4
5	− 9	− 6	− 3	0	+ 2	+ 5	+ 7	+ 9	5
6	− 4	− 2	− 1	0	+ 1	+ 2	+ 3	+ 4	6
7	+ 4	+ 2	+ 1	0	− 1	− 2	− 3	− 4	7
8	+ 9	+ 6	+ 3	0	− 2	− 5	− 7	− 9	8
9	+ 7	+ 5	+ 2	0	− 2	− 4	− 6	− 8	9
10	+ 5	+ 3	+ 1	0	− 1	− 3	− 5	− 7	10
11	+ 3	+ 2	+ 1	0	− 1	− 2	− 3	− 4	11

TABLE III.—*Showing the correction for the Sun's Declination.*

☽'s Transit B.	0° Dec.	3° Dec.	6° Dec.	9° Dec.	12° Dec.	15° Dec.	18° Dec.	21° Dec.	24° Dec.	☽'s Transit B.
h	m	m	m	m	m	m	m	m	m	h
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	+1	1
2	−1	−1	−1	−1	0	0	0	+1	+2	2
3	−2	−1	−1	−1	0	0	+1	+2	+4	3
4	−3	−2	−1	−2	0	0	+2	+3	+5	4
5	−3	−2	−2	−1	−1	0	+1	+3	+5	5
6	−1	−1	−1	−1	0	0	+1	+1	+2	6
7	+1	+1	+1	+1	0	0	−1	−2	−2	7
8	+3	+2	+2	+1	+1	0	−2	−3	−5	8
9	+3	+2	+1	+2	0	0	−2	−3	−5	9
10	+2	+1	+1	+1	0	0	−1	−2	−4	10
11	+1	+1	+1	+1	0	0	0	−1	−2	11

TABLE IV.—*Showing the correction for the Sun's Parallax.*

☽'s Transit B.	Jan. Dec.	Feb. Nov.	March Oct.	April Sept.	May August	June July	☽'s Transit B.
	H. P. 9″·00	H. P. 8″·96	H. P. 8″·88	H. P. 8″·80	H. P. 8″·75	H. P. 8″·70	
h	m	m	m	m	m	m	h
0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1
2	−1	−1	0	0	0	0	2
3	−1	−1	0	0	+1	+1	3
4	−2	−2	0	0	+2	+2	4
5	−3	−2	−1	+1	+3	+3	5
6	−2	−1	−1	+1	+2	+2	6
7	+2	+1	+1	−1	−2	−2	7
8	+3	+2	+1	−1	−3	−3	8
9	+2	+2	0	0	−2	−2	9
10	+1	+1	0	0	−1	−1	10
11	+1	+1	0	0	0	0	11

TABLE V.—*Showing the correction for the Moon's Declination.*

☽'s Transit B.	0° Dec.	3° Dec.	6° Dec.	9° Dec.	12° Dec.	15° Dec.	18° Dec.	21° Dec.	24° Dec.	27° Dec.	30° Dec.	☽'s Transit B.
h	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	h
0	+·32	+·31	+·27	+·21	+·12	0	−·13	−·29	−·47	−·66	−·87	0
1	+·32	+·31	+·27	+·21	+·12	0	−·13	−·29	−·47	−·66	−·87	1
2	+·31	+·30	+·26	+·20	+·11	0	−·13	−·28	−·46	−·65	−·86	2
3	+·30	+·30	+·26	+·20	+·10	0	−·13	−·28	−·45	−·63	−·83	3
4	+·30	+·29	+·25	+·19	+·11	0	−·13	−·27	−·44	−·61	−·80	4
5	+·30	+·29	+·25	+·19	+·11	0	−·13	−·27	−·44	−·61	−·79	5
6	+·31	+·30	+·26	+·20	+·12	0	−·13	−·28	−·46	−·63	−·83	6
7	+·31	+·30	+·26	+·20	+·12	0	−·13	−·28	−·46	−·63	−·83	7
8	+·30	+·29	+·25	+·19	+·11	0	−·13	−·27	−·44	−·61	−·79	8
9	+·30	+·29	+·25	+·19	+·11	0	−·13	−·27	−·44	−·61	−·80	9
10	+·30	+·30	+·26	+·20	+·10	0	−·13	−·28	−·45	−·63	−·83	10
11	+·31	+·30	+·26	+·20	+·11	0	−·13	−·28	−·46	−·65	−·86	11

TABLE VI.—*Showing the correction for the Moon's Parallax.*

☽'s Transit B.	H. P. 54′	H. P. 55′	H. P. 56′	H. P. 57′	H. P. 58′	H. P. 59′	H. P. 60′	H. P. 61′	☽'s Transit B.
h	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	h
0	−·66	−·45	−·23	0	+·24	+·49	+·74	+1·00	0
1	−·66	−·45	−·23	0	+·24	+·49	+·74	+1·00	1
2	−·65	−·44	−·23	0	+·23	+·47	+·72	+ ·98	2
3	−·63	−·43	−·22	0	+·22	+·46	+·71	+ ·96	3
4	−·61	−·42	−·21	0	+·22	+·45	+·69	+ ·94	4
5	−·63	−·43	−·22	0	+·23	+·46	+·70	+ ·96	5
6	−·65	−·45	−·23	0	+·24	+·48	+·73	+ ·99	6
7	−·65	−·45	−·23	0	+·24	+·48	+·73	+ ·99	7
8	−·63	−·43	−·22	0	+·23	+·46	+·70	+ ·96	8
9	−·61	−·42	−·21	0	+·22	+·45	+·69	+ ·94	9
10	−·63	−·43	−·22	0	+·22	+·46	+·71	+ ·96	10
11	−·65	−·44	−·23	0	+·23	+·47	+·72	+ ·98	11

TABLE VII.—*Showing the correction for the Sun's Declination.*

☽'s Transit B.	0° Dec.	3° Dec.	6° Dec.	9° Dec.	12° Dec.	15° Dec.	18° Dec.	21° Dec.	24° Dec.	☽'s Transit B.
h	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	h
0	+·12	+·11	+·10	+·08	+·04	0	−·05	−·11	−·18	0
1	+·12	+·11	+·10	+·08	+·04	0	−·05	−·11	−·18	1
2	+·10	+·09	+·08	+·06	+·04	0	−·05	−·10	−·15	2
3	+·07	+·06	+·05	+·04	+·02	0	−·03	−·06	−·10	3
4	+·01	+·01	+·01	+·01	−·00	0	−·01	−·01	−·02	4
5	−·06	−·06	−·05	−·04	−·02	0	+·03	+·05	+·08	5
6	−·11	−·10	−·10	−·07	−·04	0	+·05	+·10	+·15	6
7	−·11	−·10	−·10	−·07	−·04	0	+·05	+·10	+·15	7
8	−·06	−·06	−·05	−·04	−·02	0	+·03	+·05	+·08	8
9	+·01	+·01	+·01	+·01	+·00	0	−·01	−·01	−·02	9
10	+·07	+·06	+·05	+·04	+·02	0	−·03	−·05	−·10	10
11	+·10	+·09	+·08	+·06	+·04	0	−·05	−·10	−·15	11

TABLE VIIa.—*Showing the correction for the Sun's Parallax.*

☽'s Transit B.	Jan. Dec.	Feb. Nov.	March Oct.	April Sept.	May August	June July	☽'s Transit B.
	H. P. 9″·00	H. P. 8″·96	H. P. 8″·88	H. P. 8″·80	H. P. 8″·75	H. P. 8″·70	
h	Feet	Feet	Feet	Feet	Feet	Feet	h
0	+·09	+·06	+·03	−·03	−·05	−·08	0
1	+·09	+·06	+·03	−·03	−·05	−·08	1
2	+·07	+·04	+·02	−·02	−·04	−·07	2
3	+·04	+·03	+·01	−·01	−·03	−·04	3
4	+·01	+·01	+·01	−·01	−·01	−·01	4
5	−·04	−·03	−·01	+·01	+·02	+·03	5
6	−·08	−·05	−·03	+·03	+·05	+·07	6
7	−·08	−·05	−·03	+·03	+·05	+·07	7
8	−·04	−·03	−·01	+·01	+·02	+·03	8
9	+·01	+·01	+·01	−·01	−·01	−·01	9
10	+·04	+·03	+·01	−·01	−·03	−·04	10
11	+·07	+·04	+·02	−·02	−·04	−·07	11

These tables are strictly for the London Docks, but can be used, without alteration for the semi-diurnal tides of any port, for the corrections for the times of high water unaltered, and for the heights by using corrections in proportion to the ranges of the semi-diurnal tides at London and the port in question. The corrections for the times of low water at the London Docks, have not been determined but have been assumed the same as for the high water, and have been so used in the prediction of the times of low water for the Indian riverain ports. The corrections for the heights of low waters will be of opposite sign to those for the high waters. The times of low water in the reductions are referred to the same Moon's transit as the *succeeding* high water, the low waters preceding the high waters by a shorter interval than that between the low water and the previous high water. In riverain ports at a considerable distance from the river's mouth, the high water succeeds the low water by a few hours only, the times being coincident at the place where the tidal flow ceases.

The following table exhibits the approximate interval after the Moon's transit to which the predictions are referred for the Indian riverain ports determined on this system :—

	Interval after Moon's transit to time of Low water	High water
Dublat (Saugor Island) Hooghly River	29^h	35^h
Diamond Harbour "	32	36
Kidderpore (Calcutta) "	35	39
Chittagong	33	38
Elephant Point, Rangoon River	35	40
Rangoon "	36	41
Amherst, Moulmein River	34	39
Moulmein "	37	40

The corrections to the heights of high water and low water for the above ports, are obtained from those for London by multiplying them by the following factors, the values for London being taken as unity :—

	Factor for High water	Factor for Low water
Dublat (Saugor Island) Hooghly River	1·2	−1·2
Diamond Harbour "	1·4	−1·0
Kidderpore (Calcutta) "	1·2	−0·3
Chittagong	1·0	−0·5
Elephant Point, Rangoon River	1·6	−1·4
Rangoon "	1·4	−0·9
Amherst, Moulmein River	1·8	−1·8
Moulmein "	1·6	−1·2

The times of high water being now corrected as above explained, it has been usual to alter them slightly at the end of each month and at the beginning of the next, to smooth away the roughness in the flow of the numbers on account of the difference arising from the use of the slightly different values of the semi-menstrual curve used for successive months. The heights are similarly treated and the times and heights of the low waters also.

The times and heights now represent the tides depending on the semi-diurnal tides and corrected approximately for the effects of the freshets. The effects of the diurnal tides have now to be found.

The values of these components, *viz.*, those of S, K, O, P, J and Q, are determined in the usual way by the harmonic analysis of the tidal observations. These values being put on the tide-predictor, all the other components having been put to zero, the continuous curve for the whole year is run off. The value in height above or below mean-tide level is then found for each of the approximate times of high and low water. These values are combined with the corrected heights previously found. The resulting heights give the quantities published in the Tide Tables. It now only remains to correct the times similarly for the diurnal tides. The correction due to the diurnal tides will be *nil*, when the diurnal tide is at its maximum effect either above or below mean-tide level, *i.e.*, when it has no *variation*, and will be greatest when the variation is greatest. The difference between alternate values of the diurnal correction in height serves as a basis for obtaining the corrections in time. These alternate values are already tabulated for the correction in height. The latest determination of the best values is found to be the division of the *difference* between alternate values of the diurnal correction in heights expressed in hundredths of a foot by 5, the resulting quotient representing minutes of time. For instance, if the difference between two consecutive corrections in height for diurnal tides is found to be 0·35 foot, then the correction in time to the intermediate high or low water is represented by 7 minutes.

For the high-water correction, if the differences are increasing *positively*, then the corrections to the time of high water is *positive*, or in other words, as the effect of the diurnal tide is to prolong the tidal flow, the time of high water will be retarded thereby. On the other hand, if the difference is increasing *negatively*, then the correction will be *negative*, or in other words the time of high water will be accelerated and *vice versâ*. For the times of low water, the corrections will be the opposite, *i.e.*, if the differences are increasing *positively*, then the times will be accelerated, or the correction to the times will be *negative*, and on the other hand, if the differences are increasing *negatively*, then the times will be retarded, *i.e.*, the correction to the times will be *positive*. By using thus a common factor, the mean value only of the correction to the diurnal tides is obtained. The corrections thus formed will be slightly too large at the time of spring-tides as ordinarily understood, and too small at neap-tides, but the error introduced is probably small, and the correct values would create an amount of labour probably not recompensed by the extra labour involved.

The following are the tables actually used: they are practically the same in substance as Sir J. Lubbock's tables, but they are enlarged and re-arranged in a more convenient form:—

TABLE No. 1.—Corrections to Times of High Water for Moon's Declination.

Declination	0^h			1^h			2^h			3^h			4^h			5^h		
	0^m	20^m	40^m	0^m	20^m	40^m	0^m	20^m	40^m	0^m	20^m	40^m	0^m	20^m	40^m	0^m	20^m	40^m
°	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0	− 0·8	− 0·3	+ 0·3	+ 0·8	+ 1·2	+ 1·6	+ 1·9	+ 2·2	+ 2·5	+ 2·8	+ 3·0	+ 3·1	+ 3·2	+ 3·3	+ 3·3	+ 3·2	+ 2·9	+ 2·5
1	0·8	0·3	0·3	0·8	1·2	1·6	1·9	2·2	2·4	2·7	2·9	3·0	3·1	3·2	3·2	3·1	2·8	2·4
2	0·8	0·3	0·3	0·8	1·1	1·5	1·8	2·1	2·3	2·6	2·8	2·9	3·0	3·1	3·1	3·0	2·7	2·3
3	0·8	0·3	0·3	0·8	1·1	1·5	1·8	2·0	2·2	2·4	2·6	2·8	2·9	3·0	3·0	2·9	2·6	2·2
4	− 0·7	− 0·3	+ 0·3	+ 0·7	+ 1·1	+ 1·4	+ 1·7	+ 1·9	+ 2·1	+ 2·3	+ 2·5	+ 2·6	+ 2·7	+ 2·8	+ 2·8	+ 2·7	+ 2·4	+ 2·1
5	0·7	0·3	0·3	0·7	1·0	1·4	1·6	1·8	2·0	2·1	2·4	2·5	2·6	2·7	2·7	2·6	2·3	2·0
6	0·6	0·2	0·2	0·6	1·0	1·3	1·5	1·7	1·8	1·9	2·2	2·4	2·5	2·6	2·6	2·5	2·2	1·8
7	0·6	0·2	0·2	0·6	0·9	1·2	1·4	1·6	1·7	1·8	2·0	2·3	2·3	2·4	2·4	2·3	2·1	1·7
8	− 0·5	− 0·2	+ 0·3	+ 0·5	+ 0·8	+ 1·1	+ 1·3	+ 1·4	+ 1·6	+ 1·7	+ 1·9	+ 2·1	+ 2·1	+ 2·2	+ 2·2	+ 2·1	+ 1·9	+ 1·6
9	0·4	0·2	0·2	0·4	0·7	1·0	1·1	1·3	1·4	1·6	1·7	1·9	1·9	2·0	2·0	1·9	1·7	1·4
10	0·4	0·2	0·2	0·4	0·6	0·8	1·0	1·1	1·3	1·4	1·5	1·6	1·6	1·7	1·7	1·6	1·5	1·3
11	0·3	0·1	0·1	0·3	0·5	0·7	0·8	0·9	1·1	1·1	1·2	1·3	1·3	1·4	1·4	1·3	1·2	1·1
12	− 0·2	− 0·1	+ 0·1	+ 0·2	+ 0·4	+ 0·6	+ 0·6	+ 0·7	+ 0·9	+ 0·9	+ 0·9	+ 1·0	+ 1·0	+ 1·1	+ 1·1	+ 1·0	+ 0·9	+ 0·9
13	0·2	0·1	0·1	0·2	0·3	0·4	0·4	0·5	0·6	0·6	0·6	0·7	0·7	0·8	0·8	0·7	0·6	0·6
14	0·1	0·1	0·1	0·1	0·1	0·2	0·2	0·2	0·3	0·3	0·3	0·4	0·4	0·4	0·4	0·4	0·3	0·3
15	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0
16	+ 0·1	+ 0·1	− 0·1	− 0·1	− 0·1	− 0·2	− 0·2	− 0·3	− 0·3	− 0·3	− 0·4	− 0·4	− 0·4	− 0·5	− 0·5	− 0·5	− 0·4	− 0·4
17	0·2	0·1	0·1	0·2	0·2	0·4	0·4	0·5	0·6	0·7	0·8	0·8	0·9	1·0	1·0	1·0	0·9	0·8
18	0·3	0·2	0·2	0·3	0·4	0·6	0·6	0·8	1·0	1·1	1·2	1·3	1·4	1·5	1·6	1·6	1·5	1·2
19	0·4	0·2	0·2	0·4	0·5	0·8	0·8	1·1	1·3	1·5	1·7	1·8	1·9	2·1	2·2	2·2	2·0	1·7
20	+ 0·5	+ 0·2	− 0·2	− 0·5	− 0·6	− 1·0	− 1·1	− 1·4	− 1·7	− 1·9	− 2·2	− 2·3	− 2·5	− 2·7	− 2·9	− 2·9	− 2·6	− 2·2
21	0·6	0·3	0·3	0·6	0·8	1·3	1·4	1·7	2·1	2·4	2·7	2·9	3·1	3·4	3·6	3·6	3·2	2·7
22	0·7	0·3	0·3	0·7	0·9	1·6	1·7	2·0	2·5	2·8	3·2	3·5	3·8	4·1	4·3	4·3	3·9	3·2
23	0·8	0·3	0·3	0·8	1·1	1·8	2·0	2·4	2·9	3·3	3·7	4·1	4·5	4·8	5·1	5·1	4·6	3·7
24	+ 0·9	+ 0·4	− 0·4	− 0·9	− 1·2	− 2·1	− 2·4	− 2·8	− 3·4	− 3·8	− 4·3	− 4·7	− 5·2	− 5·6	− 5·9	− 5·9	− 5·4	− 4·3
25	1·0	0·4	0·4	1·0	1·4	2·3	2·7	3·2	3·9	4·3	4·9	5·3	6·0	6·4	6·8	6·8	6·2	4·9
26	1·2	0·5	0·5	1·2	1·6	2·6	3·0	3·6	4·4	4·9	5·5	6·0	6·8	7·2	7·7	7·7	7·0	5·5
27	1·3	0·5	0·5	1·3	1·8	2·8	3·3	4·1	4·9	5·5	6·2	6·7	7·6	8·1	8·6	8·6	7·8	6·2
28	+ 1·4	+ 0·5	− 0·5	− 1·4	− 2·1	− 3·0	− 3·7	− 4·5	− 5·4	− 6·1	− 6·8	− 7·5	− 8·4	− 9·0	− 9·6	− 9·6	− 8·6	− 6·8
29	1·6	0·6	0·6	1·6	2·3	3·2	4·0	4·9	5·9	6·7	7·5	8·3	9·2	10·0	10·6	10·6	9·5	7·5
30	1·7	0·6	0·6	1·7	2·6	3·5	4·3	5·4	6·4	7·3	8·1	9·1	10·0	11·0	11·7	11·7	10·5	8·1

Example.—Moon's Apparent Transit 3^h 40^m and Declination 25°; correction = − $5^m{\cdot}3$.

Arguments—Moon's Declination and Apparent Transit.

6h			7h			8h			9h			10h			11h				Declination
0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	60m	
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	°
+ 2·0	+ 0·9	− 0·9	− 2·0	− 2·5	− 2·9	− 3·2	− 3·3	− 3·3	− 3·2	− 3·1	− 3·0	− 2·8	− 2·5	− 2·2	− 1·9	− 1·6	− 1·2	− 0·8	0
1·9	0·9	0·9	1·9	2·4	2·8	3·1	3·2	3·2	3·1	3·0	2·9	2·7	2·4	2·2	1·9	1·6	1·2	0·8	1
1·8	0·9	0·9	1·8	2·3	2·7	3·0	3·1	3·1	3·0	2·9	2·8	2·6	2·3	2·1	1·8	1·5	1·1	0·8	2
1·8	0·8	0·8	1·8	2·2	2·6	2·9	3·0	3·0	2·9	2·8	2·6	2·4	2·2	2·0	1·8	1·5	1·1	0·8	3
+ 1·7	+ 0·8	− 0·8	− 1·7	− 2·1	− 2·4	− 2·7	− 2·8	− 2·8	− 2·7	− 2·6	− 2·5	− 2·3	− 2·1	− 1·9	− 1·7	− 1·4	− 1·1	− 0·7	4
1·6	0·8	0·8	1·6	2·0	2·3	2·6	2·7	2·7	2·6	2·5	2·4	2·1	2·0	1·8	1·6	1·4	1·0	0·7	5
1·5	0·7	0·7	1·5	1·8	2·2	2·5	2·6	2·6	2·5	2·4	2·2	1·9	1·8	1·7	1·5	1·3	1·0	0·6	6
1·4	0·7	0·7	1·4	1·7	2·1	2·3	2·4	2·4	2·3	2·3	2·0	1·8	1·7	1·6	1·4	1·2	0·9	0·6	7
+ 1·3	+ 0·6	− 0·6	− 1·3	− 1·6	− 1·9	− 2·1	− 2·2	− 2·2	− 2·1	− 2·1	− 1·9	− 1·7	− 1·6	− 1·4	− 1·3	− 1·1	− 0·8	− 0·5	8
1·1	0·5	0·5	1·1	1·4	1·7	1·9	2·0	2·0	1·9	1·9	1·7	1·6	1·4	1·3	1·1	1·0	0·7	0·4	9
1·0	0·5	0·5	1·0	1·3	1·5	1·6	1·7	1·7	1·6	1·6	1·5	1·4	1·3	1·1	1·0	0·8	0·6	0·4	10
0·8	0·4	0·4	0·8	1·1	1·2	1·3	1·4	1·4	1·3	1·3	1·2	1·1	1·1	0·9	0·8	0·7	0·5	0·3	11
+ 0·6	+ 0·3	− 0·3	− 0·6	− 0·9	− 0·9	− 1·0	− 1·1	− 1·1	− 1·0	− 1·0	− 0·9	− 0·9	− 0·9	− 0·7	− 0·6	− 0·6	− 0·4	− 0·2	12
0·4	0·2	0·2	0·4	0·6	0·6	0·7	0·8	0·8	0·7	0·7	0·6	0·6	0·6	0·5	0·4	0·4	0·3	0·2	13
0·2	0·1	0·1	0·2	0·3	0·3	0·4	0·4	0·4	0·4	0·4	0·3	0·3	0·3	0·2	0·2	0·2	0·1	0·1	14
0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	15
− 0·2	− 0·1	+ 0·1	+ 0·2	+ 0·4	+ 0·4	+ 0·5	+ 0·5	+ 0·5	+ 0·4	+ 0·4	+ 0·4	+ 0·3	+ 0·3	+ 0·3	+ 0·2	+ 0·2	+ 0·1	+ 0·1	16
0·5	0·2	0·2	0·5	0·8	0·9	1·0	1·0	1·0	0·9	0·8	0·8	0·7	0·6	0·5	0·4	0·4	0·2	0·2	17
0·7	0·3	0·3	0·7	1·2	1·5	1·6	1·6	1·5	1·4	1·3	1·2	1·1	1·0	0·8	0·6	0·6	0·4	0·3	18
1·0	0·4	0·4	1·0	1·7	2·0	2·2	2·2	2·1	1·9	1·8	1·7	1·5	1·3	1·1	0·8	0·8	0·5	0·4	19
− 1·3	− 0·5	+ 0·5	+ 1·3	+ 2·2	+ 2·6	+ 2·9	+ 2·9	+ 2·7	+ 2·5	+ 2·3	+ 2·2	+ 1·9	+ 1·7	+ 1·4	+ 1·1	+ 1·0	+ 0·6	+ 0·5	20
1·6	0·6	0·6	1·6	2·7	3·2	3·6	3·6	3·4	3·1	2·9	2·7	2·4	2·1	1·7	1·4	1·3	0·8	0·6	21
1·9	0·7	0·7	1·9	3·2	3·9	4·3	4·3	4·1	3·8	3·5	3·2	2·8	2·5	2·0	1·7	1·6	0·9	0·7	22
2·3	0·8	0·8	2·3	3·7	4·6	5·1	5·1	4·8	4·5	4·1	3·7	3·3	2·9	2·4	2·0	1·8	1·1	0·8	23
− 2·6	− 0·9	+ 0·9	+ 2·6	+ 4·3	+ 5·4	+ 5·9	+ 5·9	+ 5·6	+ 5·2	+ 4·7	+ 4·3	+ 3·8	+ 3·4	+ 2·8	+ 2·4	+ 2·1	+ 1·2	+ 0·9	24
3·0	1·1	1·1	3·0	4·9	6·2	6·8	6·8	6·4	6·0	5·3	4·9	4·3	3·9	3·2	2·7	2·3	1·4	1·0	25
3·4	1·2	1·2	3·4	5·5	7·0	7·7	7·7	7·2	6·8	6·0	5·5	4·9	4·4	3·6	3·0	2·6	1·6	1·2	26
3·8	1·3	1·3	3·8	6·3	7·8	8·6	8·6	8·1	7·6	6·7	6·2	5·5	4·9	4·1	3·3	2·8	1·8	1·3	27
− 4·2	− 1·5	+ 1·5	+ 4·2	+ 6·8	+ 8·6	+ 9·6	+ 9·6	+ 9·0	+ 8·4	+ 7·5	+ 6·8	+ 6·1	+ 5·4	+ 4·5	+ 3·7	+ 3·0	+ 2·1	+ 1·4	28
4·6	1·6	1·6	4·6	7·5	9·5	10·6	10·6	10·0	9·2	8·3	7·5	6·7	5·9	4·9	4·0	3·2	2·3	1·6	29
5·0	1·8	1·8	5·0	8·1	10·5	11·7	11·7	11·0	10·0	9·1	8·1	7·3	6·4	5·4	4·3	3·5	2·6	1·7	30

Example.—Moon's Apparent Transit 3h 40m and Declination 25°; correction = − 5m·3.

TABLE No. 2.—Correction to Times of High Water. Arguments—

H. P.		0h			1h			2h			3h			4h			5h		
		0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m
′	″	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
54	0	+ 1·0	+ 0·3	− 0·3	− 1·0	− 1·7	− 2·4	− 3·1	− 3·8	− 4·6	− 5·4	− 6·3	− 7·1	− 7·7	− 8·2	− 8·5	− 8·6	− 8·0	− 7·0
	15	0·9	0·3	0·3	0·9	1·5	2·2	2·8	3·5	4·2	5·0	5·8	6·5	7·0	7·6	7·8	7·9	7·4	6·4
	30	0·8	0·3	0·3	0·8	1·4	2·0	2·6	3·2	3·8	4·5	5·3	5·9	6·4	6·9	7·1	7·2	6·7	5·8
	45	0·7	0·2	0·2	0·7	1·2	1·8	2·3	2·9	3·4	4·1	4·8	5·3	5·8	6·2	6·4	6·5	6·1	5·2
55	0	+ 0·6	+ 0·2	− 0·2	− 0·6	− 1·1	− 1·6	− 2·1	− 2·5	− 3·1	− 3·6	− 4·2	− 4·7	− 5·2	− 5·5	− 5·7	− 5·8	− 5·4	− 4·7
	15	0·5	0·2	0·2	0·5	0·9	1·4	1·8	2·2	2·7	3·2	3·7	4·1	4·5	4·9	5·0	5·1	4·8	4·1
	30	0·4	0·1	0·1	0·4	0·8	1·2	1·6	1·9	2·3	2·7	3·2	3·5	3·9	4·2	4·3	4·4	4·1	3·5
	45	0·3	0·1	0·1	0·3	0·6	1·0	1·3	1·6	1·9	2·3	2·7	2·9	3·2	3·5	3·6	3·7	3·4	2·9
56	0	+ 0·2	+ 0·1	− 0·1	− 0·2	− 0·5	− 0·8	− 1·1	− 1·3	− 1·6	− 1·8	− 2·1	− 2·3	− 2·6	− 2·8	− 2·9	− 2·9	− 2·7	− 2·4
	15	0·1	0·0	0·0	0·1	0·3	0·6	0·8	0·9	1·2	1·4	1·6	1·7	1·9	2·1	2·2	2·2	2·0	1·8
	30	0·1	0·0	0·0	0·1	0·2	0·4	0·6	0·6	0·8	0·9	1·1	1·1	1·3	1·4	1·5	1·5	1·3	1·2
	45	0·0	0·0	0·0	0·0	0·1	0·2	0·3	0·3	0·4	0·5	0·6	0·6	0·7	0·7	0·8	0·8	0·6	0·6
57	0	+ 0·0	+ 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0	− 0·0
	15	− 0·0	− 0·0	+ 0·0	+ 0·0	+ 0·1	+ 0·2	+ 0·2	+ 0·3	+ 0·4	+ 0·4	+ 0·5	+ 0·5	+ 0·6	+ 0·6	+ 0·6	+ 0·6	+ 0·5	+ 0·4
	30	0·0	0·0	0·0	0·0	0·2	0·4	0·5	0·6	0·8	0·9	1·0	1·0	1·1	1·1	1·1	1·1	1·0	0·9
	45	0·1	0·0	0·0	0·1	0·4	0·6	0·7	0·9	1·2	1·4	1·5	1·6	1·7	1·7	1·7	1·6	1·5	1·3
58	0	− 0·1	− 0·0	+ 0·0	+ 0·1	+ 0·5	+ 0·7	+ 1·0	+ 1·3	+ 1·6	+ 1·9	+ 2·0	+ 2·1	+ 2·2	+ 2·2	+ 2·2	+ 2·1	+ 2·0	+ 1·8
	15	0·2	0·1	0·1	0·2	0·6	0·9	1·2	1·6	2·0	2·4	2·5	2·6	2·8	2·8	2·8	2·7	2·5	2·2
	30	0·2	0·1	0·1	0·2	0·7	1·1	1·5	2·0	2·4	2·9	3·0	3·2	3·3	3·3	3·3	3·2	3·0	2·7
	45	0·3	0·1	0·1	0·3	0·8	1·3	1·7	2·3	2·8	3·4	3·5	3·7	3·9	3·9	3·9	3·8	3·5	3·1
59	0	− 0·4	− 0·1	+ 0·1	+ 0·4	+ 1·0	+ 1·4	+ 2·0	+ 2·7	+ 3·3	+ 3·8	+ 4·1	+ 4·3	+ 4·4	+ 4·4	+ 4·4	+ 4·3	+ 4·0	+ 3·5
	15	0·4	0·1	0·1	0·4	1·1	1·6	2·2	3·0	3·7	4·3	4·6	4·8	5·0	5·0	5·0	4·9	4·5	4·0
	30	0·5	0·2	0·2	0·5	1·2	1·8	2·5	3·4	4·1	4·8	5·1	5·4	5·5	5·5	5·5	5·4	5·0	4·4
	45	0·6	0·2	0·2	0·6	1·3	2·0	2·7	3·7	4·5	5·3	5·6	5·9	6·1	6·1	6·1	6·0	5·5	4·9
60	0	− 0·7	− 0·2	+ 0·2	+ 0·7	+ 1·4	+ 2·1	+ 3·0	+ 4·1	+ 5·0	+ 5·7	+ 6·2	+ 6·5	+ 6·6	+ 6·6	+ 6·6	+ 6·5	+ 6·0	+ 5·3
	15	0·7	0·2	0·2	0·7	1·5	2·3	3·2	4·4	5·4	6·2	6·7	7·0	7·2	7·2	7·2	7·1	6·5	5·7
	30	0·8	0·2	0·2	0·8	1·6	2·5	3·5	4·8	5·8	6·7	7·2	7·6	7·7	7·7	7·7	7·6	7·0	6·2
	45	0·9	0·3	0·3	0·9	1·7	2·7	3·8	5·1	6·2	7·2	7·7	8·1	8·3	8·3	8·3	8·1	7·5	6·6
61	0	− 1·0	− 0·3	+ 0·3	+ 1·0	+ 1·8	+ 2·8	+ 4·1	+ 5·5	+ 6·7	+ 7·6	+ 8·3	+ 8·7	+ 8·8	+ 8·9	+ 8·8	+ 8·6	+ 8·0	+ 7·0
	15	1·1	0·3	0·3	1·1	2·0	3·0	4·4	5·9	7·1	8·1	8·8	9·2	9·4	9·4	9·4	9·1	8·5	7·5

Example.—Moon's Apparent Transit $3^h\,0^m$ and H. P. 59′ 15″; correction = + $4^m·3$.

Moon's Horizontal Parallax and Apparent Transit.

6h			7h			8h			9h			10h			11h				H. P.	
0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	60m		
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	′	″
− 5·0	− 2·0	+ 2·0	+ 5·0	+ 7·0	+ 8·0	+ 8·6	+ 8·5	+ 8·2	+ 7·7	+ 7·1	+ 6·3	+ 5·4	+ 4·6	+ 3·8	+ 3·1	+ 2·4	+ 1·7	+ 1·0	54	0
4·6	1·8	1·8	4·6	6·4	7·4	7·9	7·8	7·6	7·0	6·5	5·8	5·0	4·2	3·5	2·8	2·2	1·5	0·9		15
4·2	1·7	1·7	4·2	5·8	6·7	7·2	7·1	6·9	6·4	5·9	5·3	4·5	3·8	3·2	2·6	2·0	1·4	0·8		30
3·8	1·5	1·5	3·8	5·2	6·1	6·5	6·4	6·2	5·8	5·3	4·8	4·1	3·4	2·9	2·3	1·8	1·2	0·7		45
− 3·4	− 1·3	+ 1·3	+ 3·4	+ 4·7	+ 5·4	+ 5·8	+ 5·7	+ 5·5	+ 5·2	+ 4·7	+ 4·2	+ 3·6	+ 3·1	+ 2·5	+ 2·1	+ 1·6	+ 1·1	+ 0·6	55	0
3·0	1·2	1·2	3·0	4·1	4·8	5·1	5·0	4·9	4·5	4·1	3·7	3·2	2·7	2·2	1·8	1·4	0·9	0·5		15
2·5	1·0	1·0	2·5	3·5	4·1	4·4	4·3	4·2	3·9	3·5	3·2	2·7	2·3	1·9	1·6	1·2	0·8	0·4		30
2·1	0·9	0·9	2·1	2·9	3·4	3·7	3·6	3·5	3·2	2·9	2·7	2·3	1·9	1·6	1·3	1·0	0·6	0·3		45
− 1·7	− 0·7	+ 0·7	+ 1·7	+ 2·4	+ 2·7	+ 2·9	+ 2·9	+ 2·8	+ 2·6	+ 2·3	+ 2·1	+ 1·8	+ 1·6	+ 1·3	+ 1·1	+ 0·8	+ 0·5	+ 0·2	56	0
1·3	0·5	0·5	1·3	1·8	2·0	2·2	2·2	2·1	1·9	1·7	1·6	1·4	1·2	0·9	0·8	0·6	0·3	0·1		15
0·8	0·4	0·4	0·8	1·2	1·3	1·5	1·5	1·4	1·3	1·1	1·1	0·9	0·8	0·6	0·6	0·4	0·2	0·1		30
0·4	0·2	0·2	0·4	0·6	0·6	0·8	0·8	0·7	0·7	0·6	0·6	0·5	0·4	0·3	0·3	0·2	0·1	0·0		45
− 0·0	− 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	+ 0·0	57	0
+ 0·3	+ 0·1	− 0·1	− 0·3	− 0·4	− 0·5	− 0·6	− 0·6	− 0·6	− 0·6	− 0·5	− 0·5	− 0·4	− 0·4	− 0·3	− 0·2	− 0·2	− 0·1	− 0·0		15
0·7	0·3	0·3	0·7	0·9	1·0	1·1	1·1	1·1	1·1	1·0	1·0	0·9	1·8	0·6	0·5	0·4	0·2	0·0		30
1·0	0·4	0·4	1·0	1·3	1·5	1·6	1·7	1·7	1·7	1·6	1·5	1·4	1·2	0·9	0·7	0·6	0·4	0·1		45
+ 1·3	+ 0·5	− 0·5	− 1·3	− 1·8	− 2·0	− 2·1	− 2·2	− 2·2	− 2·2	− 2·1	− 2·0	− 1·9	− 1·6	− 1·3	− 1·0	− 0·7	− 0·5	− 0·1	58	0
1·6	0·6	0·6	1·6	2·2	2·5	2·7	2·8	2·8	2·8	2·6	2·5	2·4	2·0	1·6	1·2	0·9	0·6	0·2		15
1·9	0·8	0·8	1·9	2·7	3·0	3·2	3·3	3·3	3·3	3·2	3·0	2·9	2·4	2·0	1·5	1·1	0·7	0·2		30
2·2	0·9	0·9	2·2	3·1	3·5	3·8	3·9	3·9	3·9	3·7	3·5	3·4	2·8	2·3	1·7	1·3	0·8	0·3		45
+ 2·5	+ 1·0	− 1·0	− 2·5	− 3·5	− 4·0	− 4·3	− 4·4	− 4·4	− 4·4	− 4·3	− 4·1	− 3·8	− 3·3	− 2·7	− 2·0	− 1·4	− 1·0	− 0·4	59	0
2·8	1·1	1·1	2·8	4·0	4·5	4·9	5·0	5·0	5·0	4·8	4·6	4·3	3·7	3·0	2·2	1·6	1·1	0·4		15
3·2	1·3	1·3	3·2	4·4	5·0	5·4	5·5	5·5	5·5	5·4	5·1	4·8	4·1	3·4	2·5	1·8	1·2	0·5		30
3·5	1·4	1·4	3·5	4·9	5·5	6·0	6·1	6·1	6·1	5·9	5·6	5·3	4·5	3·7	2·7	2·0	1·3	0·6		45
+ 3·8	+ 1·5	− 1·5	− 3·8	− 5·3	− 6·0	− 6·5	− 6·6	− 6·6	− 6·6	− 6·5	− 6·2	− 5·7	− 5·0	− 4·1	− 3·0	− 2·1	− 1·4	− 0·7	60	0
4·1	1·6	1·6	4·1	5·7	6·5	7·1	7·2	7·2	7·2	7·0	6·7	6·2	5·4	4·4	3·2	2·3	1·5	0·7		15
4·4	1·8	1·8	4·4	6·2	7·0	7·6	7·7	7·7	7·7	7·6	7·2	6·7	5·8	4·8	3·5	2·5	1·6	0·8		30
4·7	1·9	1·9	4·7	6·6	7·5	8·1	8·3	8·3	8·3	8·1	7·7	7·2	6·2	5·1	3·8	2·7	1·7	0·9		45
+ 5·0	+ 2·0	− 2·0	− 5·0	− 7·0	− 8·0	− 8·6	− 8·8	− 8·9	− 8·8	− 8·7	− 8·3	− 7·6	− 6·7	− 5·5	− 4·1	− 2·8	− 1·8	− 1·0	61	0
5·3	2·1	2·1	5·1	7·5	8·5	9·1	9·4	9·4	9·4	9·2	8·8	8·1	7·1	5·9	4·4	3·0	2·0	1·1		15

Example.—Moon's Apparent Transit 3h 0m and H. P. 59′ 15″; correction = + 4m·3.

TABLES NOS. 3–4.—Corrections to Times of High Water for Sun's H. P., Declination, and

Date		0h			1h			2h			3h			4h			5h		
		0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m
		m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Jan.	1	+ 3·5	+ 3·8	+ 4·0	+ 4·3	+ 4·6	+ 4·9	+ 5·1	+ 5·4	+ 5·6	+ 5·9	+ 6·1	+ 6·3	+ 6·5	+ 6·6	+ 6·5	+ 6·2	+ 5·7	+ 5·2
	6	5·9	6·1	6·3	6·5	6·7	6·9	7·0	7·2	7·4	7·5	7·7	7·8	8·0	8·1	8·0	7·9	7·6	7·4
	11	8·1	8·2	8·4	8·5	8·6	8·7	8·8	8·9	9·0	9·1	9·2	9·3	9·4	9·5	9·5	9·4	9·3	9·2
	16	+ 10·0	+ 10·0	+ 10·2	+ 10·2	+ 10·3	+ 10·3	+ 10·4	+ 10·5	+ 10·5	+ 10·6	+ 10·7	+ 10·8	+ 10·8	+ 10·8	+ 10·8	+ 10·7	+ 10·7	+ 10·6
	21	11·7	11·7	11·7	11·7	11·7	11·7	11·7	11·8	11·8	11·8	11·8	11·9	11·9	11·9	11·9	11·9	11·8	11·8
	26	13·9	12·9	12·9	13·0	13·0	13·0	13·0	13·0	13·1	13·1	13·0	13·0	12·7	12·6	12·6	12·6	12·7	12·7
	31	+ 13·7	+ 13·8	+ 13·8	+ 13·9	+ 13·9	+ 14·0	+ 14·0	+ 14·0	+ 14·1	+ 14·1	+ 14·0	+ 13·7	+ 13·2	+ 13·0	+ 13·0	+ 13·1	+ 13·2	+ 13·3
Feb.	5	14·4	14·4	14·2	14·2	14·1	14·1	14·0	13·9	13·9	13·8	13·7	13·5	13·2	13·1	13·1	13·1	13·2	13·4
	10	14·8	14·6	14·4	14·2	14·0	13·8	13·7	13·6	13·4	13·3	13·1	13·0	12·9	12·8	12·8	12·9	13·0	13·3
	15	+ 14·8	+ 14·5	+ 14·3	+ 14·0	+ 13·7	+ 13·5	+ 13·3	+ 13·2	+ 13·0	+ 12·8	+ 12·6	+ 12·5	+ 12·3	+ 12·2	+ 12·2	+ 12·3	+ 12·5	+ 12·9
	20	14·4	14·1	13·7	13·4	13·1	12·8	12·6	12·4	12·2	12·0	11·8	11·6	11·4	11·3	11·3	11·4	11·7	12·1
	25	13·9	13·5	13·1	12·7	12·4	12·1	11·9	11·6	11·4	11·1	10·9	10·6	10·3	10·2	10·2	10·3	10·7	11·1
March	2	+ 13·0	+ 12·5	+ 12·1	+ 11·6	+ 11·3	+ 11·0	+ 10·8	+ 10·5	+ 10·2	+ 9·9	+ 9·6	+ 9·3	+ 9·0	+ 8·9	+ 8·9	+ 9·0	+ 9·4	+ 9·9
	7	11·9	11·4	11·0	10·5	10·2	9·9	9·7	9·4	9·1	8·8	8·5	8·2	7·9	7·8	7·8	7·9	8·3	8·8
	12	10·5	10·1	9·7	9·3	8·9	8·6	8·4	8·2	7·9	7·6	7·3	7·0	6·7	6·6	6·6	6·7	7·0	7·6
	17	+ 9·0	+ 8·7	+ 8·3	+ 8·0	+ 7·6	+ 7·3	+ 7·1	+ 6·9	+ 6·6	+ 6·3	+ 6·0	+ 5·8	+ 5·5	+ 5·4	+ 5·4	+ 5·5	+ 5·8	+ 6·4
	22	7·4	7·1	6·9	6·6	6·3	6·0	5·8	5·6	5·3	5·0	4·7	4·5	4·3	4·2	4·2	4·3	4·6	5·1
	27	5·8	5·5	5·3	5·0	4·8	4·6	4·4	4·2	4·0	3·8	3·6	3·4	3·2	3·1	3·1	3·2	3·4	3·7
April	1	+ 4·2	+ 4·0	+ 3·8	+ 3·6	+ 3·4	+ 3·3	+ 3·2	+ 3·0	+ 2·9	+ 2·7	+ 2·6	+ 2·4	+ 2·2	+ 2·1	+ 2·1	+ 2·2	+ 2·3	+ 2·5
	6	2·6	2·5	2·3	2·2	2·1	2·0	1·9	1·8	1·8	1·7	1·6	1·5	1·4	1·3	1·3	1·4	1·4	1·6
	11	1·1	1·0	1·0	0·9	0·9	0·9	0·8	0·8	0·8	0·8	0·7	0·7	0·7	0·7	0·7	0·7	0·7	0·8
	16	− 0·4	− 0·3	− 0·3	− 0·2	− 0·1	+ 0·0	+ 0·0	+ 0·0	+ 0·1	+ 0·1	+ 0·1	+ 0·1	+ 0·1	+ 0·1	+ 0·1	+ 0·1	+ 0·0	− 0·1
	21	1·6	1·5	1·3	1·2	1·0	− 0·8	− 0·7	− 0·6	− 0·5	− 0·5	− 0·4	− 0·4	− 0·3	− 0·3	− 0·3	− 0·4	− 0·5	0·7
	26	2·6	2·4	2·2	2·0	1·8	1·6	1·5	1·3	1·2	1·1	0·9	0·8	0·6	0·5	0·5	0·6	0·7	1·0
May	1	− 3·5	− 3·2	− 3·0	− 2·7	− 2·5	− 2·3	− 2·2	− 2·0	− 1·8	− 1·6	− 1·4	− 1·2	− 0·9	− 0·7	− 0·7	− 0·8	− 0·9	− 1·1
	6	4·1	3·8	3·4	3·1	2·8	2·6	2·4	2·2	1·9	1·7	1·4	1·2	0·8	0·6	0·6	0·7	0·8	1·1
	11	4·4	4·0	3·6	3·2	2·9	2·6	2·4	2·1	1·8	1·5	1·2	0·9	0·4	0·2	0·2	0·3	0·5	0·8
	16	− 4·5	− 4·1	− 3·7	− 3·3	− 2·9	− 2·6	− 2·3	− 2·0	− 1·6	− 1·2	− 0·8	− 0·4	+ 0·1	+ 0·3	+ 0·3	+ 0·1	− 0·1	− 0·5
	21	4·3	3·9	3·5	3·1	2·6	2·3	2·0	1·6	1·2	0·7	0·2	+ 0·3	0·8	1·0	1·0	0·8	+ 0·6	+ 0·1
	26	3·8	3·4	3·0	2·6	2·1	1·7	1·4	0·9	0·4	+ 0·2	+ 0·7	1·2	1·7	2·0	2·0	1·8	1·5	0·9
	31	− 3·2	− 2·8	− 2·4	− 2·0	− 1·6	− 1·1	− 0·7	− 0·1	+ 0·4	+ 1·1	+ 1·7	+ 2·2	+ 2·7	+ 3·0	+ 3·0	+ 2·8	+ 2·4	+ 1·8
June	5	2·5	2·0	1·6	1·1	0·7	0·2	+ 0·3	+ 1·0	1·5	2·3	2·9	3·5	4·0	4·3	4·3	4·1	3·6	2·0
	10	1·6	1·1	0·7	0·2	+ 0·3	+ 0·9	1·4	2·1	2·7	3·5	4·2	4·8	5·4	5·7	5·7	5·5	4·9	4·1
	15	− 0·7	− 0·2	+ 0·4	+ 0·9	+ 1·5	+ 2·1	+ 2·8	+ 3·5	+ 4·2	+ 5·1	+ 5·8	+ 6·3	+ 6·9	+ 7·1	+ 7·1	+ 6·9	+ 6·2	+ 5·2
	20	+ 0·3	+ 0·9	1·5	2·1	2·8	3·5	4·3	5·0	5·8	6·7	7·4	7·9	8·4	8·6	8·6	8·3	7·5	6·4
	25	1·3	1·9	2·7	3·3	4·0	4·7	5·5	6·2	7·0	7·9	8·6	9·1	9·6	9·8	9·8	9·5	8·7	7·6
	30	+ 2·2	+ 2·9	+ 3·7	+ 4·4	+ 5·1	+ 5·8	+ 6·6	+ 7·3	+ 8·1	+ 9·0	+ 9·7	+ 10·2	+ 10·7	+ 10·9	+ 10·9	+ 10·6	+ 9·8	+ 8·7
July	5	3·1	3·8	4·6	5·3	6·0	6·6	7·4	8·1	8·9	9·7	10·4	10·9	11·4	11·5	11·5	11·3	10·5	9·4

Example.—January 26th and Moon's Apparent Transit $5^h\ 40^m$; correction = + $12^m \cdot 7$.

Equation of Time (Apparent to Mean). Arguments—Day of Year and Moon's Apparent Transit.

6h			7h			8h			9h			10h			11h				Date
0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	60m	
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
+ 4·6	+ 4·2	+ 3·6	+ 3·2	+ 2·6	+ 2·1	+ 1·6	+ 1·3	+ 1·2	+ 1·3	+ 1·5	+ 1·7	+ 1·9	+ 2·2	+ 2·4	+ 2·7	+ 2·9	+ 3·2	+ 3·5	Jan. 1
6·9	6·5	5·9	5·5	5·0	4·8	4·5	4·3	4·3	4·4	4·6	4·7	4·9	5·0	5·2	5·4	5·5	5·7	5·9	6
8·9	8·5	8·1	7·7	7·4	7·3	7·2	7·1	7·1	7·2	7·3	7·4	7·5	7·6	7·7	7·8	7·9	8·0	8·1	11
+10·5	+10·2	+10·0	+ 9·7	+ 9·6	+ 9·5	+ 9·5	+ 9·4	+ 9·4	+ 9·4	+ 9·4	+ 9·5	+ 9·6	+ 9·7	+ 9·7	+ 9·8	+ 9·9	+ 9·9	+10·0	16
11·8	11·7	11·7	11·6	11·6	11·6	11·5	11·5	11·5	11·5	11·5	11·6	11·6	11·6	11·6	11·7	11·7	11·7	11·7	21
12·8	12·8	13·0	13·0	13·1	13·2	13·2	13·2	13·2	13·1	13·0	12·8	12·7	12·7	12·7	12·8	12·8	12·8	12·8	26
+13·4	+13·6	+14·0	+14·2	+14·3	+14·4	+14·5	+14·6	+14·6	+14·3	+13·9	+13·6	+13·5	+13·5	+13·6	+13·6	+13·6	+13·7	+13·7	31
13·7	14·0	14·6	14·9	15·2	15·4	15·5	15·6	15·6	15·4	15·2	15·0	14·9	14·8	14·7	14·6	14·6	14·5	14·4	Feb. 5
13·7	14·2	14·8	15·3	15·7	16·0	16·1	16·2	16·2	16·1	16·0	15·9	15·7	15·6	15·4	15·3	15·2	15·0	14·8	10
+13·3	+14·0	+14·8	+15·5	+15·9	+16·3	+16·5	+16·6	+16·6	+16·5	+16·3	+16·2	+16·0	+15·8	+15·6	+15·5	+15·3	+15·1	+14·8	15
12·6	13·4	14·4	15·2	15·7	16·1	16·4	16·5	16·5	16·4	16·2	16·0	15·8	15·6	15·4	15·2	15·0	14·7	14·4	20
11·8	12·7	13·9	14·8	15·5	15·9	16·3	16·4	16·4	16·3	16·0	15·7	15·5	15·2	15·0	14·7	14·5	14·2	13·9	25
+10·6	+11·6	+13·0	+14·0	+14·7	+15·2	+15·6	+15·7	+15·7	+15·6	+15·3	+15·0	+14·7	+14·4	+14·1	+13·8	+13·6	+13·3	+13·0	Mar. 2
9·6	10·5	11·9	12·8	13·6	14·1	14·5	14·6	14·6	14·5	14·2	13·9	13·6	13·3	13·0	12·7	12·5	12·2	11·9	7
8·3	9·2	10·6	11·5	12·2	12·8	13·1	13·2	13·2	13·1	12·8	12·5	12·2	11·9	11·6	11·4	11·2	10·9	10·5	12
+ 7·0	+ 7·9	+ 9·1	+10·0	+10·6	+11·2	+11·5	+11·6	+11·6	+11·5	+11·2	+11·0	+10·7	+10·4	+10·1	+ 9·9	+ 9·7	+ 9·4	+ 9·0	17
5·7	6·5	7·5	8·3	8·9	9·4	9·7	9·8	9·8	9·7	9·5	9·3	9·0	8·7	8·4	8·2	8·0	7·7	7·4	22
4·2	4·9	5·9	6·6	7·1	7·4	7·6	7·7	7·7	7·6	7·4	7·2	7·0	6·8	6·6	6·4	6·2	6·0	5·8	27
+ 2·9	+ 3·5	+ 4·3	+ 4·9	+ 5·3	+ 5·5	+ 5·6	+ 5·7	+ 5·7	+ 5·6	+ 5·4	+ 5·2	+ 5·1	+ 4·9	+ 4·8	+ 4·6	+ 4·5	+ 4·4	+ 4·2	Ap. 1
1·8	2·1	2·7	3·0	3·2	3·4	3·4	3·5	3·5	3·4	3·3	3·2	3·1	3·0	3·0	2·9	2·8	2·7	2·6	6
0·8	0·9	1·1	1·2	1·2	1·3	1·3	1·3	1·3	1·3	1·3	1·3	1·2	1·2	1·2	1·2	1·1	1·1	1·1	11
− 0·1	− 0·2	− 0·4	− 0·5	− 0·5	− 0·6	− 0·7	− 0·7	− 0·7	− 0·7	− 0·7	− 0·7	− 0·7	− 0·6	− 0·6	− 0·6	− 0·5	− 0·4	− 0·4	16
0·9	1·2	1·6	1·9	2·1	2·3	2·4	2·5	2·5	2·5	2·4	2·4	2·3	2·3	2·2	2·1	2·0	1·8	1·6	21
1·2	1·9	2·7	3·4	3·6	3·9	4·0	4·1	4·1	4·0	3·8	3·7	3·5	3·4	3·3	3·1	3·0	2·8	2·6	26
− 1·5	− 2·4	− 3·8	− 4·7	− 5·1	− 5·3	− 5·4	− 5·5	− 5·5	− 5·3	− 5·0	− 4·8	− 4·6	− 4·4	− 4·2	− 4·0	− 3·9	− 3·7	− 3·5	May 1
1·6	2·7	4·5	5·6	6·1	6·4	6·5	6·6	6·6	6·4	6·0	5·8	5·5	5·3	5·0	4·8	4·6	4·4	4·1	6
1·4	2·8	4·8	6·2	6·8	7·1	7·3	7·4	7·4	7·2	6·7	6·4	6·1	5·8	5·5	5·2	5·0	4·7	4·4	11
− 1·2	− 2·7	− 5·1	− 6·6	− 7·3	− 7·7	− 7·9	− 8·1	− 8·1	− 7·9	− 7·4	− 7·0	− 6·6	− 6·2	− 5·8	− 5·5	− 5·2	− 4·9	− 4·5	16
0·8	2·4	5·0	6·6	7·5	8·0	8·2	8·4	8·4	8·2	7·7	7·2	6·7	6·2	5·8	5·4	5·1	4·8	4·3	21
0·1	1·8	4·6	6·3	7·3	7·9	8·2	8·4	8·4	8·1	7·6	7·1	6·6	6·0	5·5	5·0	4·7	4·3	3·8	26
+ 0·7	− 1·2	− 4·0	− 5·9	− 7·0	− 7·6	− 8·0	− 8·2	− 8·2	− 7·9	− 7·4	− 6·9	− 6·3	− 5·6	− 5·1	− 4·5	− 4·1	− 3·6	− 3·2	31
1·7	0·3	3·3	5·3	6·5	7·2	7·7	7·9	7·9	7·6	7·1	6·5	5·9	5·1	4·6	3·9	3·4	2·9	2·5	June 5
2·8	+ 0·7	2·5	4·6	5·9	6·7	7·3	7·5	7·5	7·2	6·6	6·0	5·3	4·5	3·9	3·2	2·7	2·1	1·6	10
+ 3·8	+ 1·7	− 1·5	− 3·6	− 5·0	− 6·0	− 6·7	− 6·9	− 6·9	− 6·7	− 6·1	− 5·6	− 4·9	− 4·0	− 3·3	− 2·6	− 1·9	− 1·3	− 0·7	15
4·9	2·8	0·4	2·5	4·0	5·1	5·9	6·2	6·2	6·0	5·5	5·0	4·3	3·4	2·6	1·9	1·1	0·4	+ 0·3	20
6·1	3·9	+ 0·7	1·5	3·0	4·1	4·9	5·2	5·2	5·0	4·5	4·0	3·3	2·4	1·6	0·9	0·1	+ 0·6	1·3	25
+ 7·1	+ 4·9	+ 1·7	− 0·5	− 2·1	− 3·2	− 4·0	− 4·3	− 4·3	− 4·1	− 3·6	− 3·1	− 2·4	− 1·5	− 0·7	+ 0·0	+ 0·8	+ 1·5	+ 2·2	30
7·9	5·8	2·6	+ 0·5	1·0	2·1	2·9	3·1	3·1	3·0	2·5	2·0	1·3	0·5	+ 0·3	1·0	1·8	2·4	3·1	July 5

Example.—January 26th and Moon's Apparent Transit $5^h\ 40^m$; correction = $+ 12^m{\cdot}7$.

Tables Nos. 3-4.—Corrections to Times of High Water for Sun's H. P., Declination, and

Date		0h			1h			2h			3h			4h			5h		
		0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m	0m	20m	40m
		m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
July	5	+ 3·1	+ 3·8	+ 4·6	+ 5·3	+ 6·0	+ 6·6	+ 7·4	+ 8·1	+ 8·9	+ 9·7	+ 10·4	+ 10·9	+ 11·4	+ 11·5	+ 11·5	+ 11·3	+ 10·5	+ 9·4
	10	4·0	4·6	5·4	6·0	6·7	7·3	8·1	8·7	9·5	10·3	11·0	11·4	11·9	12·0	12·0	11·8	11·1	10·0
	15	4·6	5·3	5·9	6·6	7·2	7·8	8·5	9·1	9·8	10·6	11·2	11·6	12·1	12·1	12·1	12·0	11·3	10·3
	20	+ 5·1	+ 5·7	+ 6·3	+ 6·9	+ 7·5	+ 8·1	+ 8·7	+ 9·2	+ 9·9	+ 10·6	+ 11·1	+ 11·5	+ 12·0	+ 12·0	+ 12·0	+ 11·9	+ 11·2	+ 10·3
	25	5·4	6·0	6·4	7·0	7·5	8·0	8·4	8·9	9·5	10·1	10·5	10·9	11·4	11·6	11·6	11·4	10·8	10·1
	30	5·4	5·9	6·3	6·8	7·2	7·5	7·8	8·2	8·7	9·2	9·6	10·0	10·5	10·8	10·8	10·6	10·1	9·5
Aug.	4	+ 5·1	+ 5·6	+ 6·0	+ 6·5	+ 6·8	+ 7·1	+ 7·3	+ 7·7	+ 8·1	+ 8·5	+ 8·8	+ 9·2	+ 9·7	+ 10·0	+ 10·0	+ 9·8	+ 9·4	+ 9·0
	9	4·6	5·0	5·4	5·8	6·1	6·4	6·6	6·9	7·2	7·5	7·8	8·1	8·6	8·8	8·8	8·7	8·5	8·2
	14	3·9	4·3	4·5	4·9	5·2	5·4	5·6	5·8	6·1	6·3	6·6	6·8	7·2	7·4	7·4	7·3	7·1	6·9
	19	+ 3·0	+ 3·3	+ 3·5	+ 3·8	+ 4·0	+ 4·2	+ 4·3	+ 4·5	+ 4·7	+ 4·9	+ 5·1	+ 5·3	+ 5·6	+ 5·8	+ 5·8	+ 5·7	+ 5·6	+ 5·4
	24	1·9	2·1	2·3	2·5	2·7	2·8	2·9	3·1	3·2	3·4	3·5	3·7	3·9	4·0	4·0	3·9	3·8	3·6
	29	0·5	0·6	0·8	0·9	1·0	1·1	1·2	1·3	1·4	1·5	1·6	1·7	1·8	1·9	1·9	1·8	1·6	1·4
Sept.	3	− 0·9	− 0·8	− 0·8	− 0·7	− 0·6	− 0·6	− 0·5	− 0·4	− 0·4	− 0·3	− 0·3	− 0·2	− 0·2	− 0·1	− 0·1	− 0·2	− 0·4	− 0·4
	8	2·5	2·5	2·5	2·5	2·4	2·4	2·4	2·4	2·4	2·4	2·3	2·3	2·3	2·3	2·3	2·3	2·3	2·4
	13	4·1	4·2	4·2	4·3	4·3	4·3	4·3	4·4	4·4	4·4	4·5	4·5	4·5	4·6	4·6	4·5	4·5	4·4
	18	− 5·8	− 5·9	− 6·1	− 6·2	− 6·3	− 6·3	− 6·4	− 6·4	− 6·5	− 6·6	− 6·7	− 6·7	− 6·8	− 6·9	− 6·9	− 6·8	− 6·7	− 6·5
	23	7·5	7·6	7·8	7·9	8·1	8·2	8·3	8·4	8·5	8·6	8·8	8·8	9·0	9·1	9·1	9·0	8·8	8·5
	28	9·1	9·3	9·5	9·7	9·9	10·0	10·2	10·3	10·5	10·6	10·8	10·9	11·1	11·2	11·2	11·1	10·8	10·5
Oct.	3	− 10·7	− 10·9	− 11·1	− 11·3	− 11·5	− 11·7	− 11·8	− 12·0	− 12·2	− 12·3	− 12·5	− 12·7	− 12·9	− 13·0	− 13·0	− 12·9	− 12·5	− 12·2
	8	12·2	12·4	12·6	12·8	13·1	13·2	13·3	13·6	13·8	13·9	14·1	14·3	14·5	14·6	14·6	14·5	14·1	13·8
	13	13·4	13·6	13·8	14·0	14·3	14·4	14·5	14·8	15·0	15·1	15·3	15·5	15·7	15·8	15·8	15·7	15·3	15·0
	18	− 14·5	− 14·7	− 14·9	− 15·1	− 15·4	− 15·5	− 15·6	− 15·9	− 16·1	− 16·2	− 16·4	− 16·6	− 16·8	− 16·9	− 16·9	− 16·8	− 16·4	− 16·1
	23	15·3	15·5	15·7	15·9	16·1	16·3	16·4	16·6	16·8	16·9	17·1	17·3	17·5	17·6	17·6	17·5	17·1	16·8
	28	15·8	16·0	16·2	16·4	16·6	16·7	16·9	17·0	17·2	17·3	17·5	17·6	17·8	17·9	17·9	17·8	17·5	17·2
Nov.	2	− 16·0	− 16·2	− 16·4	− 16·6	− 16·7	− 16·8	− 16·9	− 17·0	− 17·1	− 17·2	− 17·4	− 17·4	− 17·6	− 17·7	− 17·7	− 17·6	− 17·4	− 17·1
	7	16·0	16·1	16·3	16·4	16·5	16·5	16·6	16·6	16·7	16·8	16·9	16·9	17·0	17·1	17·1	17·0	16·9	16·7
	12	15·6	15·7	15·7	15·8	15·8	15·8	15·9	15·9	15·9	15·9	15·9	15·9	15·9	16·0	16·0	16·0	16·0	15·9
	17	− 14·9	− 14·8	− 14·8	− 14·7	− 14·7	− 14·7	− 14·7	− 14·7	− 14·6	− 14·6	− 14·6	− 14·6	− 14·5	− 14·5	− 14·5	− 14·5	− 14·6	− 14·6
	22	13·9	13·8	13·6	13·5	13·4	13·4	13·3	13·2	13·1	13·0	12·9	12·9	12·8	12·7	12·7	12·8	12·9	13·1
	27	12·4	12·2	12·0	11·8	11·7	11·6	11·4	11·3	11·1	11·0	10·8	10·7	10·6	10·5	10·5	10·6	10·8	11·1
Dec.	2	− 10·7	− 10·5	− 10·1	− 9·9	− 9·7	− 9·5	− 9·3	− 9·1	− 8·9	− 8·8	− 8·6	− 8·4	− 8·3	− 8·2	− 8·2	− 8·3	− 8·5	− 8·9
	7	8·8	8·5	8·1	7·8	7·5	7·2	7·0	6·8	6·6	6·4	6·2	6·0	5·8	5·7	5·7	5·8	6·1	6·5
	12	6·5	6·2	5·8	5·5	5·2	4·9	4·7	4·4	4·1	3·8	3·5	3·2	3·0	2·9	2·9	3·1	3·5	3·9
	17	− 4·1	− 3·8	− 3·4	− 3·1	− 2·8	− 2·5	− 2·3	− 2·0	− 1·6	− 1·2	− 0·9	− 0·6	− 0·4	− 0·3	− 0·3	− 0·5	− 0·9	− 1·4
	22	1·5	1·2	1·0	0·7	0·4	0·1	+ 0·2	+ 0·6	+ 1·0	+ 1·4	+ 1·7	+ 2·0	+ 2·2	+ 2·3	+ 2·3	+ 2·0	+ 1·6	+ 1·1
	27	+ 1·0	+ 1·3	+ 1·5	+ 1·8	+ 2·1	+ 2·4	2·7	3·1	3·5	3·9	4·2	4·5	4·7	4·8	4·8	4·5	4·1	3·6
	32	+ 3·4	+ 3·7	+ 3·9	+ 4·2	+ 4·5	+ 4·7	+ 4·9	+ 5·3	+ 5·5	+ 5·9	+ 6·2	+ 6·5	+ 6·6	+ 6·7	+ 6·7	+ 6·5	+ 6·1	+ 5·7

Example.—January 26th and Moon's Apparent Transit $5^h\ 40^m$; correction = + $12^m{\cdot}7$.

Equation of Time (Apparent to Mean). Arguments—Day of Year and Moon's Apparent Transit.

6h 0m	6h 20m	6h 40m	7h 0m	7h 20m	7h 40m	8h 0m	8h 20m	8h 40m	9h 0m	9h 20m	9h 40m	10h 0m	10h 20m	10h 40m	11h 0m	11h 20m	11h 40m	11h 60m	Date
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
+ 7·9	+ 5·8	+ 2·6	+ 0·5	− 1·1	− 2·1	− 2·9	− 3·1	− 3·1	− 3·0	− 2·5	− 2·0	− 1·3	− 0·5	+ 0·3	+ 1·0	+ 1·8	+ 2·4	+ 3·1	July 5
8·6	6·5	3·5	1·4	0·0	1·1	1·8	2·0	2·0	1·9	1·4	1·0	0·3	+ 0·5	1·3	1·9	2·7	3·3	4·0	10
9·0	7·0	4·2	2·2	+ 0·9	0·1	0·8	0·9	0·9	0·9	0·4	0·0	+ 0·6	1·4	2·1	2·7	3·4	4·0	4·6	15
+ 9·1	+ 7·3	+ 4·7	+ 2·9	+ 1·7	+ 0·8	+ 0·1	0·0	0·0	0·0	+ 0·5	+ 0·9	+ 1·4	+ 2·1	+ 2·8	+ 3·3	+ 3·9	+ 4·5	+ 5·1	20
9·0	7·4	5·0	3·4	2·3	1·6	1·0	+ 0·8	+ 0·8	+ 1·0	1·5	1·9	2·3	2·9	3·5	4·0	4·4	4·9	5·4	25
8·7	7·2	5·0	3·5	2·7	2·1	1·6	1·4	1·4	1·7	2·2	2·6	3·0	3·5	4·0	4·4	4·7	5·0	5·4	30
+ 8·3	+ 6·9	+ 4·7	+ 3·3	+ 2·6	+ 2·2	+ 1·8	+ 1·6	+ 1·6	+ 1·9	+ 2·4	+ 2·8	+ 3·1	+ 3·5	+ 3·9	+ 4·3	+ 4·5	+ 4·8	+ 5·1	Aug. 4
7·6	6·2	4·2	2·8	2·2	1·9	1·7	1·6	1·6	1·8	2·3	2·6	2·9	3·2	3·5	3·8	4·0	4·3	4·6	9
6·4	5·3	3·5	2·4	1·9	1·7	1·5	1·4	1·4	1·6	2·0	2·2	2·5	2·7	3·0	3·2	3·4	3·6	3·9	14
+ 5·0	+ 4·1	+ 2·7	+ 1·8	+ 1·4	+ 1·2	+ 1·1	+ 1·0	+ 1·0	+ 1·2	+ 1·5	+ 1·7	+ 1·9	+ 2·1	+ 2·3	+ 2·5	+ 2·6	+ 2·8	+ 3·0	19
3·3	2·7	1·7	1·1	0·8	0·6	0·5	0·4	0·4	0·5	0·7	0·9	1·0	1·2	1·3	1·5	1·6	1·7	1·9	24
1·2	0·9	0·5	0·2	0·0	− 0·2	− 0·4	− 0·5	− 0·5	− 0·4	− 0·3	− 0·2	− 0·1	0·0	0·1	0·2	0·3	0·4	0·5	29
− 0·5	− 0·7	− 0·9	− 1·1	− 1·2	− 1·2	− 1·4	− 1·5	− 1·5	− 1·4	− 1·4	− 1·3	− 1·3	− 1·2	− 1·2	− 1·1	− 1·0	− 1·0	− 0·9	Sep. 3
2·4	2·5	2·5	2·6	2·6	2·7	2·7	2·7	2·7	2·7	2·7	2·7	2·6	2·6	2·6	2·6	2·6	2·6	2·5	8
4·3	4·2	4·2	4·1	4·0	3·9	3·9	3·8	3·8	3·9	3·9	3·9	4·0	4·0	4·0	4·1	4·1	4·1	4·1	13
− 6·3	− 6·1	− 5·9	− 5·7	− 5·5	− 5·3	− 5·2	− 5·1	− 5·1	− 5·2	− 5·3	− 5·3	− 5·4	− 5·5	− 5·6	− 5·6	− 5·7	− 5·7	− 5·8	18
8·2	7·9	7·5	7·2	6·9	6·6	6·4	6·3	6·3	6·4	6·6	6·6	6·8	6·9	7·0	7·1	7·2	7·3	7·5	23
10·1	9·7	9·1	8·7	8·3	8·0	7·7	7·6	7·6	7·7	7·9	8·0	8·2	8·3	8·5	8·6	8·8	8·9	9·1	28
− 11·8	− 11·3	− 10·7	− 10·2	− 9·8	− 9·5	− 9·1	− 9·0	− 9·0	− 9·1	− 9·3	− 9·5	− 9·7	− 9·8	− 10·0	− 10·2	− 10·3	− 10·5	− 10·7	Oct. 3
13·3	12·8	12·2	11·7	11·2	10·9	10·5	10·4	10·4	10·5	10·7	10·9	11·1	11·2	11·4	11·7	11·8	11·9	12·2	8
14·5	14·0	13·4	12·9	12·4	12·1	11·7	11·6	11·6	11·7	11·9	12·2	12·3	12·4	12·6	12·9	13·0	13·1	13·4	13
− 15·6	− 15·1	− 14·5	− 14·0	− 13·5	− 13·2	− 12·8	− 12·7	− 12·7	− 12·8	− 13·0	− 13·2	− 13·4	− 13·5	− 13·7	− 14·0	− 14·1	− 14·2	− 14·5	18
16·3	15·9	15·3	14·9	14·4	14·1	13·7	13·6	13·6	13·7	13·9	14·1	14·3	14·4	14·6	14·8	14·9	15·1	15·3	23
16·8	16·4	15·8	15·4	15·0	14·7	14·4	14·3	14·3	14·4	14·6	14·7	14·9	15·0	15·2	15·3	15·5	15·6	15·8	28
− 16·8	− 16·5	− 16·1	− 15·8	− 15·5	− 15·2	− 15·0	− 14·9	− 14·9	− 15·0	− 15·2	− 15·2	− 15·4	− 15·5	− 15·6	− 15·7	− 15·8	− 15·9	− 16·0	Nov. 2
16·5	16·3	16·1	15·9	15·7	15·5	15·4	15·3	15·3	15·4	15·5	15·5	15·6	15·7	15·8	15·8	15·9	15·9	16·0	7
15·8	15·8	15·6	15·6	15·5	15·4	15·4	15·4	15·4	15·5	15·5	15·5	15·5	15·5	15·5	15·5	15·6	15·6	15·6	12
− 14·7	− 14·8	− 14·8	− 14·9	− 15·0	− 15·0	− 15·1	− 15·1	− 15·1	− 15·1	− 15·0	− 15·0	− 15·0	− 15·0	− 14·9	− 14·9	− 14·9	− 14·9	− 14·9	17
13·4	13·6	13·8	14·0	14·3	14·5	14·6	14·7	14·7	14·6	14·5	14·5	14·4	14·3	14·2	14·1	14·0	14·0	13·9	22
11·5	11·8	12·4	12·7	13·1	13·4	13·6	13·7	13·7	13·6	13·5	13·4	13·2	13·1	12·9	12·8	12·6	12·5	12·4	27
− 9·3	− 9·9	− 10·7	− 11·3	− 11·7	− 12·1	− 12·3	− 12·4	− 12·4	− 12·3	− 12·2	− 12·0	− 11·8	− 11·7	− 11·5	− 11·3	− 11·1	− 10·9	− 10·7	Dec. 2
7·0	7·8	8·8	9·6	10·1	10·5	10·8	10·9	10·9	10·8	10·6	10·4	10·2	10·0	9·8	9·6	9·4	9·1	8·8	7
4·6	5·4	6·6	7·4	8·1	8·5	8·9	9·1	9·1	9·0	8·8	8·5	8·2	7·9	7·6	7·3	7·1	6·8	6·5	12
− 2·1	− 3·0	− 4·2	− 5·1	− 5·8	− 6·3	− 6·7	− 6·9	− 6·9	− 6·8	− 6·6	− 6·3	− 6·0	− 5·6	− 5·2	− 4·9	− 4·7	− 4·4	− 4·1	17
+ 0·4	0·5	1·7	2·6	3·3	3·8	4·2	4·5	4·5	4·4	4·2	3·9	3·6	3·2	2·8	2·4	2·1	1·8	1·5	22
2·9	+ 2·0	+ 0·8	0·1	0·8	1·3	1·7	2·0	2·0	1·9	1·7	1·4	1·1	0·7	0·3	+ 0·1	+ 0·4	+ 0·7	+ 1·0	27
+ 5·1	+ 4·3	+ 3·3	+ 2·5	+ 1·9	+ 1·5	+ 1·1	+ 0·9	+ 0·9	+ 1·0	+ 1·2	+ 1·4	+ 1·7	+ 2·0	+ 2·3	+ 2·7	+ 2·9	+ 3·1	+ 3·4	32

Example.—January 26th and Moon's Apparent Transit $5^h\ 40^m$; correction = + $12^m \cdot 7$.

TABLE No. 5.—Correction for Moon's Declination for London Heights. Applicable to Moon's Transit B. (or 4th previous).

Declination	0h 0m	0h 30m	1h 0m	1h 30m	2h 0m	2h 30m	3h 0m	3h 30m	4h 0m	4h 30m	5h 0m	5h 30m	6h 0m	6h 30m	7h 0m	7h 30m	8h 0m	8h 30m	9h 0m	9h 30m	10h 0m	10h 30m	11h 0m	11h 30m	Declination
°	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	°
0	+ ·32	+ ·32	+ ·32	+ ·31	+ ·31	+ ·31	+ ·30	+ ·30	+ ·30	+ ·30	+ ·30	+ ·31	+ ·31	+ ·31	+ ·31	+ ·31	+ ·30	+ ·30	+ ·30	+ ·30	+ ·30	+ ·31	+ ·31	+ ·31	0
1	·32	·32	·32	·31	·31	·31	·30	·30	·30	·30	·30	·31	·31	·31	·31	·31	·30	·30	·30	·30	·30	·31	·31	·31	1
2	·31	·31	·31	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	·30	2
3	·31	·31	·31	·30	·30	·30	·30	·30	·29	·29	·29	·30	·30	·30	·30	·30	·29	·29	·29	·29	·30	·30	·30	·30	3
4	·30	·30	·30	·30	·29	·29	·29	·29	·28	·28	·28	·28	·29	·29	·29	·29	·28	·28	·28	·28	·29	·29	·29	·29	4
5	·29	·29	·29	·29	·28	·28	·28	·28	·27	·27	·27	·27	·28	·28	·28	·28	·27	·27	·27	·27	·28	·28	·28	·28	5
6	·27	·27	·27	·27	·26	·26	·26	·26	·25	·25	·25	·25	·26	·26	·26	·26	·25	·25	·25	·25	·26	·26	·26	·26	6
7	·25	·25	·25	·25	·24	·24	·24	·24	·23	·23	·23	·23	·24	·24	·24	·24	·23	·23	·23	·23	·24	·24	·24	·24	7
8	·23	·23	·23	·23	·22	·22	·22	·22	·21	·21	·21	·21	·22	·22	·22	·22	·21	·21	·21	·21	·22	·22	·22	·22	8
9	·21	·21	·21	·21	·20	·20	·20	·20	·19	·19	·19	·19	·20	·20	·20	·20	·19	·19	·19	·19	·20	·20	·20	·20	9
10	·18	·18	·18	·18	·17	·17	·17	·17	·16	·16	·16	·16	·17	·17	·17	·17	·16	·16	·16	·16	·17	·17	·17	·17	10
11	·15	·15	·15	·15	·14	·14	·14	·14	·13	·13	·13	·13	·14	·14	·14	·14	·13	·13	·13	·13	·14	·14	·14	·14	11
12	·12	·12	·12	·12	·11	·11	·10	·10	·10	·10	·10	·10	·11	·11	·11	·11	·11	·11	·11	·11	·10	·10	·11	·11	12
13	·08	·08	·08	·08	·08	·08	·07	·07	·07	·07	·07	·07	·08	·08	·08	·08	·08	·08	·08	·08	·07	·07	·08	·08	13
14	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	14
15	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	15
16	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	− ·04	16
17	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	17
18	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	·13	18
19	·18	·18	·18	·18	·18	·18	·18	·18	·17	·17	·17	·17	·18	·18	·18	·18	·17	·17	·17	·17	·18	·18	·18	·18	19
20	·23	·23	·23	·23	·23	·23	·23	·23	·22	·22	·22	·22	·23	·23	·23	·23	·22	·22	·22	·22	·23	·23	·23	·23	20
21	·29	·29	·29	·29	·28	·28	·28	·28	·27	·27	·27	·27	·28	·28	·28	·28	·27	·27	·27	·27	·28	·28	·28	·28	21
22	·35	·35	·35	·35	·34	·34	·33	·33	·32	·32	·32	·32	·34	·34	·34	·33	·32	·32	·32	·32	·33	·33	·34	·34	22
23	·41	·41	·41	·41	·40	·40	·39	·39	·38	·38	·38	·39	·40	·40	·40	·39	·38	·38	·38	·38	·39	·39	·40	·40	23
24	·47	·47	·47	·47	·46	·46	·45	·45	·44	·44	·44	·45	·46	·46	·46	·45	·44	·44	·44	·44	·45	·45	·46	·46	24
25	·53	·53	·53	·53	·52	·52	·51	·50	·49	·49	·49	·50	·51	·51	·51	·50	·49	·49	·49	·50	·51	·51	·52	·52	25
26	·59	·59	·59	·59	·58	·58	·57	·56	·55	·55	·55	·56	·57	·57	·57	·56	·55	·55	·55	·56	·57	·57	·58	·58	26
27	·66	·66	·66	·66	·65	·64	·63	·62	·61	·61	·61	·62	·63	·63	·63	·62	·61	·61	·61	·62	·63	·64	·65	·65	27
28	·73	·73	·73	·73	·72	·71	·69	·68	·67	·67	·67	·68	·69	·69	·69	·68	·67	·67	·67	·68	·69	·71	·72	·72	28
29	·80	·80	·80	·79	·78	·77	·76	·75	·73	·73	·74	·75	·76	·76	·76	·75	·73	·73	·74	·75	·76	·78	·79	·79	29
30	·87	·87	·87	·86	·86	·85	·83	·81	·80	·80	·79	·81	·83	·83	·83	·81	·79	·80	·80	·81	·83	·85	·86	·86	30

Example.—Moon's Apparent Transit 2h 30m and Declination 25°; correction = − 0·52 feet.

TABLE No. 6.—Correction for Moon's H. P. for London Heights. Applicable to Moon's Transit B. (or 4th previous).

H. P. ′	″	0ʰ 0ᵐ	0ʰ 30ᵐ	1ʰ 0ᵐ	1ʰ 30ᵐ	2ʰ 0ᵐ	2ʰ 30ᵐ	3ʰ 0ᵐ	3ʰ 30ᵐ	4ʰ 0ᵐ	4ʰ 30ᵐ	5ʰ 0ᵐ	5ʰ 30ᵐ
		feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
53	50	− ·70	− ·70	− ·70	− ·69	− ·69	− ·68	− ·67	− ·66	− ·65	− ·66	− ·67	− ·68
54	0	·66	·66	·66	·65	·65	·64	·63	·62	·61	·62	·63	·64
	10	·62	·62	·62	·61	·61	·60	·59	·58	·57	·58	·59	− ·60
	20	·59	·59	·59	·58	·57	·56	·55	·54	·54	·54	·55	·56
	30	− ·56	− ·56	− ·56	− ·55	− ·54	− ·53	− ·52	− ·51	− ·51	− ·51	− ·52	− ·53
	40	·53	·53	·53	·52	·51	·50	·49	·48	·48	·48	·49	·50
	50	·49	·49	·49	·48	·48	·47	·46	·45	·45	·46	·46	·47
55	0	− ·45	− ·45	− ·45	− ·44	− ·44	− ·43	− ·43	− ·42	− ·42	− ·43	− ·43	− ·44
	10	·42	·42	·42	·41	·41	·40	·40	·39	·39	·40	·40	·41
	20	·39	·39	·39	·38	·38	·37	·37	·36	·36	·37	·37	·38
	30	− ·35	− ·35	− ·35	− ·35	− ·35	− ·34	− ·34	− ·33	− ·33	− ·34	− ·34	− ·35
	40	·31	·31	·31	·31	·31	·30	·30	·29	·29	·30	·30	·31
	50	·27	·27	·27	·27	·27	·26	·26	·25	·25	·26	·26	·27
56	0	− ·23	− ·23	− ·23	− ·23	− ·23	− ·22	− ·22	− ·21	− ·21	− ·22	− ·22	− ·23
	10	·20	·20	·20	·20	·20	·19	·19	·18	·18	·19	·19	·20
	20	·16	·16	·16	·16	·16	·16	·16	·15	·15	·16	·16	·16
	30	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12
	40	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08
	50	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04
57	0	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
	10	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04
	20	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08
	30	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12
	40	·16	·16	·16	·16	·16	·16	·16	·16	·16	·16	·16	·16
	50	·20	·20	·20	·20	·20	·20	·19	·19	·19	·19	·20	·20
58	0	+ ·24	+ ·24	+ ·24	+ ·23	+ ·23	+ ·23	+ ·22	+ ·22	+ ·22	+ ·22	+ ·23	+ ·23
	10	·28	·28	·28	·27	·27	·27	·26	·26	·26	·26	·27	·27
	20	·32	·32	·32	·31	·31	·31	·30	·30	·30	·30	·31	·31
	30	+ ·36	+ ·36	+ ·36	+ ·35	+ ·35	+ ·35	+ ·34	+ ·34	+ ·34	+ ·34	+ ·35	+ ·35
	40	·40	·40	·40	·39	·39	·39	·38	·38	·38	·38	·39	·39
	50	·44	·44	·44	·43	·43	·43	·42	·42	·42	·42	·43	·43
59	0	+ ·49	+ ·49	+ ·49	+ ·48	+ ·47	+ ·47	+ ·46	+ ·46	+ ·45	+ ·45	+ ·46	+ ·47
	10	·53	·53	·53	·52	·51	·51	·50	·50	·49	·49	·50	·51
	20	·57	·57	·57	·56	·55	·55	·54	·54	·53	·53	·54	·55
	30	+ ·61	+ ·61	+ ·61	+ ·60	+ ·59	+ ·59	+ ·58	+ ·58	+ ·57	+ ·57	+ ·58	+ ·59
	40	·65	·65	·65	·64	·63	·63	·62	·62	·61	·61	·62	·63
	50	·69	·69	·69	·68	·67	·67	·66	·66	·65	·65	·66	·67
60	0	+ ·74	+ ·74	+ ·74	+ ·73	+ ·72	+ ·72	+ ·71	+ ·70	+ ·69	+ ·69	+ ·70	+ ·71
	10	·78	·78	·78	·77	·76	·76	·75	·74	·73	·73	·74	·75
	20	·82	·82	·82	·81	·80	·80	·79	·78	·77	·77	·78	·79
	30	+ ·86	+ ·86	+ ·86	+ ·85	+ ·84	+ ·84	+ ·83	+ ·82	+ ·81	+ ·81	+ ·82	+ ·83
	40	·90	·90	·90	·89	·88	·88	·87	·86	·85	·85	·86	·87
	50	·95	·95	·95	·94	·93	·92	·91	·90	·89	·90	·91	·92
61	0	+ 1·00	+ 1·00	+ 1·00	+ ·99	+ ·98	+ ·97	+ ·96	+ ·95	+ ·94	+ ·95	+ ·96	+ ·97
	10	1·04	1·04	1·04	1·03	1·02	1·01	1·00	·99	·98	·99	1·00	1·01
	20	1·08	1·08	1·08	1·07	1·06	1·05	1·04	1·03	1·02	1·03	1·04	1·05
	30	1·13	1·13	1·12	1·11	1·10	1·09	1·08	1·07	1·06	1·07	1·08	1·09

6ʰ 0ᵐ	6ʰ 30ᵐ	7ʰ 0ᵐ	7ʰ 30ᵐ	8ʰ 0ᵐ	8ʰ 30ᵐ	9ʰ 0ᵐ	9ʰ 30ᵐ	10ʰ 0ᵐ	10ʰ 30ᵐ	11ʰ 0ᵐ	11ʰ 30ᵐ	H. P. ′	″
feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet		
− ·69	− ·69	− ·69	− ·68	− ·67	− ·66	− ·65	− ·66	− ·67	− ·68	− ·69	− ·69	53	50
·65	·65	·65	·64	·63	·62	·61	·62	·63	·64	·65	·65	54	0
·61	·61	·61	·60	·59	·58	·57	·58	·59	·60	·61	·61		10
·57	·57	·57	·56	·55	·54	·54	·54	·55	·56	·57	·58		20
− ·54	− ·54	− ·54	− ·53	− ·52	− ·51	− ·51	− ·51	− ·52	− ·53	− ·54	− ·55		30
·51	·51	·51	·50	·49	·48	·48	·48	·49	·50	·51	·52		40
·48	·48	·48	·47	·46	·45	·45	·45	·46	·47	·47	·48		50
− ·45	− ·45	− ·45	− ·44	− ·43	− ·42	− ·42	− ·42	− ·43	− ·44	− ·44	− ·44	55	0
·42	·42	·42	·41	·40	·39	·39	·39	·40	·41	·41	·41		10
·39	·39	·39	·38	·37	·36	·36	·36	·37	·38	·38	·38		20
− ·35	− ·35	− ·35	− ·35	− ·34	− ·33	− ·33	− ·33	− ·34	− ·35	− ·35	− ·35		30
·31	·31	·31	·31	·30	·29	·29	·30	·30	·31	·31	·31		40
·27	·27	·27	·27	·26	·25	·25	·26	·26	·27	·27	·27		50
− ·23	− ·23	− ·23	− ·23	− ·22	− ·21	− ·21	− ·22	− ·22	− ·23	− ·23	− ·23	56	0
·20	·20	·20	·20	·19	·18	·18	·19	·19	·20	·20	·20		10
·16	·16	·16	·16	·16	·15	·15	·16	·16	·16	·16	·16		20
− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12	− ·12		30
·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08		40
·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04	·04		50
·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	57	0
+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04		10
·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08	·08		20
+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12	+ ·12		30
·16	·16	·16	·16	·16	·16	·16	·16	·16	·16	·16	·16		40
·20	·20	·20	·20	·20	·20	·19	·19	·19	·19	·20	·20		50
+ ·24	+ ·24	+ ·24	+ ·23	+ ·23	+ ·23	+ ·22	+ ·22	+ ·22	+ ·32	+ ·23	+ ·23	58	0
·28	·28	·28	·27	·27	·27	·26	·26	·26	·26	·27	·27		10
·32	·32	·32	·31	·31	·31	·30	·30	·30	·30	·31	·31		20
+ ·36	+ ·36	+ ·36	+ ·35	+ ·35	+ ·35	+ ·34	+ ·34	+ ·34	+ ·34	+ ·35	+ ·35		30
·40	·40	·40	·39	·39	·39	·38	·38	·38	·38	·39	·39		40
·44	·44	·44	·43	·43	·43	·42	·42	·42	·42	·43	·43		50
+ ·48	+ ·48	+ ·48	+ ·47	+ ·46	+ ·46	+ ·45	+ ·45	+ ·46	+ ·46	+ ·47	+ ·48	59	0
·52	·52	·52	·51	·50	·50	·49	·49	·50	·50	·51	·52		10
·56	·56	·56	·55	·54	·54	·53	·53	·54	·54	·55	·56		20
+ ·60	+ ·60	+ ·60	+ ·59	+ ·58	+ ·58	+ ·57	+ ·57	+ ·58	+ ·58	+ ·59	+ ·60		30
·64	·64	·64	·63	·62	·62	·61	·61	·62	·62	·63	·64		40
·68	·68	·68	·67	·66	·66	·65	·65	·66	·66	·67	·68		50
+ ·72	+ ·73	+ ·72	+ ·71	+ ·70	+ ·70	+ ·69	+ ·70	+ ·71	+ ·71	+ ·72	+ ·73	60	0
·76	·77	·76	·75	·74	·74	·73	·74	·75	·75	·76	·77		10
·80	·81	·80	·79	·78	·78	·77	·78	·79	·79	·80	·81		20
+ ·84	+ ·85	+ ·84	+ ·83	+ ·82	+ ·82	+ ·81	+ ·82	+ ·83	+ ·83	+ ·84	+ ·85		30
·88	·89	·88	·87	·86	·86	·85	·86	·87	·87	·88	·89		40
·93	·94	·93	·92	·91	·90	·89	·90	·91	·92	·93	·94		50
+ ·98	+ ·99	+ ·98	+ ·97	+ ·96	+ ·95	+ ·94	+ ·95	+ ·96	+ ·97	+ ·98	+ ·99	61	0
1·02	1·03	1·02	1·01	1·00	·99	·98	·99	1·00	1·01	1·02	1·03		10
1·06	1·07	1·06	1·05	1·04	1·03	1·02	1·03	1·04	1·05	1·06	1·07		20
1·10	1·11	1·10	1·09	1·08	1·07	1·06	1·07	1·08	1·09	1·10	1·12		30

Example.—Moon's apparent Transit 6ʰ 30ᵐ and H. P. 58′ 10″; correction = + 0·28 feet.

TABLE No. 7.—Correction for Sun's H. P. and Declination combined for London Heights.

Applicable to Moon's Transit B (or 4th previous).

Date		$0^h\ 0^m$	$0^h\ 30^m$	$1^h\ 0^m$	$1^h\ 30^m$	$2^h\ 0^m$	$2^h\ 30^m$	$3^h\ 0^m$	$3^h\ 30^m$	$4^h\ 0^m$	$4^h\ 30^m$	$5^h\ 0^m$	$5^h\ 30^m$	$6^h\ 0^m$	$6^h\ 30^m$	$7^h\ 0^m$	$7^h\ 30^m$	$8^h\ 0^m$	$8^h\ 30^m$	$9^h\ 0^m$	$9^h\ 30^m$	$10^h\ 0^m$	$10^h\ 30^m$	$11^h\ 0^m$	$11^h\ 30^m$	Date	
		feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*		
Jan.	1	− ·06	− ·06	− ·06	− ·06	− ·06	− ·05	− ·04	− ·02	− ·00	+ ·02	+ ·03	+ ·04	+ ·05	+ ·05	+ ·05	+ ·04	+ ·03	+ ·02	− ·01	− ·02	− ·04	− ·05	− ·06	− ·06	Jan.	1
	11	·04	·04	·04	·04	·03	·02	·03	·02	·00	·01	·02	·03	·03	·03	·03	·02	·02	·01	·00	·01	·02	·03	·04	·04		11
	21	·00	·00	·00	·01	·01	·01	·01	·01	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·01	·01	·01		21
	31	+ ·06	+ ·06	+ ·06	+ ·05	+ ·02	+ ·01	+ ·02	+ ·01	·00	− ·01	− ·02	− ·04	− ·05	− ·05	− ·05	− ·03	− ·02	− ·01	·00	+ ·01	+ ·02	+ ·03	+ ·04	+ ·05		31
Feb.	10	·09	·09	·09	·08	·05	·03	·05	·03	+ ·01	·02	·05	·07	·08	·08	·08	·07	·05	·02	+ ·01	·03	·05	·06	·07	·08	Feb.	10
	20	·12	·12	·12	·11	·06	·04	·06	·04	·02	·02	·05	·08	·10	·10	·10	·08	·06	·03	·01	·04	·06	·08	·09	·11		20
Mar.	2	·15	·15	·14	·13	·07	·05	·07	·05	·02	·02	·07	·11	·14	·14	·13	·10	·07	·03	·02	·05	·07	·09	·11	·13	Mar.	2
	12	·14	·14	·14	·13	·07	·05	·07	·05	·02	·02	·07	·11	·13	·13	·13	·11	·07	·03	·02	·05	·08	·10	·10	·12		12
	22	·13	·13	·13	·12	·08	·05	·08	·05	·02	·02	·07	·11	·13	·13	·13	·11	·07	·03	·02	·05	·07	·09	·11	·13		22
Apr.	1	·10	·10	·10	·09	·08	·07	·05	·03	·01	·02	·05	·08	·10	·10	·10	·08	·05	·02	·01	·03	·05	·07	·08	·09	Apr.	1
	11	·07	·07	·07	·07	·06	·05	·03	·01	·00	·02	·03	·05	·07	·07	·07	·05	·03	·02	·00	·02	·03	·05	·06	·07		11
	21	·02	·02	·02	·02	·02	·01	·01	·00	− ·01	·01	·01	·01	·01	·01	·01	·01	·01	·01	− ·01	·00	·01	·01	·02	·02		21
May	1	− ·04	− ·04	− ·04	− ·03	− ·03	− ·02	− ·02	− ·01	·01	·00	+ ·01	+ ·03	+ ·04	+ ·04	+ ·04	+ ·03	+ ·01	+ ·00	·01	− ·02	− ·02	− ·03	− ·03	− ·04	May	1
	11	·09	·09	·09	·08	·08	·07	·05	·04	·02	+ ·01	·05	·08	·10	·10	·10	·08	·05	·01	·02	·04	·05	·07	·08	·09		11
	21	·15	·15	·15	·14	·13	·11	·08	·05	·02	·02	·06	·10	·13	·14	·13	·10	·06	·02	·02	·05	·07	·11	·13	·14		21
	31	·19	·19	·19	·18	·16	·13	·10	·06	·02	·03	·08	·13	·16	·17	·16	·13	·08	·03	·02	·06	·09	·13	·16	·18		31
June	10	·22	·22	·22	·21	·19	·16	·12	·08	·03	·04	·10	·15	·19	·20	·19	·15	·10	·04	·03	·08	·12	·16	·19	·21	June	10
	20	·24	·24	·24	·23	·21	·17	·13	·08	·03	·04	·10	·16	·21	·22	·21	·16	·10	·04	·03	·08	·13	·17	·21	·23		20
	30	·24	·24	·24	·23	·21	·17	·13	·08	·03	·04	·10	·16	·21	·22	·21	·16	·10	·04	·03	·08	·13	·17	·21	·23		30
July	10	·21	·21	·21	·20	·18	·15	·11	·07	·02	·04	·09	·14	·18	·19	·18	·14	·09	·04	·02	·07	·11	·15	·18	·20	July	10
	20	·17	·17	·17	·16	·15	·12	·09	·06	·02	·03	·07	·11	·15	·16	·15	·11	·07	·03	·02	·05	·08	·12	·15	·17		20
	30	·12	·12	·12	·11	·11	·09	·06	·04	·02	·01	·05	·08	·10	·11	·10	·08	·05	·01	·02	·04	·06	·08	·10	·11		30
Aug.	9	·06	·06	·06	·05	·05	·04	·04	·03	·02	·00	·03	·05	·06	·06	·06	·05	·03	·00	·02	·03	·04	·04	·05	·05	Aug.	9
	19	·01	·01	·01	·00	·00	·00	·01	·01	·01	·00	·00	·00	·01	·01	·01	·00	·00	·00	·01	·01	·01	·00	·00	·01		19
	29	+ ·04	+ ·04	+ ·04	+ ·03	+ ·03	+ ·02	+ ·02	+ ·01	·00	− ·01	− ·02	− ·02	− ·03	− ·03	− ·03	− ·02	− ·02	− ·01	·00	+ ·01	+ ·02	+ ·02	+ ·03	+ ·03		29
Sept.	8	·07	·07	·07	·06	·06	·05	·04	·02	·00	·02	·04	·06	·07	·07	·07	·06	·04	·02	·00	·02	·04	·05	·06	·06	Sept.	8
	18	·09	·09	·09	·08	·08	·07	·05	·03	·00	·02	·04	·06	·08	·08	·08	·07	·05	·03	·00	·03	·05	·07	·08	·08		18
	28	·11	·11	·11	·10	·09	·08	·06	·04	+ ·01	·02	·06	·08	·10	·10	·10	·08	·06	·02	+ ·01	·04	·06	·08	·09	·10		28
Oct.	8	·12	·12	·12	·11	·09	·08	·06	·04	·02	·02	·06	·09	·12	·13	·12	·09	·06	·02	·02	·04	·05	·07	·08	·09	Oct.	8
	18	·10	·10	·10	·09	·08	·07	·05	·04	·02	·01	·04	·07	·09	·09	·09	·07	·05	·01	·02	·04	·05	·07	·08	·09		18
	28	·08	·08	·08	·07	·06	·05	·04	·03	·01	·01	·03	·05	·07	·07	·07	·06	·04	·02	·01	·03	·04	·05	·06	·07		28
Nov.	7	·04	·04	·04	·03	·02	·02	·01	·01	·00	·01	·02	·03	·04	·04	·04	·03	·02	·01	·01	·01	·02	·02	·03	·03	Nov.	7
	17	·00	·00	·00	− ·01	− ·02	− ·01	− ·01	− ·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	− ·01	− ·01	− ·01		17
	27	− ·02	− ·02	− ·02	·03	·03	·02	·01	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·01	·01	·01		27
Dec.	7	·05	·05	·05	·05	·05	·04	·03	·02	− ·00	+ ·02	+ ·03	+ ·04	+ ·04	+ ·04	+ ·04	+ ·04	+ ·03	+ ·02	− ·01	− ·02	− ·03	·04	·05	·05	Dec.	7
	17	·09	·09	·09	·08	·07	·06	·05	·03	·01	·01	·03	·05	·06	·06	·06	·05	·03	·01	·01	·03	·05	·06	·07	·08		17
	27	·09	·09	·09	·08	·07	·06	·05	·03	·01	·01	·03	·05	·06	·06	·06	·05	·03	·01	·01	·03	·05	·06	·07	·08		27
	37	·05	·05	·05	·05	·05	·04	·03	·02	·00	·02	·03	·04	·04	·04	·04	·04	·03	·02	·01	·02	·03	·04	·05	·05		37

Example.—June 30th and Moon's Apparent Transit $7^h\ 30^m$; correction = + 0·16 feet.

DUBLAT.

Deduced from the Observations 1881-84 (June 17th to Sept. 16th omitted from each year).

Low Water — Approximate Interval = 29h (neglecting Longitude)

Moon's Appl. Transit at Greenwich (h m)	Time (h m)	diff.	Moon's Appl. Transit at Greenwich (h m)	Time (h m)	diff.
0 0	4 53		6 0	10 0	
10	5 0	+7	10	10 19	+19
20	5 6	6	20	10 38	19
30	5 13	7	30	10 57	19
40	5 20	7	40	11 16	19
50	5 26	6	50	11 35	19
1 0	5 33	7	7 0	11 53	18
10	5 40	7	10	0 11	18
20	5 46	6	20	0 29	18
30	5 53	7	30	0 46	17
40	6 0	7	40	1 2	16
50	6 6	6	50	1 17	15
2 0	6 13	7	8 0	1 32	15
10	6 20	7	10	1 46	14
20	6 26	6	20	1 58	12
30	6 33	7	30	2 9	11
40	6 40	7	40	2 20	11
50	6 46	6	50	2 30	10
3 0	6 53	7	9 0	2 40	10
10	7 0	7	10	2 49	9
20	7 6	6	20	2 58	9
30	7 13	7	30	3 6	8
40	7 20	7	40	3 14	8
50	7 27	7	50	3 22	8
4 0	7 35	8	10 0	3 29	7
10	7 43	8	10	3 37	8
20	7 51	8	20	3 44	7
30	8 0	9	30	3 51	7
40	8 10	10	40	3 58	7
50	8 20	10	50	4 5	7
5 0	8 31	11	11 0	4 12	7
10	8 43	12	10	4 19	7
20	8 56	13	20	4 26	7
30	9 9	13	30	4 33	7
40	9 24	15	40	4 40	7
50	9 41	17	50	4 46	6
6 0	10 0	19	12 0	4 53	7

High Water — Approximate Interval = 35h (neglecting Longitude)

Moon's Appl. Transit at Greenwich (h m)	Time (h m)	diff.	Moon's Appl. Transit at Greenwich (h m)	Time (h m)	diff.
0 0	10 36		6 0	4 12	
10	10 43	+7	10	4 32	+20
20	10 50	7	20	4 52	20
30	10 57	7	30	5 12	20
40	11 4	7	40	5 31	19
50	11 11	7	50	5 49	18
1 0	11 18	7	7 0	6 7	18
10	11 25	7	10	6 24	17
20	11 32	7	20	6 40	16
30	11 39	7	30	6 54	14
40	11 46	7	40	7 8	14
50	11 54	8	50	7 21	13
2 0	0 1	7	8 0	7 33	12
10	0 8	7	10	7 44	11
20	0 16	8	20	7 55	11
30	0 23	7	30	8 5	10
40	0 30	7	40	8 14	9
50	0 38	8	50	8 23	9
3 0	0 45	7	9 0	8 31	8
10	0 53	8	10	8 39	8
20	1 0	7	20	8 47	8
30	1 8	8	30	8 54	7
40	1 16	8	40	9 1	7
50	1 24	8	50	9 9	8
4 0	1 32	8	10 0	9 16	7
10	1 41	9	10	9 23	7
20	1 50	9	20	9 29	6
30	1 59	9	30	9 36	7
40	2 9	10	40	9 43	7
50	2 21	12	50	9 49	6
5 0	2 34	13	11 0	9 56	7
10	2 48	14	10	10 3	7
20	3 3	15	20	10 9	6
30	3 19	16	30	10 16	7
40	3 36	17	40	10 23	7
50	3 54	18	50	10 29	6
6 0	4 12	18	12 0	10 36	7

Low Water — Factor = − 1·2

Moon's Appl. Transit at Greenwich (h m)	Height (feet)	diff.	Moon's Appl. Transit at Greenwich (h m)	Height (feet)	diff.
0 0	7·46		6 0	11·19	
10	7·45	−1	10	11·24	+5
20	7·45	0	20	11·28	4
30	7·45	0	30	11·30	2
40	7·47	+2	40	11·27	−3
50	7·50	3	50	11·21	6
1 0	7·55	5	7 0	11·11	10
10	7·60	5	10	10·99	12
20	7·66	6	20	10·86	13
30	7·74	8	30	10·71	15
40	7·82	8	40	10·53	18
50	7·91	9	50	10·34	19
2 0	8·00	9	8 0	10·13	21
10	8·10	10	10	9·91	22
20	8·21	11	20	9·70	21
30	8·32	11	30	9·51	19
40	8·44	12	40	9·33	18
50	8·56	12	50	9·17	16
3 0	8·68	12	9 0	9·02	15
10	8·81	13	10	8·87	15
20	8·95	14	20	8·73	14
30	9·09	14	30	8·59	14
40	9·24	15	40	8·45	14
50	9·39	15	50	8·32	13
4 0	9·55	16	10 0	8·19	13
10	9·71	16	10	8·07	12
20	9·87	16	20	7·96	11
30	10·03	16	30	7·86	10
40	10·19	16	40	7·78	8
50	10·34	15	50	7·71	7
5 0	10·49	15	11 0	7·66	5
10	10·63	14	10	7·61	5
20	10·77	14	20	7·57	4
30	10·90	13	30	7·54	3
40	11·02	12	40	7·51	3
50	11·12	10	50	7·48	3
6 0	11·19	7	12 0	7·46	2

High Water — Factor = + 1·2

Moon's Appl. Transit at Greenwich (h m)	Height (feet)	diff.	Moon's Appl. Transit at Greenwich (h m)	Height (feet)	diff.
0 0	21·04		6 0	17·14	
10	21·02	−2	10	17·12	−2
20	21·00	2	20	17·11	1
30	20·97	3	30	17·12	+1
40	20·93	4	40	17·22	10
50	20·89	4	50	17·35	13
1 0	20·84	5	7 0	17·51	16
10	20·78	6	10	17·68	17
20	20·72	6	20	17·86	18
30	20·65	7	30	18·05	19
40	20·57	8	40	18·23	18
50	20·48	9	50	18·41	18
2 0	20·39	9	8 0	18·58	17
10	20·29	10	10	18·75	17
20	20·18	11	20	18·92	17
30	20·06	12	30	19·09	17
40	19·93	13	40	19·25	16
50	19·80	13	50	19·41	16
3 0	19·66	14	9 0	19·56	15
10	19·52	14	10	19·71	15
20	19·37	15	20	19·85	14
30	19·22	15	30	19·99	14
40	19·07	15	40	20·13	14
50	18·92	15	50	20·27	14
4 0	18·77	15	10 0	20·40	13
10	18·62	15	10	20·52	12
20	18·46	16	20	20·63	11
30	18·30	16	30	20·73	10
40	18·14	16	40	20·81	8
50	17·97	17	50	20·88	7
5 0	17·81	16	11 0	20·94	6
10	17·65	16	10	20·99	5
20	17·50	15	20	21·03	3
30	17·37	13	30	21·04	2
40	17·27	10	40	21·05	1
50	17·19	8	50	21·05	0
6 0	17·14	5	12 0	21·04	−1

Note.—Time Correction for freshets = − 16m maximum August 15th (to be applied from June 17th to September 16th).

Note.—4·83 feet for Kedgeree gauge.

DIAMOND HARBOUR.

Deduced from the Observations 1881-84 (June 17th to September 16th omitted from each year).

Low Water — Approximate Interval = 32^h (neglecting Longitude)

Moon's Appt. Transit at Greenwich (h m)	Time (h m)	diff.	Moon's Appt. Transit at Greenwich (h m)	Time (h m)	diff.
0 0	8 7		6 0	0 31	
10	8 13	+ 6	10	0 48	+ 17
20	8 20	7	20	1 6	18
30	8 26	6	30	1 25	19
40	8 32	6	40	1 45	20
50	8 39	7	50	2 6	21
1 0	8 45	6	7 0	2 26	20
10	8 51	6	10	2 46	20
20	8 57	6	20	3 6	20
30	9 3	6	30	3 26	20
40	9 9	6	40	3 45	19
50	9 15	6	50	4 2	17
2 0	9 21	6	8 0	4 18	16
10	9 27	6	10	4 33	15
20	9 33	6	20	4 48	15
30	9 39	6	30	5 2	14
40	9 45	6	40	5 15	13
50	9 51	6	50	5 27	12
3 0	9 57	6	9 0	5 37	10
10	10 3	6	10	5 47	10
20	10 9	6	20	5 57	10
30	10 15	6	30	6 6	9
40	10 21	6	40	6 16	10
50	10 27	6	50	6 25	9
4 0	10 33	6	10 0	6 34	9
10	10 40	7	10	6 43	9
20	10 46	[illegible]	20	6 52	9
30	10 53	7	30	7 0	8
40	11 1	8	40	7 8	8
50	11 9	8	50	7 16	8
5 0	11 17	8	11 0	7 24	8
10	11 25	8	10	7 31	7
20	11 35	10	20	7 39	8
30	11 46	11	30	7 46	7
40	0 0	14	40	7 53	7
50	0 15	15	50	8 0	7
6 0	0 31	16	12 0	8 7	7

High Water — Approximate Interval = 36^h (neglecting Longitude)

Moon's Appt. Transit at Greenwich (h m)	Time (h m)	diff.	Moon's Appt. Transit at Greenwich (h m)	Time (h m)	diff.
0 0	0 14		6 0	6 1	
10	0 20	+ 6	10	6 19	+ 18
20	0 27	7	20	6 38	19
30	0 34	7	30	6 57	19
40	0 41	7	40	7 16	19
50	0 48	7	50	7 34	18
1 0	0 55	7	7 0	7 52	18
10	1 2	7	10	8 10	18
20	1 10	8	20	8 27	17
30	1 17	7	30	8 42	15
40	1 25	8	40	8 56	14
50	1 32	7	50	9 9	13
2 0	1 40	8	8 0	9 20	11
10	1 48	8	10	9 31	11
20	1 56	8	20	9 41	10
30	2 4	8	30	9 51	10
40	2 12	8	40	10 0	9
50	2 21	9	50	10 8	8
3 0	2 29	8	9 0	10 15	7
10	2 38	9	10	10 23	8
20	2 46	8	20	10 30	7
30	2 55	9	30	10 37	7
40	3 4	9	40	10 44	7
50	3 13	9	50	10 51	7
4 0	3 22	9	10 0	10 58	7
10	3 31	9	10	11 4	6
20	3 41	10	20	11 11	7
30	3 51	10	30	11 17	6
40	4 2	11	40	11 23	6
50	4 14	12	50	11 30	7
5 0	4 26	12	11 0	11 36	6
10	4 39	13	10	11 42	6
20	4 53	14	20	11 49	7
30	5 8	15	30	11 55	6
40	5 25	17	40	0 1	6
50	5 43	18	50	0 8	7
6 0	6 1	18	12 0	0 14	6

Note.—Calcutta Mean Time.

Low Water — Factor = − 1·0

Moon's Appt. Transit at Greenwich (h m)	Height (feet)	diff.	Moon's Appt. Transit at Greenwich (h m)	Height (feet)	diff.
0 0	1·60		6 0	4·49	
10	1·60	0	10	4·55	+ 6
20	1·60	0	20	4·59	4
30	1·61	+ 1	30	4·60	1
40	1·63	2	40	4·58	− 2
50	1·67	4	50	4·54	4
1 0	1·72	5	7 0	4·47	7
10	1·77	5	10	4·39	8
20	1·83	6	20	4·30	9
30	1·89	6	30	4·19	11
40	1·96	7	40	4·07	12
50	2·03	7	50	3·93	14
2 0	2·10	7	8 0	3·78	15
10	2·18	8	10	3·63	15
20	2·26	8	20	3·48	15
30	2·34	8	30	3·33	15
40	2·42	8	40	3·19	14
50	2·50	8	50	3·06	13
3 0	2·59	9	9 0	2·94	12
10	2·68	9	10	2·81	13
20	2·77	9	20	2·69	12
30	2·87	10	30	2·57	12
40	2·97	10	40	2·45	12
50	3·07	10	50	2·34	11
4 0	3·18	11	10 0	2·23	10
10	3·29	11	10	2·13	10
20	3·40	11	20	2·04	9
30	3·51	11	30	1·95	9
40	3·63	12	40	1·88	7
50	3·76	13	50	1·82	6
5 0	3·89	13	11 0	1·77	5
10	4·02	13	10	1·73	4
20	4·14	12	20	1·69	4
30	4·24	10	30	1·66	3
40	4·33	9	40	1·63	3
50	4·41	8	50	1·61	2
6 0	4·49	8	12 0	1·60	1

High Water — Factor = + 1·4

Moon's Appt. Transit at Greenwich (h m)	Height (feet)	diff.	Moon's Appt. Transit at Greenwich (h m)	Height (feet)	diff.
0 0	16·83		6 0	12·25	
10	16·82	− 1	10	12·24	− 1
20	16·80	2	20	12·24	0
30	16·76	4	30	12·24	0
40	16·72	4	40	12·30	+ 6
50	16·67	5	50	12·39	9
1 0	16·61	6	7 0	12·52	13
10	16·54	7	10	12·66	14
20	16·46	8	20	12·81	15
30	16·36	10	30	12·98	17
40	16·25	11	40	13·16	18
50	16·13	12	50	13·35	19
2 0	16·00	13	8 0	13·55	20
10	15·86	14	10	13·75	20
20	15·71	15	20	13·96	21
30	15·55	16	30	14·18	22
40	15·38	17	40	14·39	21
50	15·21	17	50	14·59	20
3 0	15·04	17	9 0	14·79	20
10	14·86	18	10	14·99	20
20	14·68	18	20	15·19	20
30	14·50	18	30	15·38	19
40	14·32	18	40	15·56	18
50	14·13	19	50	15·73	17
4 0	13·95	18	10 0	15·89	16
10	13·76	19	10	16·04	15
20	13·58	18	20	16·18	14
30	13·40	18	30	16·30	12
40	13·21	19	40	16·40	10
50	13·03	18	50	16·50	10
5 0	12·86	17	11 0	16·59	9
10	12·70	16	10	16·67	8
20	12·56	14	20	16·73	6
30	12·43	13	30	16·77	4
40	12·34	9	40	16·80	3
50	12·28	6	50	16·82	2
6 0	12·25	3	12 0	16·83	1

Note.—Referred to Kidderpore Dock Sill.

KIDDERPORE.

Deduced from the Observations 1881-84, omitting those from June 17th to September 16th.

Low Water Approximate Interval = 35h						High Water Approximate Interval = 39h					
Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time	
h m	h m	diff.	h m	h m	diff.	h m	h m	diff.	h m	h m	diff.
0 0	11 10		6 0	3 33		0 0	2 44		6 0	8 39	
10	11 17	+ 7	10	3 49	+ 16	10	2 50	+ 6	10	8 58	+ 19
20	11 23	6	20	4 6	17	20	2 57	7	20	9 18	20
30	11 30	7	30	4 25	19	30	3 4	7	30	9 37	19
40	11 37	7	40	4 45	20	40	3 11	7	40	9 56	19
50	11 43	6	50	5 6	21	50	3 18	7	50	10 14	18
1 0	11 49	6	7 0	5 28	22	1 0	3 25	7	7 0	10 31	17
10	11 55	6	10	5 50	22	10	3 32	7	10	10 48	17
20	0 1	6	20	6 11	21	20	3 40	8	20	11 4	16
30	0 7	6	30	6 31	20	30	3 47	7	30	11 20	16
40	0 13	6	40	6 50	19	40	3 55	8	40	11 34	14
50	0 19	6	50	7 7	17	50	4 2	7	50	11 46	12
2 0	0 25	6	8 0	7 22	15	2 0	4 10	8	8 0	11 56	10
10	0 31	6	10	7 37	15	10	4 18	8	10	0 6	10
20	0 36	5	20	7 51	14	20	4 26	8	20	0 15	9
30	0 42	6	30	8 4	13	30	4 34	8	30	0 24	9
40	0 48	6	40	8 17	13	40	4 42	8	40	0 32	8
50	0 53	6	50	8 29	12	50	4 51	9	50	0 40	8
3 0	0 59	6	9 0	8 40	11	3 0	4 59	8	9 0	0 48	8
10	1 5	6	10	8 50	10	10	5 8	9	10	0 55	7
20	1 10	5	20	9 0	10	20	5 17	9	20	1 2	7
30	1 16	6	30	9 10	10	30	5 26	9	30	1 9	7
40	1 22	6	40	9 20	10	40	5 35	9	40	1 16	7
50	1 27	5	50	9 29	9	50	5 44	9	50	1 22	6
4 0	1 33	6	10 0	9 38	9	4 0	5 54	10	10 0	1 29	7
10	1 39	6	10	9 47	9	10	6 4	10	10	1 35	6
20	1 45	6	20	9 55	8	20	6 15	11	20	1 41	6
30	1 52	7	30	10 3	8	30	6 26	11	30	1 47	6
40	2 0	8	40	10 11	8	40	6 37	11	40	1 53	6
50	2 8	8	50	10 19	8	50	6 49	12	50	1 59	6
5 0	2 17	9	11 0	10 26	7	5 0	7 2	13	11 0	2 5	6
10	2 26	9	10	10 34	8	10	7 15	13	10	2 11	6
20	2 37	11	20	10 41	7	20	7 29	14	20	2 18	7
30	2 49	12	30	10 48	7	30	7 45	16	30	2 24	6
40	3 2	13	40	10 55	7	40	8 2	17	40	2 31	7
50	3 17	15	50	11 3	8	50	8 20	18	50	2 37	6
6 0	3 33	16	12 0	11 10	7	6 0	8 39	19	12 0	2 44	7

Low Water Factor = − 0·3						High Water Factor = + 1·2					
Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height	
h m	feet	diff.	h m	feet	diff	h m	feet	diff.	h m	feet	diff.
0 0	4·74		6 0	5·72		0 0	16·20		6 0	12·01	
10	4·73	− 1	10	5·74	+ 2	10	16·19	− 1	10	12·00	− 1
20	4·73	0	20	5·76	2	20	16·17	2	20	12·00	0
30	4·74	+ 1	30	5·77	1	30	16·13	4	30	12·02	+ 2
40	4·76	2	40	5·77	0	40	16·09	4	40	12·08	6
50	4·78	2	50	5·76	− 1	50	16·05	4	50	12·17	9
1 0	4·80	2	7 0	5·74	2	1 0	16·00	5	7 0	12·28	11
10	4·82	2	10	5·72	2	10	15·94	6	10	12·40	12
20	4·84	2	20	5·69	3	20	15·87	7	20	12·54	14
30	4·87	3	30	5·66	3	30	15·78	9	30	12·69	15
40	4·89	2	40	5·62	4	40	15·69	9	40	12·85	16
50	4·91	2	50	5·57	5	50	15·59	10	50	13·01	16
2 0	4·94	3	8 0	5·51	6	2 0	15·47	12	8 0	13·18	17
10	4·97	3	10	5·45	6	10	15·35	12	10	13·36	18
20	4·99	2	20	5·40	5	20	15·22	13	20	13·54	18
30	5·02	3	30	5·35	5	30	15·08	14	30	13·72	18
40	5·05	3	40	5·30	5	40	14·93	15	40	13·91	19
50	5·07	2	50	5·25	5	50	14·78	15	50	14·09	18
3 0	5·10	3	9 0	5·21	4	3 0	14·62	16	9 0	14·27	18
10	5·13	3	10	5·17	4	10	14·46	16	10	14·45	18
20	5·16	3	20	5·13	4	20	14·29	17	20	14·62	17
30	5·19	3	30	5·09	4	30	14·12	17	30	14·79	17
40	5·22	3	40	5·05	4	40	13·94	18	40	14·95	16
50	5·25	3	50	5·01	4	50	13·76	18	50	15·11	16
4 0	5·28	3	10 0	4·98	3	4 0	13·58	18	10 0	15·27	16
10	5·31	3	10	4·95	3	10	13·40	18	10	15·42	15
20	5·34	3	20	4·92	3	20	13·23	17	20	15·56	14
30	5·38	4	30	4·89	3	30	13·06	17	30	15·68	12
40	5·42	4	40	4·86	3	40	12·89	17	40	15·79	11
50	5·46	4	50	4·84	2	50	12·73	16	50	15·89	10
5 0	5·51	5	11 0	4·82	2	5 0	12·57	16	11 0	15·98	9
10	5·55	4	10	4·80	2	10	12·42	15	10	16·06	8
20	5·59	4	20	4·78	2	20	12·30	12	20	16·12	6
30	5·63	4	30	4·77	1	30	12·20	10	30	16·17	5
40	5·66	3	40	4·76	1	40	12·12	8	40	16·20	3
50	5·69	3	50	4·75	1	50	12·06	6	50	16·20	0
6 0	5·72	3	12 0	4·74	1	6 0	12·01	5	12 0	16·20	0

Note.—Calcutta Mean Time.

ELEPHANT POINT.—(NEW SITE).

Deduced from the Observations 1884, January to June* (—3·90 feet).

Low Water Approximate Interval = 35ᵐ						High Water Approximate Interval = 40ᵐ						Low Water Factor = − 1·4						High Water Factor = + 1·6					
Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height	
h m	h m	diff.	h m	h m	diff.	h m	h m	diff.	h m	h m	diff.	h m	feet	diff.	h m	feet	diff.	h m	feet	diff.	h m	feet	diff.
0 0	11 23	+ 7	6 0	4 36	+ 18	0 0	4 29	+ 7	6 0	10 39	+ 19	0 0	3·00	− 1	6 0	7·58	+ 7	0 0	21·12	0	6 0	15·99	− 2
10	11 30	7	10	4 54	18	10	4 36	6	10	10 58	18	10	2·99	1	10	7·65	4	10	21·12	− 2	10	15·97	0
20	11 37	7	20	5 12	18	20	4 42	7	20	11 16	18	20	2·98	0	20	7·69	1	20	21·10	3	20	15·97	+ 2
30	11 44	6	30	5 30	18	30	4 49	7	30	11 34	17	30	2·98	+ 1	30	7·70	− 5	30	21·07	4	30	15·99	8
40	11 50	7	40	5 48	17	40	4 56	7	40	11 51	16	40	2·99	1	40	7·65	11	40	21·03	6	40	16·07	14
50	11 57	6	50	6 5	17	50	5 3	8	50	0 7	15	50	3·00	2	50	7·54	16	50	20·97	7	50	16·21	20
1 0	0 3	6	7 0	6 22	17	1 0	5 11	7	7 0	0 22	15	1 0	3·02	3	7 0	7·38	17	1 0	20·90	8	7 0	16·41	21
10	0 9	7	10	6 39	16	10	5 18	7	10	0 37	14	10	3·05	3	10	7·21	19	10	20·82	8	10	16·62	21
20	0 16	6	20	6 55	15	20	5 25	8	20	0 51	13	20	3·08	4	20	7·02	20	20	20·74	9	20	16·83	22
30	0 22	6	30	7 10	15	30	5 33	8	30	1 4	12	30	3·12	5	30	6·82	21	30	20·65	10	30	17·05	23
40	0 28	6	40	7 25	14	40	5 41	7	40	1 16	11	40	3·17	6	40	6·61	23	40	20·55	10	40	17·28	24
50	0 34	6	50	7 39	13	50	5 48	8	50	1 27	10	50	3·23	6	50	6·38	25	50	20·45	11	50	17·52	24
2 0	0 40	6	8 0	7 52	13	2 0	5 56	8	8 0	1 37	10	2 0	3·29	8	8 0	6·13	25	2 0	20·34	12	8 0	17·76	25
10	0 46	6	10	8 5	12	10	6 4	9	10	1 47	9	10	3·37	9	10	5·88	24	10	20·22	12	10	18·01	24
20	0 52	6	20	8 17	12	20	6 13	8	20	1 56	9	20	3·46	11	20	5·64	23	20	20·10	13	20	18·25	24
30	0 58	6	30	8 29	11	30	6 21	9	30	2 5	8	30	3·57	13	30	5·41	22	30	19·97	13	30	18·49	23
40	1 4	6	40	8 40	11	40	6 30	8	40	2 13	8	40	3·70	14	40	5·19	21	40	19·84	15	40	18·72	22
50	1 10	6	50	8 51	10	50	6 38	9	50	2 21	8	50	3·84	16	50	4·98	20	50	19·69	16	50	18·94	21
3 0	1 16	7	9 0	9 1	9	3 0	6 47	9	9 0	2 29	7	3 0	4·00	17	9 0	4·78	19	3 0	19·53	16	9 0	19·15	20
10	1 23	7	10	9 10	10	10	6 56	9	10	2 36	8	10	4·17	18	10	4·59	18	10	19·37	18	10	19·35	19
20	1 30	7	20	9 20	9	20	7 5	9	20	2 44	7	20	4·35	20	20	4·41	18	20	19·19	19	20	19·54	19
30	1 37	8	30	9 29	9	30	7 14	10	30	2 51	7	30	4·55	21	30	4·23	16	30	19·00	20	30	19·73	17
40	1 45	8	40	9 38	8	40	7 24	10	40	2 58	7	40	4·76	22	40	4·07	14	40	18·80	21	40	19·90	16
50	1 53	8	50	9 46	8	50	7 34	10	50	3 5	7	50	4·98	24	50	3·93	13	50	18·59	23	50	20·06	15
4 0	2 1	9	10 0	9 54	8	4 0	7 44	11	10 0	3 12	6	4 0	5·22	24	10 0	3·80	12	4 0	18·36	23	10 0	20·21	14
10	2 10	10	10	10 2	7	10	7 55	12	10	3 18	7	10	5·46	23	10	3·68	11	10	18·13	23	10	20·35	13
20	2 20	10	20	10 9	8	20	8 7	12	20	3 25	6	20	5·69	23	20	3·57	10	20	17·90	23	20	20·48	11
30	2 30	11	30	10 17	8	30	8 19	13	30	3 31	6	30	5·92	24	30	3·47	9	30	17·67	24	30	20·59	10
40	2 41	12	40	10 25	7	40	8 32	13	40	3 37	7	40	6·16	23	40	3·38	8	40	17·43	25	40	20·69	10
50	2 53	12	50	10 32	8	50	8 45	14	50	3 44	6	50	6·39	22	50	3·30	7	50	17·18	26	50	20·79	9
5 0	3 5	12	11 0	10 40	7	5 0	8 59	15	11 0	3 50	6	5 0	6·61	21	11 0	3·23	6	5 0	16·92	24	11 0	20·88	7
10	3 17	14	10	10 47	8	10	9 14	15	10	3 56	7	10	6·82	20	10	3·17	5	10	16·68	21	10	20·95	6
20	3 31	15	20	10 55	7	20	9 29	16	20	4 3	6	20	7·02	18	20	3·12	4	20	16·47	17	20	21·01	5
30	3 46	16	30	11 2	7	30	9 45	17	30	4 9	7	30	7·20	16	30	3·08	3	30	16·30	14	30	21·06	3
40	4 2	17	40	11 9	7	40	10 2	18	40	4 16	6	40	7·36	13	40	3·05	3	40	16·16	11	40	21·09	2
50	4 19	17	50	11 16	7	50	10 20	19	50	4 22	7	50	7·49	9	50	3·02	2	50	16·05	6	50	21·11	1
6 0	4 36		12 0	11 23		6 0	10 39		12 0	4 29		6 0	7·58		12 0	3·00		6 0	15·99		12 0	21·12	

* More Observations desirable.

RANGOON.

Deduced from the Observations 1880-84 (Dry Season only).

LOW WATER Approximate Interval = 36ʰ

Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time	
h m	h m	diff.	h m	h m	diff.
0 0	0 39		6 0	5 37	
10	0 46	+ 7	10	5 55	+ 18
20	0 52	6	20	6 13	18
30	0 59	7	30	6 31	18
40	1 6	7	40	6 49	18
50	1 12	6	50	7 7	18
1 0	1 19	7	7 0	7 25	18
10	1 26	7	10	7 43	18
20	1 32	6	20	8 0	17
30	1 39	7	30	8 17	17
40	1 45	6	40	8 33	16
50	1 52	7	50	8 48	15
2 0	1 58	6	8 0	9 1	13
10	2 4	6	10	9 14	13
20	2 10	6	20	9 27	13
30	2 16	6	30	9 39	12
40	2 22	6	40	9 51	12
50	2 28	6	50	10 3	12
3 0	2 34	6	9 0	10 14	11
10	2 41	7	10	10 24	10
20	2 47	6	20	10 34	10
30	2 54	7	30	10 44	10
40	3 1	7	40	10 53	9
50	3 8	7	50	11 2	9
4 0	3 15	7	10 0	11 10	8
10	3 23	8	10	11 18	8
20	3 31	8	20	11 26	8
30	3 40	9	30	11 34	8
40	3 50	10	40	11 42	8
50	4 0	10	50	11 50	8
5 0	4 11	11	11 0	11 57	7
10	4 23	12	10	0 4	7
20	4 35	12	20	0 11	7
30	4 48	13	30	0 18	7
40	5 3	15	40	0 25	7
50	5 19	16	50	0 32	7
6 0	5 37	18	12 0	0 39	7

HIGH WATER Approximate Interval = 41ʰ

Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time	
h m	h m	diff.	h m	h m	diff.
0 0	5 25		6 0	11 29	
10	5 32	+ 7	10	11 49	+ 20
20	5 39	7	20	0 8	19
30	5 46	7	30	0 26	18
40	5 53	7	40	0 43	17
50	6 1	8	50	0 59	16
1 0	6 8	7	7 0	1 14	15
10	6 15	7	10	1 29	15
20	6 23	8	20	1 43	14
30	6 30	7	30	1 56	13
40	6 38	8	40	2 8	12
50	6 45	7	50	2 19	11
2 0	6 53	8	8 0	2 29	10
10	7 1	8	10	2 39	10
20	7 10	9	20	2 48	9
30	7 18	8	30	2 57	9
40	7 27	9	40	3 6	9
50	7 35	8	50	3 14	8
3 0	7 44	9	9 0	3 22	8
10	7 53	9	10	3 29	7
20	8 2	9	20	3 37	8
30	8 11	9	30	3 44	7
40	8 20	9	40	3 51	7
50	8 30	10	50	3 58	7
4 0	8 40	10	10 0	4 5	7
10	8 51	11	10	4 12	7
20	9 2	11	20	4 18	6
30	9 13	11	30	4 25	7
40	9 25	12	40	4 32	7
50	9 37	12	50	4 38	6
5 0	9 50	13	11 0	4 45	7
10	10 4	14	10	4 52	7
20	10 19	15	20	4 58	6
30	10 34	15	30	5 5	7
40	10 51	17	40	5 12	7
50	11 9	18	50	5 18	6
6 0	11 29	20	12 0	5 25	7

LOW WATER Factor = − 0·9

Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height	
h m	feet	diff.	h m	feet	diff.
0 0	2·16		6 0	4·85	
10	2·15	− 1	10	4·90	+ 5
20	2·14	1	20	4·93	3
30	2·14	0	30	4·94	1
40	2·14	0	40	4·89	− 5
50	2·14	0	50	4·81	8
1 0	2·14	0	7 0	4·68	13
10	2·15	+ 1	10	4·54	14
20	2·16	1	20	4·40	14
30	2·18	2	30	4·25	15
40	2·21	3	40	4·09	16
50	2·25	4	50	3·93	16
2 0	2·30	5	8 0	3·77	16
10	2·35	5	10	3·61	16
20	2·40	5	20	3·45	16
30	2·46	6	30	3·30	15
40	2·53	7	40	3·17	13
50	2·60	7	50	3·05	12
3 0	2·68	8	9 0	2·93	12
10	2·77	9	10	2·83	10
20	2·86	9	20	2·73	10
30	2·96	10	30	2·64	9
40	3·07	11	40	2·56	8
50	3·19	12	50	2·50	6
4 0	3·32	13	10 0	2·46	4
10	3·45	13	10	2·42	4
20	3·58	13	20	2·38	4
30	3·72	14	30	2·34	4
40	3·87	15	40	2·31	3
50	4·02	15	50	2·28	3
5 0	4·16	14	11 0	2·25	3
10	4·30	14	10	2·23	2
20	4·43	13	20	2·21	2
30	4·56	13	30	2·20	1
40	4·67	11	40	2·18	2
50	4·77	10	50	2·17	1
6 0	4·85	8	12 0	2·16	1

HIGH WATER Factor = + 1·4

Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height	
h m	feet	diff.	h m	feet	diff.
0 0	18·50		6 0	14·10	
10	18·50	0	10	14·09	− 1
20	18·49	− 1	20	14·10	+ 1
30	18·46	3	30	14·14	4
40	18·43	3	40	14·23	9
50	18·40	3	50	14·36	13
1 0	18·36	4	7 0	14·53	17
10	18·31	5	10	14·71	18
20	18·25	6	20	14·90	19
30	18·18	7	30	15·10	20
40	18·10	8	40	15·30	20
50	18·02	8	50	15·50	20
2 0	17·93	9	8 0	15·70	20
10	17·83	10	10	15·91	21
20	17·72	11	20	16·12	21
30	17·61	11	30	16·32	20
40	17·48	13	40	16·50	18
50	17·34	14	50	16·68	18
3 0	17·19	15	9 0	16·85	17
10	17·04	15	10	17·01	16
20	16·88	16	20	17·16	15
30	16·70	18	30	17·31	15
40	16·52	18	40	17·45	14
50	16·33	19	50	17·58	13
4 0	16·14	19	10 0	17·70	12
10	15·95	19	10	17·81	11
20	15·75	20	20	17·92	11
30	15·55	20	30	18·02	10
40	15·34	21	40	18·11	9
50	15·12	22	50	18·19	8
5 0	14·89	23	11 0	18·26	7
10	14·69	20	10	18·32	6
20	14·51	18	20	18·37	5
30	14·34	17	30	18·42	5
40	14·23	12	40	18·46	4
50	14·14	8	50	18·49	3
6 0	14·10	4	12 0	18·50	1

AMHERST.

Deduced from the Observations 1880-84 (Dry Season only), −4·61 feet.

Low Water — Approximate Interval = 34h

Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time	
h m	h m	diff.	h m	h m	diff.
0 0	9 42		6 0	3 17	
10	9 49	+ 7	10	3 35	+ 18
20	9 56	7	20	3 53	17
30	10 3	7	30	4 9	17
40	10 10	7	40	4 26	17
50	10 17	7	50	4 43	17
1 0	10 24	7	7 0	5 0	17
10	10 31	7	10	5 17	17
20	10 37	6	20	5 33	16
30	10 44	7	30	5 47	14
40	10 51	7	40	6 1	14
50	10 58	7	50	6 14	13
2 0	11 5	7	8 0	6 26	12
10	11 12	7	10	6 37	11
20	11 19	7	20	6 48	11
30	11 26	7	30	6 59	11
40	11 33	7	40	7 9	10
50	11 41	8	50	7 19	10
3 0	11 48	7	9 0	7 28	9
10	11 56	8	10	7 37	9
20	0 3	7	20	7 45	8
30	0 11	8	30	7 53	8
40	0 19	8	40	8 1	8
50	0 27	8	50	8 8	7
4 0	0 36	9	10 0	8 16	8
10	0 45	9	10	8 23	7
20	0 55	10	20	8 31	8
30	1 6	11	30	8 38	7
40	1 17	11	40	8 45	7
50	1 29	12	50	8 53	8
5 0	1 41	12	11 0	9 0	7
10	1 54	13	10	9 7	7
20	2 8	14	20	9 14	7
30	2 23	15	30	9 21	7
40	2 40	17	40	9 28	7
50	2 58	18	50	9 35	7
6 0	3 17	19	12 0	9 42	7

High Water — Approximate Interval = 39h

Moon's Appt. Transit at Greenwich	Time		Moon's Appt. Transit at Greenwich	Time	
h m	h m	diff.	h m	h m	diff.
0 0	3 13		6 0	9 28	
10	3 20	+ 7	10	9 47	+ 19
20	3 27	7	20	10 5	18
30	3 34	7	30	10 22	17
40	3 41	7	40	10 39	17
50	3 48	7	50	10 55	16
1 0	3 55	7	7 0	11 10	15
10	4 2	7	10	11 24	14
20	4 10	8	20	11 38	14
30	4 17	7	30	11 51	13
40	4 25	8	40	0 2	11
50	4 32	7	50	0 13	11
2 0	4 40	8	8 0	0 23	10
10	4 48	8	10	0 32	9
20	4 56	8	20	0 41	9
30	5 5	9	30	0 50	9
40	5 14	9	40	0 58	8
50	5 23	9	50	1 6	8
3 0	5 32	9	9 0	1 13	7
10	5 41	9	10	1 20	7
20	5 51	10	20	1 27	7
30	6 1	10	30	1 34	7
40	6 11	10	40	1 41	7
50	6 22	11	50	1 47	6
4 0	6 33	11	10 0	1 54	7
10	6 44	11	10	2 0	6
20	6 56	12	20	2 7	7
30	7 8	12	30	2 13	6
40	7 21	13	40	2 20	7
50	7 35	14	50	2 26	6
5 0	7 49	14	11 0	2 33	7
10	8 4	15	10	2 40	7
20	8 19	15	20	2 46	6
30	8 35	16	30	2 53	7
40	8 52	17	40	3 0	7
50	9 10	18	50	3 6	6
6 0	9 28	18	12 0	3 13	7

Low Water — Factor = − 1·8

Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height	
h m	feet	diff.	h m	feet	diff.
0 0	−0·50		6 0	+5·00	
10	0·52	− 2	10	5·06	+ 6
20	0·53	1	20	5·09	3
30	0·54	1	30	5·09	0
40	0·53	+ 1	40	5·02	− 7
50	0·52	1	50	4·89	13
1 0	0·50	2	7 0	4·71	18
10	0·46	4	10	4·52	19
20	0·41	5	20	4·30	22
30	0·35	6	30	4·06	24
40	0·27	8	40	3·81	25
50	0·18	9	50	3·55	26
2 0	0·07	9	8 0	3·27	28
10	+0·04	11	10	3·00	27
20	0·17	13	20	2·72	28
30	0·31	14	30	2·44	28
40	0·46	15	40	2·18	26
50	0·62	16	50	1·93	25
3 0	0·78	16	9 0	1·70	23
10	0·95	17	10	1·47	23
20	1·14	19	20	1·25	22
30	1·36	22	30	1·04	21
40	1·59	23	40	0·85	19
50	1·83	24	50	0·68	17
4 0	2·09	26	10 0	0·52	16
10	2·35	26	10	0·37	15
20	2·62	27	20	0·23	14
30	2·90	28	30	0·11	12
40	3·19	29	40	0·00	11
50	3·49	30	50	−0·10	10
5 0	3·80	31	11 0	0·18	8
10	4·09	29	10	0·25	7
20	4·35	26	20	0·31	6
30	4·58	23	30	0·37	6
40	4·75	17	40	0·42	5
50	4·89	14	50	0·46	4
6 0	5·00	11	12 0	0·50	4

High Water — Factor = + 1·8

Moon's Appt. Transit at Greenwich	Height		Moon's Appt. Transit at Greenwich	Height	
h m	feet	diff.	h m	feet	diff.
0 0	18·41		6 0	12·94	
10	18·41	0	10	12·93	− 1
20	18·39	− 2	20	12·95	+ 2
30	18·35	4	30	13·02	7
40	18·31	4	40	13·13	11
50	18·26	5	50	13·28	15
1 0	18·21	5	7 0	13·47	19
10	18·15	6	10	13·68	21
20	18·07	8	20	13·90	22
30	17·98	9	30	14·12	22
40	17·89	10	40	14·35	23
50	17·79	10	50	14·59	24
2 0	17·68	11	8 0	14·83	24
10	17·56	12	10	15·08	25
20	17·42	14	20	15·32	24
30	17·27	15	30	15·56	24
40	17·11	16	40	15·79	23
50	16·93	18	50	16·01	22
3 0	16·73	20	9 0	16·23	22
10	16·53	20	10	16·44	21
20	16·32	21	20	16·65	21
30	16·09	23	30	16·85	20
40	15·84	25	40	17·04	19
50	15·59	25	50	17·22	18
4 0	15·33	26	10 0	17·39	17
10	15·07	26	10	17·54	15
20	14·80	27	20	17·69	15
30	14·54	26	30	17·83	16
40	14·27	27	40	17·95	12
50	14·01	26	50	18·06	11
5 0	13·76	25	11 0	18·17	11
10	13·53	23	10	18·24	7
20	13·33	20	20	18·30	6
30	13·16	17	30	18·35	5
40	13·05	11	40	18·38	3
50	12·98	7	50	18·40	2
6 0	12·94	4	12 0	18·41	1

MOULMEIN.

Deduced from the Observations 1880-84 (—0·96 applied to observation for chart datum. Dry Season only).

Low Water (Approximate Interval = 37ʰ) Moon's Appt. Transit at Greenwich (h m)	Time (h m)	diff.	Moon's Appt. Transit at Greenwich (h m)	Time (h m)	diff.	High Water (Approximate Interval = 40ʰ) Moon's Appt. Transit at Greenwich (h m)	Time (h m)	diff.	Moon's Appt. Transit at Greenwich (h m)	Time (h m)	diff.
0 0	0 47		6 0	5 46		0 0	4 28		6 0	10 34	
10	0 53	+ 6	10	6 4	+ 18	10	4 35	+ 7	10	10 53	+ 19
20	1 0	7	20	6 22	18	20	4 41	6	20	11 11	18
30	1 7	7	30	6 40	18	30	4 48	7	30	11 28	17
40	1 14	7	40	6 59	19	40	4 55	7	40	11 45	17
50	1 21	7	50	7 17	18	50	5 2	7	50	0 1	16
1 0	1 28	7	7 0	7 36	19	1 0	5 9	7	7 0	0 17	16
10	1 35	7	10	7 55	19	10	5 16	7	10	0 32	15
20	1 41	6	20	8 13	18	20	5 23	7	20	0 47	15
30	1 48	7	30	8 30	17	30	5 30	7	30	1 1	14
40	1 55	7	40	8 46	16	40	5 37	7	40	1 13	12
50	2 2	7	50	9 1	15	50	5 45	8	50	1 24	11
2 0	2 9	7	8 0	9 15	14	2 0	5 52	7	8 0	1 35	11
10	2 16	7	10	9 29	14	10	6 0	8	10	1 45	10
20	2 22	6	20	9 42	13	20	6 7	7	20	1 54	9
30	2 29	7	30	9 54	12	30	6 15	8	30	2 3	9
40	2 36	7	40	10 6	12	40	6 23	8	40	2 11	8
50	2 43	7	50	10 17	11	50	6 32	9	50	2 19	8
3 0	2 50	7	9 0	10 27	10	3 0	6 40	8	9 0	2 27	8
10	2 57	7	10	10 37	10	10	6 49	9	10	2 35	8
20	3 4	7	20	10 46	9	20	6 58	9	20	2 42	7
30	3 11	7	30	10 55	9	30	7 7	9	30	2 49	7
40	3 18	7	40	11 4	9	40	7 17	10	40	2 56	7
50	3 26	8	50	11 12	8	50	7 27	10	50	3 2	6
4 0	3 33	7	10 0	11 20	8	4 0	7 37	10	10 0	3 9	7
10	3 41	8	10	11 28	8	10	7 48	11	10	3 16	7
20	3 49	8	20	11 36	8	20	7 59	11	20	3 22	6
30	3 57	8	30	11 43	7	30	8 11	12	30	3 29	7
40	4 6	9	40	11 51	8	40	8 24	13	40	3 36	7
50	4 15	9	50	11 58	7	50	8 38	14	50	3 42	6
5 0	4 25	10	11 0	0 5	7	5 0	8 53	15	11 0	3 49	7
10	4 35	10	10	0 12	7	10	9 8	15	10	3 55	6
20	4 46	11	20	0 19	7	20	9 24	16	20	4 2	7
30	4 59	13	30	0 26	7	30	9 40	16	30	4 8	6
40	5 13	14	40	0 33	7	40	9 57	17	40	4 15	7
50	5 29	16	50	0 40	7	50	10 15	18	50	4 21	6
6 0	5 46	17	12 0	0 47	7	6 0	10 34	19	12 0	4 28	7

Low Water (Factor = − 0·2) Moon's Appt. Transit at Greenwich (h m)	Height (feet)	diff.	Moon's Appt. Transit at Greenwich (h m)	Height (feet)	diff.	High Water (Factor = + 1·6) Moon's Appt. Transit at Greenwich (h m)	Height (feet)	diff.	Moon's Appt. Transit at Greenwich (h m)	Height (feet)	diff.
0 0	2·79		6 0	2·24		0 0	14·55		6 0	9·39	
10	2·80	+ 1	10	2·22	− 2	10	14·55	0	10	9·37	− 2
20	2·81	1	20	2·21	1	20	14·54	− 1	20	9·37	0
30	2·82	1	30	2·19	2	30	14·53	1	30	9·41	+ 4
40	2·83	1	40	2·18	1	40	14·51	2	40	9·49	8
50	2·83	0	50	2·16	2	50	14·48	3	50	9·65	16
1 0	2·82	− 1	7 0	2·15	1	1 0	14·43	5	7 0	9·85	20
10	2·82	0	10	2·15	0	10	14·37	6	10	10·06	21
20	2·81	1	20	2·14	1	20	14·31	6	20	10·28	22
30	2·80	1	30	2·13	1	30	14·24	7	30	10·51	23
40	2·79	1	40	2·13	0	40	14·16	8	40	10·75	24
50	2·78	1	50	2·13	0	50	14·07	9	50	10·99	24
2 0	2·76	2	8 0	2·13	0	2 0	13·98	9	8 0	11·23	24
10	2·75	1	10	2·14	+ 1	10	13·87	10	10	11·48	25
20	2·73	2	20	2·15	1	20	13·75	12	20	11·72	24
30	2·71	2	30	2·17	2	30	13·62	13	30	11·96	24
40	2·69	2	40	2·20	3	40	13·48	14	40	12·18	22
50	2·67	2	50	2·23	3	50	13·32	16	50	12·39	21
3 0	2·64	3	9 0	2·27	4	3 0	13·16	16	9 0	12·59	20
10	2·61	3	10	2·31	4	10	12·99	17	10	12·78	19
20	2·59	2	20	2·35	4	20	12·81	18	20	12·96	18
30	2·56	3	30	2·39	4	30	12·61	20	30	13·14	18
40	2·53	3	40	2·43	4	40	12·40	21	40	13·31	17
50	2·51	2	50	2·47	4	50	12·17	23	50	13·47	16
4 0	2·48	3	10 0	2·51	4	4 0	11·94	23	10 0	13·61	14
10	2·46	2	10	2·55	4	10	11·70	24	10	13·75	14
20	2·43	3	20	2·59	4	20	11·45	25	20	13·88	13
30	2·41	2	30	2·62	3	30	11·20	25	30	14·00	12
40	2·39	2	40	2·65	3	40	10·93	27	40	14·11	11
50	2·37	2	50	2·67	2	50	10·65	28	50	14·20	9
5 0	2·35	2	11 0	2·70	3	5 0	10·37	28	11 0	14·28	8
10	2·33	2	10	2·72	2	10	10·11	26	10	14·36	8
20	2·31	2	20	2·74	2	20	9·88	23	20	14·42	6
30	2·29	2	30	2·75	1	30	9·69	19	30	14·47	5
40	2·27	2	40	2·77	2	40	9·54	15	40	14·51	4
50	2·26	1	50	2·78	1	50	9·44	10	50	14·54	3
6 0	2·24	2	12 0	2·79	1	6 0	9·39	5	12 0	14·55	1

DUBLAT.

Freshets Correction (High Water Heights). Arguments—Date and Approximate Apparent Time of Moon's Transit.

Moon's Transit	0h 0m	0h 30m	1h 0m	1h 30m	2h 0m	2h 30m	3h 0m	3h 30m	4h 0m	4h 30m	5h 0m	5h 30m	6h 0m
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·14	+ ·16	+ ·17	+ ·18	+ ·19	+ ·19	+ ·19	+ ·19	+ ·19	+ ·18	+ ·17	+ ·16	+ ·14
22	·29	·31	·34	·36	·38	·38	·38	·38	·38	·36	·34	·31	·29
25	·42	·45	·48	·52	·54	·56	·56	·56	·54	·52	·48	·45	·42
28	·55	·60	·65	·70	·73	·75	·75	·75	·73	·70	·65	·60	·55
July 1	+ ·67	+ ·74	+ ·80	+ ·86	+ ·89	+ ·92	+ ·92	+ ·92	+ ·89	+ ·86	+ ·80	+ ·74	+ ·67
4	·81	·88	·95	1·01	1·05	1·08	1·08	1·08	1·05	1·01	·95	·88	·81
7	·93	1·01	1·09	1·17	1·22	1·25	1·26	1·25	1·22	1·17	1·09	1·01	·93
10	1·06	1·15	1·23	1·33	1·38	1·41	1·42	1·41	1·38	1·33	1·23	1·15	1·06
13	1·16	1·27	1·36	1·46	1·52	1·56	1·57	1·56	1·52	1·46	1·36	1·27	1·16
16	+1·27	+1·38	+1·48	+1·60	+1·66	+1·70	+1·71	+1·70	+1·66	+1·60	+1·48	+1·38	+1·27
19	1·36	1·48	1·59	1·71	1·77	1·82	1·83	1·82	1·77	1·71	1·59	1·48	1·36
22	1·45	1·58	1·69	1·82	1·89	1·94	1·95	1·94	1·89	1·82	1·69	1·58	1·45
25	1·52	1·66	1·78	1·91	1·99	2·04	2·05	2·04	1·99	1·91	1·78	1·66	1·52
28	1·59	1·74	1·86	2·00	2·08	2·13	2·14	2·13	2·08	2·00	1·86	1·74	1·59
31	+1·65	+1·79	+1·92	+2·07	+2·15	+2·21	+2·22	+2·21	+2·15	+2·07	+1·92	+1·79	+1·65
Aug. 3	1·70	1·85	1·99	2·14	2·22	2·28	2·29	2·28	2·22	2·14	1·99	1·85	1·70
6	1·74	1·89	2·03	2·18	2·27	2·33	2·34	2·33	2·27	2·18	2·03	1·89	1·74
9	1·77	1·93	2·08	2·23	2·32	2·38	2·39	2·38	2·32	2·23	2·08	1·93	1·77
12	1·79	1·95	2·11	2·25	2·34	2·40	2·41	2·40	2·34	2·25	2·11	1·95	1·79
15	+1·79	+1·95	+2·11	+2·25	+2·34	+2·40	+2·41	+2·40	+2·34	+2·25	+2·11	+1·95	+1·79
18	1·77	1·93	2·08	2·23	2·32	2·38	2·39	2·38	2·32	2·23	2·08	1·93	1·77
21	1·70	1·85	1·99	2·14	2·22	2·28	2·29	2·28	2·22	2·14	1·99	1·85	1·70
24	1·59	1·74	1·86	2·00	2·08	3·13	2·14	2·13	2·08	2·00	1·86	1·74	1·59
27	1·45	1·58	1·69	1·82	1·89	1·94	1·95	1·94	1·89	1·82	1·69	1·58	1·45
30	+1·27	+1·38	+1·48	+1·60	+1·66	+1·70	+1·71	+1·70	+1·66	+1·60	+1·48	+1·38	+1·27
Sept. 2	1·06	1·15	1·23	1·33	1·38	1·41	1·42	1·41	1·38	1·33	1·23	1·15	1·06
5	·81	·88	·95	1·01	1·05	1·08	1·08	1·08	1·05	1·01	·95	·88	·81
8	·55	·60	·65	·70	·73	·75	·75	·75	·73	·70	·65	·60	·55
11	·29	·31	·34	·36	·38	·38	·38	·38	·38	·36	·34	·31	·29
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

Moon's Transit	6h 30m	7h 0m	7h 30m	8h 0m	8h 30m	9h 0m	9h 30m	10h 0m	10h 30m	11h 0m	11h 30m	12h 0m
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·13	+ ·13	+ ·12	+ ·12	+ ·11	+ ·11	+ ·11	+ ·12	+ ·12	+ ·13	+ ·13	+ ·14
22	·26	·25	·24	·23	·22	·21	·22	·23	·24	·25	·26	·29
25	·38	·37	·35	·33	·31	·31	·31	·33	·35	·37	·38	·42
28	·51	·49	·47	·45	·42	·41	·42	·45	·47	·49	·51	·55
July 1	+ ·64	+ ·61	+ ·57	+ ·54	+ ·51	+ ·51	+ ·51	+ ·54	+ ·57	+ ·61	+ ·64	+ ·67
4	·75	·72	·68	·64	·61	·60	·61	·64	·68	·72	·75	·81
7	·86	·82	·78	·74	·70	·69	·70	·74	·78	·82	·86	·93
10	·97	·93	·88	·84	·79	·79	·79	·84	·88	·93	·97	1·06
13	1·07	1·03	·98	·93	·88	·87	·88	·93	·98	1·03	1·07	1·16
16	+1·16	+1·12	+1·07	+1·02	+ ·96	+ ·95	+ ·96	+1·02	+1·07	+1·12	+1·16	+1·27
19	1·25	1·20	1·14	1·08	1·03	1·01	1·03	1·08	1·14	1·20	1·25	1·36
22	1·33	1·28	1·22	1·15	1·09	1·08	1·09	1·15	1·22	1·28	1·33	1·45
25	1·40	1·34	1·28	1·21	1·15	1·13	1·15	1·21	1·28	1·34	1·40	1·52
28	1·46	1·40	1·34	1·27	1·20	1·18	1·20	1·27	1·34	1·40	1·46	1·59
31	+1·52	+1·45	+1·38	+1·31	+1·24	+1·22	+1·24	+1·31	+1·38	+1·45	+1·52	+1·65
Aug. 3	1·57	1·50	1·43	1·36	1·28	1·26	1·28	1·36	1·43	1·50	1·57	1·70
6	1·60	1·53	1·46	1·39	1·31	1·29	1·31	1·39	1·46	1·53	1·60	1·74
9	1·63	1·56	1·49	1·42	1·34	1·32	1·34	1·42	1·49	1·56	1·63	1·77
12	1·65	1·57	1·50	1·42	1·35	1·33	1·35	1·42	1·50	1·57	1·65	1·79
15	+1·65	+1·57	+1·50	+1·42	+1·35	+1·33	+1·35	+1·42	+1·50	+1·57	+1·65	+1·79
18	1·63	1·56	1·49	1·42	1·34	1·32	1·34	1·42	1·49	1·56	1·63	1·77
21	1·57	1·50	1·43	1·36	1·28	1·26	1·28	1·36	1·43	1·50	1·57	1·70
24	1·46	1·40	1·34	1·27	1·20	1·18	1·20	1·27	1·34	1·40	1·46	1·59
27	1·33	1·28	1·22	1·15	1·09	1·08	1·09	1·15	1·22	1·28	1·33	1·45
30	+1·16	+1·12	+1·07	+1·02	+ ·96	+ ·95	+ ·96	+1·02	+1·07	+1·12	+1·16	+1·27
Sept. 2	·97	·93	·88	·84	·79	·79	·79	·84	·88	·93	·97	1·06
5	·75	·72	·68	·64	·61	·60	·61	·64	·68	·72	·75	·81
8	·51	·49	·47	·45	·42	·41	·42	·45	·47	·49	·51	·55
11	·26	·25	·24	·23	·22	·21	·22	·23	·24	·25	·26	·29
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

Correction for time = − Correction for height. Example.—August 15 and 2h 30m = + 2·40 feet and − 16m.

DUBLAT.

Freshets Correction (Low Water Heights). Arguments—Date and Approximate Apparent Time of Moon's Transit.

Moon's Transit	0h 0m	0h 30m	1h 0m	1h 30m	2h 0m	2h 30m	3h 0m	3h 30m	4h 0m	4h 30m	5h 0m	5h 30m	6h 0m	6h 30m	7h 0m	7h 30m	8h 0m	8h 30m	9h 0m	9h 30m	10h 0m	10h 30m	11h 0m	11h 30m	12h 0m
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	+ .08	+ .07	+ .06	+ .05	+ .05	+ .05	+ .05	+ .05	+ .06	+ .07	+ .08	+ .08	+ .09	+ .10	+ .10	+ .10	+ .10	+ .10	+ .10	+ .10	+ .10	+ .10	+ .09	+ .08	+ .08
22	.15	.14	.13	.12	.11	.10	.11	.12	.13	.14	.15	.16	.18	.19	.20	.21	.21	.21	.21	.21	.20	.19	.18	.16	.15
25	.22	.20	.18	.17	.16	.15	.16	.17	.18	.20	.22	.24	.26	.28	.29	.30	.30	.30	.30	.30	.29	.28	.26	.24	.22
28	.30	.27	.25	.23	.21	.20	.21	.23	.25	.27	.30	.32	.35	.37	.39	.40	.40	.40	.40	.40	.39	.37	.35	.32	.30
July 1	+ .37	+ .33	+ .30	+ .28	+ .26	+ .24	+ .26	+ .28	+ .30	+ .33	+ .37	+ .40	+ .43	+ .46	+ .48	+ .49	+ .49	+ .49	+ .49	+ .49	+ .48	+ .46	+ .43	+ .40	+ .37
4	.43	.40	.36	.33	.30	.29	.30	.33	.36	.40	.43	.47	.50	.54	.56	.58	.58	.58	.58	.58	.56	.54	.50	.47	.43
7	.50	.46	.42	.38	.35	.33	.35	.38	.42	.46	.50	.54	.58	.62	.65	.67	.67	.67	.67	.67	.65	.62	.58	.54	.50
10	.57	.52	.47	.43	.40	.38	.40	.43	.47	.52	.57	.61	.66	.69	.74	.76	.76	.76	.76	.76	.74	.69	.66	.61	.57
13	.62	.57	.52	.48	.44	.42	.44	.48	.52	.57	.62	.68	.73	.78	.81	.83	.83	.83	.83	.83	.81	.78	.73	.68	.62
16	+ .68	+ .62	+ .57	+ .52	+ .47	+ .45	+ .47	+ .52	+ .57	+ .62	+ .68	+ .74	+ .80	+ .85	+ .89	+ .92	+ .92	+ .92	+ .92	+ .92	+ .89	+ .85	+ .80	+ .74	+ .68
19	.73	.67	.61	.56	.51	.49	.51	.56	.61	.67	.73	.79	.85	.91	.95	.98	.98	.98	.98	.98	.95	.91	.85	.79	.73
22	.78	.71	.65	.59	.54	.52	.54	.59	.65	.71	.78	.84	.91	.97	1.01	1.04	1.04	1.04	1.04	1.04	1.01	.97	.91	.84	.78
25	.82	.75	.68	.62	.57	.54	.57	.62	.68	.75	.82	.88	.95	1.02	1.06	1.09	1.09	1.09	1.09	1.09	1.06	1.02	.95	.88	.82
28	.85	.78	.71	.65	.59	.57	.59	.65	.71	.78	.85	.94	1.01	1.08	1.13	1.16	1.16	1.16	1.16	1.16	1.13	1.08	1.01	.94	.85
31	+ .88	+ .81	+ .74	+ .67	+ .61	+ .59	+ .61	+ .67	+ .74	+ .81	+ .88	+ .96	+ 1.03	+ 1.10	+ 1.15	+ 1.18	+ 1.18	+ 1.18	+ 1.18	+ 1.18	+ 1.15	+ 1.10	+ 1.03	+ .96	+ .88
Aug. 3	.91	.84	.76	.69	.62	.61	.62	.69	.76	.84	.91	.99	1.06	1.14	1.19	1.22	1.22	1.22	1.22	1.22	1.19	1.14	1.06	.99	.91
6	.93	.85	.78	.70	.65	.62	.65	.70	.78	.85	.93	1.01	1.09	1.16	1.21	1.24	1.24	1.24	1.24	1.24	1.21	1.16	1.09	1.01	.93
9	.95	.87	.79	.71	.66	.63	.66	.71	.79	.87	.95	1.03	1.11	1.19	1.24	1.27	1.27	1.27	1.27	1.27	1.24	1.19	1.11	1.03	.95
12	.96	.88	.80	.72	.67	.64	.67	.72	.80	.88	.96	1.04	1.12	1.20	1.25	1.28	1.28	1.28	1.28	1.28	1.25	1.20	1.12	1.04	.96
15	+ .96	+ .88	+ .80	+ .72	+ .67	+ .64	+ .67	+ .72	+ .80	+ .88	+ .96	+ 1.04	+ 1.12	+ 1.20	+ 1.25	+ 1.28	+ 1.28	+ 1.28	+ 1.28	+ 1.28	+ 1.25	+ 1.20	+ 1.12	+ 1.04	+ .96
18	.95	.87	.79	.71	.66	.63	.66	.71	.79	.87	.95	1.03	1.11	1.19	1.24	1.27	1.27	1.27	1.27	1.27	1.24	1.19	1.11	1.03	.95
21	.91	.84	.76	.69	.62	.61	.62	.69	.76	.84	.91	.99	1.06	1.14	1.19	1.22	1.22	1.22	1.22	1.22	1.19	1.14	1.06	.99	.91
24	.85	.78	.71	.65	.59	.57	.59	.65	.71	.78	.85	.94	1.01	1.08	1.13	1.16	1.16	1.16	1.16	1.16	1.13	1.08	1.01	.94	.85
27	.78	.71	.65	.59	.54	.52	.54	.59	.65	.71	.78	.84	.91	.97	1.01	1.04	1.04	1.04	1.04	1.04	1.01	.97	.91	.84	.78
30	+ .68	+ .62	+ .57	+ .52	+ .47	+ .45	+ .47	+ .52	+ .57	+ .62	+ .68	+ .74	+ .80	+ .85	+ .89	+ .92	+ .92	+ .92	+ .92	+ .92	+ .89	+ .85	+ .80	+ .74	+ .68
Sept. 2	.57	.52	.47	.43	.40	.38	.40	.43	.47	.52	.57	.61	.66	.69	.74	.76	.76	.76	.76	.76	.74	.69	.66	.61	.57
5	.43	.40	.36	.33	.30	.29	.30	.33	.36	.40	.43	.47	.50	.54	.56	.58	.58	.58	.58	.58	.56	.54	.50	.47	.43
8	.30	.27	.25	.23	.21	.20	.21	.23	.25	.27	.30	.32	.35	.37	.39	.40	.40	.40	.40	.40	.39	.37	.35	.32	.30
11	.15	.14	.13	.12	.11	.10	.11	.12	.13	.14	.15	.16	.18	.19	.20	.21	.21	.21	.21	.21	.20	.20	.18	.16	.15
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DIAMOND HARBOUR.

Freshets Correction (High Water Heights). Arguments—Date and Approximate Apparent Time of Moon's Transit.

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·22	+ ·23	+ ·24	+ ·25	+ ·26	+ ·27	+ ·27	+ ·27	+ ·26	+ ·25	+ ·23	+ ·21	+ ·19	+ ·18	+ ·18	+ ·17	+ ·17	+ ·17	+ ·17	+ ·17	+ ·18	+ ·18	+ ·19	+ ·20	+ ·22
22	·43	·46	·48	·50	·52	·53	·54	·54	·53	·49	·46	·42	·39	·37	·35	·34	·34	·34	·34	·34	·35	·37	·38	·41	·43
25	·62	·66	·69	·72	·75	·77	·78	·78	·76	·71	·66	·60	·56	·53	·51	·49	·49	·52	·49	·49	·51	·53	·55	·58	·62
28	·84	·89	·93	·97	1·00	1·03	1·04	1·05	1·02	·95	·88	·81	·75	·70	·68	·67	·66	·66	·66	·67	·68	·70	·74	·79	·84
July 1	+1·03	+1·09	+1·14	+1·19	+1·23	+1·27	+1·28	+1·29	+1·25	+1·17	+1·08	+1·00	+ ·92	+ ·87	+ ·84	+ ·82	+ ·81	+ ·81	+ ·81	+ ·82	+ ·84	+ ·87	+ ·91	+ ·97	+1·03
4	1·22	1·30	1·35	1·40	1·45	1·50	1·52	1·53	1·50	1·38	1·28	1·18	1·09	1·03	·99	·97	·96	·96	·96	·97	·99	1·03	1·18	1·15	1·22
7	1·41	1·53	1·59	1·65	1·71	1·76	1·78	1·80	1·75	1·63	1·51	1·36	1·26	1·19	1·17	1·12	1·11	1·10	1·11	1·12	1·17	1·19	1·27	1·35	1·41
10	1·59	1·70	1·77	1·84	1·91	1·97	1·99	2·01	1·95	1·81	1·68	1·54	1·43	1·35	1·30	1·27	1·26	1·25	1·26	1·27	1·30	1·35	1·42	1·50	1·59
13	1·76	1·87	1·95	2·03	2·10	2·17	2·19	2·21	2·15	2·00	1·85	1·70	1·57	1·48	1·43	1·40	1·39	1·38	1·39	1·40	1·43	1·48	1·56	1·66	1·76
16	+1·93	+2·04	+2·13	+2·22	+2·30	+2·37	+2·39	+2·41	+2·34	+2·19	+2·02	+1·86	+1·72	+1·62	+1·56	+1·53	+1·52	+1·51	+1·52	+1·53	+1·56	+1·62	+1·70	+1·83	+1·93
19	2·06	2·19	2·28	2·37	2·45	2·53	2·56	2·58	2·51	2·34	2·17	1·99	1·84	1·73	1·67	1·63	1·63	1·62	1·63	1·63	1·67	1·73	1·82	1·94	2·06
22	2·20	2·33	2·43	2·52	2·61	2·70	2·73	2·75	2·67	2·49	2·31	2·13	1·96	1·84	1·78	1·74	1·74	1·73	1·74	1·74	1·78	1·84	1·94	2·07	2·20
25	2·30	2·45	2·55	2·65	2·74	2·83	2·86	2·89	2·81	2·62	2·42	2·23	2·06	1·94	1·87	1·83	1·82	1·81	1·82	1·83	1·87	1·94	2·04	2·17	2·30
28	2·41	2·59	2·70	2·80	2·90	3·00	3·03	3·06	2·97	2·77	2·57	2·33	2·15	2·03	1·98	1·91	1·90	1·89	1·90	1·91	1·98	2·03	2·17	2·27	2·41
31	+2·49	+2·68	+2·79	+2·89	+3·00	+3·10	+3·14	+3·17	+3·07	+2·86	+2·65	+2·41	+2·23	+2·10	+2·02	+1·98	+1·97	+1·96	+1·97	+1·98	+2·02	+2·10	+2·21	+2·35	+2·49
Aug. 3	2·57	2·74	2·85	2·96	3·07	3·17	3·20	3·23	3·14	2·93	2·71	2·49	2·30	2·17	2·09	2·04	2·03	2·02	2·03	2·04	2·09	2·17	2·28	2·42	2·57
6	2·63	2·78	2·91	3·02	3·13	3·23	3·26	3·29	3·20	2·99	2·76	2·54	2·35	2·21	2·13	2·09	2·08	2·07	2·08	2·09	2·13	2·21	2·33	2·47	2·63
9	2·68	2·85	2·97	3·09	3·20	3·30	3·34	3·37	3·27	3·05	2·81	2·59	2·40	2·26	2·18	2·13	2·12	2·11	2·12	2·13	2·18	2·26	2·38	2·52	2·68
12	2·71	2·88	3·00	3·12	3·24	3·34	3·38	3·40	3·30	3·08	2·85	2·62	2·42	2·28	2·20	2·15	2·14	2·13	2·14	2·15	2·20	2·28	2·40	2·55	2·71
15	+2·71	+2·88	+3·00	+3·12	+3·24	+3·34	+3·38	+3·40	+3·30	+3·08	+2·85	+2·62	+2·42	+2·28	+2·20	+2·15	+2·14	+2·13	+2·14	+2·15	+2·20	+2·28	+2·40	+2·55	+2·71
18	2·68	2·85	2·97	3·09	3·20	3·30	3·34	3·37	3·27	3·05	2·81	2·59	2·40	2·26	2·18	2·13	2·12	2·11	2·12	2·13	2·18	2·26	2·38	2·52	2·68
21	2·57	2·74	2·85	2·96	3·07	3·17	3·20	3·23	3·14	2·93	2·71	2·49	2·30	2·17	2·09	2·04	2·03	2·02	2·03	2·04	2·09	2·17	2·28	2·42	2·57
24	2·41	2·59	2·70	2·80	2·90	3·00	3·03	3·06	2·97	2·77	2·57	2·33	2·15	2·03	1·98	1·91	1·90	1·89	1·90	1·91	1·98	2·03	2·17	2·27	2·41
27	2·20	2·33	2·43	2·52	2·61	2·70	2·73	2·75	2·67	2·49	2·31	2·13	1·96	1·84	1·78	1·74	1·74	1·73	1·74	1·74	1·78	1·84	1·94	2·07	2·20
30	+1·93	+2·04	+2·13	+2·22	+2·30	+2·37	+2·39	+2·41	+2·34	+2·19	+2·02	+1·86	+1·72	+1·62	+1·56	+1·53	+1·52	+1·51	+1·52	+1·53	+1·56	+1·62	+1·70	+1·83	+1·93
Sept. 2	1·59	1·70	1·77	1·84	1·91	1·97	1·99	2·01	1·95	1·81	1·68	1·54	1·43	1·35	1·30	1·27	1·26	1·25	1·26	1·27	1·30	1·35	1·42	1·50	1·59
5	1·22	1·30	1·35	1·40	1·45	1·50	1·52	1·53	1·50	1·38	1·28	1·18	1·09	1·03	·99	·97	·96	·96	·96	·97	·99	1·03	1·18	1·15	1·22
8	·84	·89	·93	·97	1·00	1·03	1·04	1·05	1·02	·95	·88	·81	·75	·70	·68	·67	·66	·66	·66	·67	·68	·70	·74	·79	·84
11	·43	·46	·48	·50	·52	·53	·54	·34	·53	·49	·46	·42	·39	·37	·35	·34	·34	·34	·34	·34	·35	·37	·38	·41	·43
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

DIAMOND HARBOUR.

Freshets Correction (Low Water Heights). Arguments—Date and Approximate Apparent Time of Moon's Transit.

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00	+ ·00
19	·07	·06	·06	·06	·06	·06	·06	·06	·06	·07	·07	·08	·09	·09	·11	·12	·13	·13	·12	·11	·10	·09	·08	·07	·07
22	·13	·13	·12	·12	·12	·12	·12	·12	·13	·14	·15	·16	·17	·19	·21	·24	·26	·26	·25	·23	·20	·17	·16	·14	·13
25	·19	·18	·18	·17	·17	·17	·17	·17	·18	·20	·21	·22	·25	·27	·30	·35	·37	·38	·36	·32	·29	·25	·22	·20	·19
28	·26	·25	·24	·23	·23	·23	·23	·24	·25	·26	·28	·31	·33	·37	·41	·47	·50	·51	·48	·44	·39	·33	·30	·27	·26
July 1	+ ·32	+ ·30	+ ·29	+ ·29	+ ·29	+ ·29	+ ·29	+ ·29	+ ·30	+ ·32	+ ·35	+ ·38	+ ·41	+ ·45	+ ·50	+ ·57	+ ·61	+ ·62	+ ·59	+ ·53	+ ·48	+ ·41	+ ·37	+ ·33	+ ·32
4	·37	·36	·35	·34	·34	·34	·34	·34	·36	·38	·41	·45	·49	·53	·59	·68	·72	·74	·70	·63	·56	·49	·44	·39	·37
7	·43	·42	·40	·39	·39	·39	·39	·40	·42	·44	·47	·51	·56	·61	·69	·78	·83	·85	·81	·73	·65	·56	·50	·45	·43
10	·49	·47	·45	·44	·44	·44	·44	·45	·47	·50	·54	·58	·64	·70	·78	·90	·94	·97	·91	·83	·74	·64	·57	·52	·49
13	·54	·52	·50	·49	·49	·49	·49	·49	·52	·55	·59	·64	·70	·77	·86	·98	1·04	1·07	1·01	·91	·81	·70	·63	·57	·54
16	+ ·59	+ ·57	+ ·55	+ ·53	+ ·53	+ ·53	+ ·53	+ ·54	+ ·57	+ ·60	+ ·65	+ ·70	+ ·77	+ ·84	+ ·94	+1·07	+1·14	+1·16	+1·10	+1·00	+ ·89	+ ·77	+ ·69	+ ·62	+ ·59
19	·63	·61	·59	·57	·57	·57	·57	·58	·61	·65	·69	·75	·82	·90	1·01	1·14	1·22	1·25	1·18	1·07	·95	·82	·74	·66	·63
22	·68	·65	·62	·61	·61	·61	·61	·61	·65	·69	·74	·80	·87	·96	1·07	1·22	1·30	1·33	1·26	1·14	1·01	·87	·79	·72	·68
25	·71	·68	·65	·64	·64	·64	·64	·64	·68	·72	·77	·84	·92	1·00	1·12	1·28	1·36	1·39	1·32	1·20	1·06	·92	·82	·74	·71
28	·74	·72	·69	·68	·68	·68	·68	·67	·72	·76	·81	·88	·96	1·05	1·18	1·34	1·42	1·46	1·38	1·25	1·11	·96	·86	·77	·74
31	+ ·76	+ ·74	+ ·71	+ ·69	+ ·69	+ ·69	+ ·69	+ ·70	+ ·74	+ ·78	+ ·84	+ ·91	+ ·99	+1·09	+1·22	+1·38	+1·47	+1·51	+1·43	+1·30	+1·15	+ ·99	+ ·89	+ ·80	+ ·76
Aug. 3	·79	·76	·73	·71	·71	·71	·71	·72	·76	·81	·86	·94	1·03	1·12	1·26	1·43	1·52	1·56	1·47	1·34	1·19	1·03	·92	·83	·79
6	·81	·77	·75	·73	·73	·73	·73	·74	·77	·82	·88	·96	1·05	1·15	1·28	1·46	1·55	1·59	1·51	1·37	1·21	1·05	·94	·84	·81
9	·82	·79	·76	·74	·74	·74	·74	·75	·79	·84	·90	·98	1·07	1·17	1·31	1·49	1·58	1·62	1·53	1·40	1·24	1·07	·96	·86	·82
12	·83	·80	·77	·75	·75	·75	·75	·76	·80	·85	·91	·99	1·08	1·18	1·32	1·50	1·60	1·64	1·55	1·41	1·25	1·08	·97	·87	·83
15	+ ·83	+ ·80	+ ·77	+ ·75	+ ·75	+ ·75	+ ·75	+ ·76	+ ·80	+ ·85	+ ·91	+ ·99	+1·08	+1·18	+1·32	+1·50	+1·60	+1·64	+1·55	+1·41	+1·25	+1·08	+ ·97	+ ·87	+ ·83
18	·82	·79	·76	·74	·74	·74	·74	·75	·79	·84	·90	·98	1·07	1·17	1·31	1·49	1·58	1·52	1·53	1·40	1·24	1·07	·96	·86	·82
21	·79	·76	·73	·71	·71	·71	·71	·72	·76	·81	·86	·94	1·03	1·12	1·26	1·43	1·52	1·56	1·47	1·34	1·19	1·03	·92	·83	·79
24	·74	·72	·69	·68	·68	·68	·68	·67	·72	·76	·81	·88	·96	1·05	1·18	1·34	1·42	1·46	1·38	1·25	1·11	·96	·86	·77	·74
27	·68	·65	·62	·61	·61	·61	·61	·61	·65	·69	·74	·80	·87	·96	1·07	1·22	1·30	1·33	1·26	1·14	1·00	·87	·79	·72	·68
30	+ ·59	+ ·57	+ ·55	+ ·53	+ ·53	+ ·53	+ ·53	+ ·54	+ ·57	+ ·60	+ ·65	+ ·70	+ ·77	+ ·84	+ ·94	+1·07	+1·14	+1·16	+1·10	+1·00	+ ·89	+ ·77	+ ·69	+ ·62	+ ·59
Sept. 2	·49	·47	·45	·44	·44	·44	·44	·45	·47	·50	·54	·58	·64	·70	·78	·90	·94	·97	·91	·83	·74	·64	·57	·52	·49
5	·37	·36	·35	·34	·34	·34	·34	·34	·36	·38	·41	·45	·49	·53	·59	·68	·72	·74	·70	·63	·56	·49	·44	·39	·37
8	·26	·25	·24	·23	·23	·23	·23	·24	·25	·26	·28	·31	·33	·37	·41	·47	·50	·51	·48	·44	·39	·33	·30	·27	·26
11	·13	·13	·12	·12	·12	·12	·12	·12	·13	·14	·15	·16	·17	·19	·21	·24	·26	·26	·25	·23	·20	·17	·16	·14	·13
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

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Freshets Correction (High Water Times). Arguments—Date and Approximate Apparent Time of Moon's Transit.

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	1	2	2	2	2	2	3	3	3	3	4	5	5	5	5	4	4	3	2	2	1	1	1	1	1
22	3	4	4	4	4	5	5	6	6	7	9	10	10	9	9	9	8	6	5	4	3	2	2	1	3
25	4	5	5	6	6	7	8	8	9	10	13	14	14	13	13	13	11	8	7	5	5	4	4	3	4
28	6	6	7	8	9	9	10	11	12	13	17	19	19	18	18	17	15	11	9	7	6	5	5	5	6
July 1	7	8	9	10	11	11	13	13	15	16	21	24	23	22	22	21	18	14	11	9	8	6	6	6	7
4	8	9	10	11	13	14	15	16	17	19	25	28	27	27	26	25	22	16	13	10	9	8	8	7	8
7	9	11	12	13	15	16	17	18	20	22	29	32	32	31	30	29	25	19	15	12	10	9	9	8	9
10	11	12	14	15	17	18	19	21	22	25	32	37	36	35	34	32	28	21	17	14	12	10	10	9	11
13	12	13	15	16	18	20	21	23	25	28	35	40	40	38	37	35	31	23	19	15	13	11	11	9	12
16	13	15	16	18	20	21	23	25	27	30	39	44	43	42	40	39	34	26	21	16	14	12	12	11	13
19	14	16	17	19	21	23	25	27	29	33	42	47	46	45	43	42	36	27	22	17	15	13	13	12	14
22	15	17	19	20	23	24	27	28	31	35	45	50	49	48	46	45	39	29	23	19	16	14	14	13	15
25	15	18	20	21	24	26	28	30	32	37	47	53	52	50	49	47	41	31	25	20	17	14	14	14	15
28	16	19	20	22	25	27	29	31	34	38	49	55	54	53	51	49	43	32	26	20	17	15	15	14	16
31	17	19	21	23	26	28	30	32	35	40	51	57	56	54	52	51	44	33	27	21	18	16	16	15	17
Aug. 3	17	20	22	24	27	29	31	33	36	41	52	59	58	56	54	52	46	34	28	22	19	16	16	15	17
6	17	20	22	24	27	29	32	34	37	42	53	60	59	57	55	53	47	35	28	22	19	16	16	16	17
9	18	21	23	25	28	30	33	35	38	43	54	61	60	58	56	54	48	36	29	23	20	17	17	16	18
12	18	21	23	25	28	30	33	35	38	43	55	62	61	59	57	55	48	36	29	23	20	17	17	16	18
15	18	21	23	25	28	30	33	35	38	43	55	62	61	59	57	55	48	36	29	23	20	17	17	16	18
18	18	21	23	25	28	30	33	35	38	43	54	61	60	58	56	54	48	36	29	23	20	17	17	16	18
21	17	20	22	24	27	29	31	33	36	41	52	59	58	56	54	52	46	34	28	22	19	16	16	15	17
24	16	19	20	22	25	27	29	31	34	38	49	55	54	53	51	49	43	32	26	20	17	15	15	14	16
27	15	17	19	20	23	24	27	28	31	35	45	50	49	48	46	45	39	29	23	19	16	14	14	13	15
30	13	15	16	18	20	21	23	25	27	30	39	44	43	42	40	39	34	26	21	16	14	12	12	11	13
Sept. 2	11	12	14	15	17	18	19	21	22	25	32	37	36	35	34	32	28	21	17	14	12	10	10	9	11
5	8	9	10	11	13	14	15	16	17	19	25	28	27	27	26	25	22	16	13	10	9	8	8	7	8
8	6	6	7	8	9	9	10	11	12	13	17	19	19	18	18	17	15	11	9	7	6	5	5	5	6
11	3	4	4	4	4	5	5	6	6	7	9	10	10	9	9	9	8	6	5	4	3	2	2	1	3
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Freshets Correction (Low Water Times). Argument—Date and Approximate Apparent Time of Moon's Transit.

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	− 1	− 1	− 1	− 1	− 1	0	0	0	0	0	0	− 1	− 1	− 1	− 2	− 2	− 2	− 2	− 2	− 2	− 2	− 1	− 1	− 1	− 1
22	2	2	2	1	1	− 1	0	0	0	0	− 1	1	2	2	3	4	4	4	4	4	3	1	2	2	2
25	3	2	2	2	2	1	− 1	0	0	− 1	1	2	2	3	4	5	6	6	6	5	4	3	3	3	3
28	4	3	3	2	2	2	1	− 1	− 1	1	2	2	3	5	6	7	8	8	8	7	6	5	4	4	4
July 1	− 5	− 4	− 4	− 3	− 3	− 2	− 1	− 1	− 1	− 1	− 2	− 3	− 4	− 6	− 7	− 8	− 10	− 10	− 10	− 8	− 7	− 6	− 5	− 5	− 5
4	5	5	5	4	3	3	1	1	1	1	3	4	5	7	9	10	11	12	11	10	9	7	6	6	5
7	6	6	5	4	4	3	2	1	1	2	3	4	6	8	10	11	13	14	13	11	10	8	7	7	6
10	7	6	6	5	4	3	2	1	1	2	3	5	6	9	11	13	15	16	15	13	11	9	8	8	7
13	8	7	7	5	5	3	2	1	1	2	3	5	7	10	12	14	16	18	16	14	12	9	9	8	8
16	− 9	− 8	− 7	− 6	− 5	− 4	− 2	− 1	− 1	− 2	− 4	− 6	− 8	− 11	− 13	− 15	− 18	− 19	− 18	− 15	− 13	− 11	− 10	− 9	− 9
19	9	8	8	6	5	4	2	2	2	2	4	6	8	12	15	17	19	21	19	17	15	12	11	10	9
22	10	9	8	6	6	4	2	2	2	2	4	6	9	12	15	18	20	22	20	18	15	13	11	11	10
25	10	9	9	7	6	4	3	2	2	2	4	7	9	13	16	19	21	23	21	19	16	14	12	12	10
28	11	10	9	7	6	4	3	2	2	3	4	7	10	13	17	20	22	24	22	20	17	14	12	12	11
31	− 11	− 10	− 9	− 7	− 6	− 5	− 3	− 2	− 2	− 3	− 5	− 7	− 10	− 14	− 17	− 20	− 23	− 25	− 23	− 20	− 17	− 15	− 13	− 12	− 11
Aug. 3	11	10	10	8	7	5	3	2	2	3	5	8	10	14	18	21	24	26	24	21	18	15	13	12	11
6	12	11	10	8	7	5	3	2	2	3	5	8	11	14	18	21	24	26	24	21	18	16	14	13	12
9	12	11	10	8	7	5	3	2	2	3	5	8	11	15	19	22	25	27	25	22	19	16	14	13	12
12	12	11	10	8	7	5	3	2	2	3	5	8	11	15	19	22	25	27	25	22	19	16	14	13	12
15	− 12	− 11	− 10	− 8	− 7	− 5	− 3	− 2	− 2	− 3	− 5	− 8	− 11	− 15	− 19	− 22	− 25	− 27	− 25	− 22	− 19	− 16	− 14	− 13	− 12
18	12	11	10	8	7	5	3	2	2	3	5	8	11	15	19	22	25	27	25	22	19	16	14	13	12
21	11	10	10	8	7	5	3	2	2	3	5	8	10	14	18	21	24	26	24	21	18	15	13	12	11
24	11	10	9	7	6	4	3	2	2	3	4	7	10	13	17	20	22	24	22	20	17	14	12	12	11
27	10	9	8	6	6	4	2	2	2	2	4	6	9	12	15	18	20	22	20	18	15	13	11	11	10
30	− 9	− 8	− 7	− 6	− 5	− 4	− 2	− 1	− 1	− 2	− 4	− 6	− 8	− 11	− 13	− 15	− 18	− 19	− 18	− 15	− 13	− 11	− 10	− 9	− 9
Sept. 2	7	6	6	5	7	3	2	1	1	2	3	5	6	9	11	13	15	16	15	13	11	9	8	8	7
5	5	5	5	4	3	3	1	1	1	1	3	4	5	7	9	10	11	12	11	10	9	7	6	6	5
8	4	3	3	2	2	2	1	1	1	1	2	2	3	5	6	7	8	8	8	7	6	5	4	4	4
11	2	2	2	1	1	1	0	0	0	0	1	1	2	2	3	4	4	4	4	4	3	3	2	2	2
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Freshets Correction (High Water Heights). Argument—Date and Approximate Apparent Time of Moon's Transit.

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·40	+ ·42	+ ·44	+ ·46	+ ·48	+ ·48	+ ·48	+ ·48	+ ·47	+ ·45	+ ·43	+ ·40	+ ·38
22	·81	·84	·87	·91	·95	·97	·97	·96	·94	·90	·86	·81	·77
25	1·17	1·21	1·25	1·31	1·37	1·39	1·39	1·39	1·36	1·30	1·23	1·16	1·10
28	1·57	1·63	1·69	1·77	1·84	1·88	1·88	1·87	1·83	1·75	1·66	1·56	1·49
July 1	+1·93	+2·00	+2·07	+2·17	+2·26	+2·30	+2·30	+2·29	+2·24	+2·15	+2·04	+1·92	+1·82
4	2·28	2·36	2·45	2·57	2·68	2·73	2·73	2·71	2·66	2·54	2·41	2·27	2·16
7	2·69	2·78	2·89	3·02	3·15	3·21	3·21	3·20	3·13	2·99	2·84	2·67	2·54
10	2·99	3·10	3·22	3·36	3·51	3·58	3·58	3·56	3·48	3·33	3·16	2·97	2·83
13	3·29	3·41	3·54	3·70	3·87	3·94	3·94	3·92	3·84	3·67	3·48	3·28	3·12
16	+3·60	+3·73	+3·87	+4·05	+4·22	+4·30	+4·30	+4·28	+4·19	+4·01	+3·81	+3·58	+3·41
19	3·85	3·99	4·14	4·33	4·52	4·61	4·61	4·58	4·48	4·29	4·07	3·83	3·65
22	4·11	4·25	4·41	4·62	4·82	4·91	4·91	4·88	4·78	4·58	4·34	4·08	3·89
25	4·31	4·46	4·63	4·85	5·06	5·15	5·15	5·13	5·02	4·80	4·56	4·28	4·08
28	4·51	4·67	4·85	5·07	5·30	5·39	5·39	5·37	5·25	5·03	4·77	4·49	4·27
31	+4·66	+4·83	+5·01	+5·24	+5·47	+5·58	+5·58	+5·55	+5·43	+5·20	+4·93	+4·64	+4·42
Aug. 3	4·82	4·99	5·18	5·42	5·65	5·76	5·76	5·73	5·61	5·37	5·09	4·79	4·56
6	4·92	5·09	5·29	5·53	5·77	5·88	5·88	5·85	5·72	5·48	5·20	4·89	4·66
9	5·02	5·20	5·40	5·64	5·89	6·00	6·00	5·97	5·84	5·59	5·31	4·99	4·75
12	5·07	5·25	5·45	5·70	5·95	6·06	6·06	6·03	5·90	5·65	5·36	5·04	4·80
15	+5·07	+5·25	+5·45	+5·70	+5·95	+6·06	+6·06	+6·03	+5·90	+5·65	+5·36	+5·04	+4·80
18	5·02	5·20	5·40	5·64	5·89	6·00	6·00	5·97	5·84	5·59	5·31	4·99	4·75
21	4·82	4·99	5·18	5·42	5·65	5·76	5·76	5·73	5·61	5·37	5·09	4·79	4·56
24	4·51	4·67	4·85	5·07	5·30	5·39	5·39	5·37	5·25	5·03	4·77	4·49	4·27
27	4·11	4·25	4·41	4·62	4·82	4·91	4·91	4·88	4·78	4·58	4·34	4·08	3·89
30	+3·60	+3·73	+3·87	+4·05	+4·22	+4·30	+4·30	+4·28	+4·19	+4·01	+3·88	+3·58	+3·41
Sept. 2	2·99	3·10	3·22	3·36	3·51	3·58	3·58	3·56	3·48	3·33	3·16	2·97	3·83
5	2·28	2·36	2·45	2·57	2·68	2·73	2·73	2·71	2·66	2·54	2·41	2·27	2·16
8	1·57	1·63	1·69	1·77	1·84	1·88	1·88	1·87	1·83	1·75	1·66	1·56	1·49
11	·81	·84	·87	·91	·95	·97	·97	·96	·94	·90	·86	·81	·77
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

Moon's Transit	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·37	+ ·37	+ ·38	+ ·38	+ ·38	+ ·38	+ ·38	+ ·39	+ ·39	+ ·39	+ ·40	+ ·40
22	·75	·75	·75	·76	·76	·76	·77	·77	·77	·78	·79	·81
25	1·08	1·08	1·08	1·09	1·10	1·10	1·10	1·11	1·11	1·12	1·14	1·17
28	1·45	1·45	1·46	1·47	1·48	1·48	1·49	1·49	1·50	1·52	1·53	1·57
July 1	+1·78	+1·78	+1·79	+1·80	+1·81	+1·81	+1·82	+1·83	+1·84	+1·86	+1·88	+1·93
4	2·11	2·11	2·12	2·13	2·15	2·15	2·16	2·17	2·18	2·20	2·23	2·28
7	2·48	2·48	2·50	2·51	2·53	2·54	2·54	2·55	2·57	2·59	2·62	2·69
10	2·76	2·76	2·78	2·80	2·81	2·82	2·83	2·84	2·86	2·89	2·92	2·99
13	3·04	3·04	3·06	3·08	3·10	3·11	3·12	3·13	3·15	3·18	3·22	3·30
16	+3·32	+3·32	+3·34	+3·37	+3·39	+3·40	+3·41	+3·42	+3·44	+3·47	+3·51	+3·60
19	3·56	3·56	3·58	3·60	3·63	3·64	3·65	3·66	3·68	3·72	3·76	3·85
22	3·79	3·79	3·82	3·84	3·86	3·87	3·89	3·90	3·92	3·96	4·01	4·11
25	3·98	3·98	4·00	4·03	4·05	4·06	4·08	4·10	4·11	4·16	4·21	4·31
28	4·17	4·17	4·19	4·22	4·25	4·26	4·27	4·29	4·31	4·35	4·41	4·51
31	+4·31	+4·31	+4·33	+4·36	+4·39	+4·40	+4·42	+4·43	+4·45	+4·50	+4·55	+4·66
Aug. 3	4·45	4·45	4·47	4·50	4·53	4·54	4·56	4·58	4·60	4·65	4·70	4·82
6	4·54	4·54	4·57	4·60	4·63	4·64	4·66	4·68	4·69	4·74	4·80	4·92
9	4·63	4·63	4·66	4·69	4·72	4·73	4·75	4·77	4·79	4·84	4·90	5·02
12	4·68	4·68	4·71	4·74	4·77	4·78	4·80	4·82	4·84	4·89	4·95	5·07
15	+4·68	+4·63	+4·71	+4·74	+4·77	+4·78	+4·80	+4·82	+4·84	+4·89	+4·95	+5·07
18	4·63	4·68	4·66	4·69	4·72	4·73	4·75	4·77	4·79	4·84	4·90	5·02
21	4·45	4·45	4·47	4·50	4·53	4·54	4·56	4·58	4·60	4·65	4·70	4·82
24	4·17	4·17	4·19	4·22	4·25	4·26	4·27	4·29	4·31	4·35	4·41	4·51
27	3·79	3·79	3·82	3·84	3·86	3·87	3·89	3·90	3·92	3·96	4·01	4·11
30	+3·32	+3·32	+3·34	+3·37	+3·39	+3·40	+3·41	+3·42	+3·44	+3·47	+3·51	+3·60
Sept. 2	2·76	2·76	2·78	3·80	2·81	2·82	2·83	2·84	2·86	2·89	2·92	2·99
5	2·11	2·11	2·12	2·13	2·15	2·15	2·16	2·17	2·18	2·20	2·23	2·28
8	1·45	1·45	1·46	1·47	1·48	1·48	1·49	1·49	1·50	1·52	1·53	1·57
11	·75	·75	·75	·76	·76	·76	·77	·77	·77	·78	·79	·81
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

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Freshets Correction (Low Water Heights). Argument—Date only.

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 20	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37	+ ·37
22	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75
25	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07	1·07
28	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45	1·45
July 1	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77	+1·77
4	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10
7	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42	2·42
10	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75
13	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03	3·03
16	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31
19	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54	3·54
22	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77
25	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96	3·96
28	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15
31	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29	+4·29
Aug. 3	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43
6	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52
9	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61
12	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66	4·66
15	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66	+4·66
18	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61	4·61
21	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43	4·43
24	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15	4·15
27	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77	3·77
30	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31	+3·31
Sept. 2	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75	2·75
5	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10	2·10
8	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35	1·35
11	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75	·75
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

ELEPHANT POINT.

Corrections to Times of High Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	− 1	− 1	− 1	− 1	− 1	0	0	0	0	0	0	0	0	− 1	− 1	− 1	− 1	− 1	− 1	− 1	− 1	− 1	− 1	− 1	− 1
22	2	2	2	2	1	− 1	0	0	+ 1	+ 1	+ 1	0	0	2	2	2	2	3	3	3	3	2	2	2	2
25	3	3	3	2	2	1	0	0	1	1	1	0	0	2	3	3	3	4	4	4	4	3	3	3	3
28	4	3	4	3	2	2	0	0	2	2	2	0	− 1	2	3	4	5	5	5	5	5	5	5	4	4
July 1	− 5	− 4	− 5	− 4	− 3	− 2	0	0	+ 2	+ 2	+ 2	0	− 1	− 3	− 4	− 5	− 6	− 6	− 6	− 6	− 6	− 6	− 6	− 5	− 5
4	6	5	5	5	4	2	0	0	2	2	2	0	1	4	5	6	7	7	7	7	7	7	7	6	6
7	7	6	6	5	4	3	− 1	0	3	3	3	0	1	4	6	7	8	8	8	8	8	8	8	7	7
10	8	7	7	6	5	3	1	+ 1	3	3	3	+ 1	1	5	6	8	9	10	10	10	10	9	9	8	8
13	9	8	8	7	5	3	1	1	3	3	3	1	1	5	7	9	10	10	10	10	10	10	10	9	9
16	− 10	− 9	− 9	− 7	− 6	− 4	− 1	+ 1	+ 4	+ 4	+ 4	+ 1	− 2	− 6	− 8	− 10	− 11	− 11	− 11	− 11	− 11	− 11	− 11	− 10	− 10
19	11	9	9	8	6	4	1	1	4	5	4	1	2	6	8	11	11	12	12	12	12	11	11	11	11
22	11	10	10	8	6	4	1	1	4	5	4	1	2	6	9	11	12	13	13	13	13	12	12	11	11
25	12	10	10	9	7	4	1	1	4	5	4	1	2	7	9	12	13	14	14	14	14	13	13	12	12
28	12	11	11	9	7	4	1	2	4	6	4	2	2	7	10	12	13	14	14	14	14	13	13	12	12
31	− 13	− 11	− 11	− 9	− 7	− 5	− 1	+ 2	+ 5	+ 6	+ 5	+ 2	− 2	− 7	− 10	− 13	− 14	− 15	− 15	− 15	− 15	− 14	− 14	− 13	− 13
Aug. 3	13	11	11	10	8	5	1	2	5	6	5	2	2	8	10	13	14	15	15	15	15	14	14	13	13
6	14	12	12	10	8	5	1	2	5	6	5	2	2	8	11	14	15	16	16	16	16	15	15	14	14
9	14	12	12	10	8	5	1	2	5	6	5	2	2	8	11	14	15	16	16	16	16	15	15	14	14
12	14	12	12	10	8	5	1	2	5	6	5	2	3	8	11	14	15	16	16	16	16	15	15	14	14
15	− 14	− 13	− 12	− 10	− 8	− 5	− 1	+ 2	+ 5	+ 6	+ 5	+ 2	− 3	− 8	− 11	− 14	− 15	− 16	− 16	− 16	− 16	− 15	− 15	− 14	− 14
18	14	13	12	10	8	5	1	2	5	6	5	2	3	8	11	14	15	16	16	16	16	15	15	14	14
21	13	12	11	10	8	5	1	2	5	6	5	2	2	8	11	13	14	15	15	15	15	14	14	13	13
24	12	11	11	9	7	4	1	2	4	6	4	2	2	7	10	12	13	14	14	14	14	13	13	12	12
27	11	10	10	8	6	4	1	2	4	5	4	2	2	6	9	11	12	13	13	13	13	12	12	11	11
30	− 10	− 9	− 9	− 7	− 6	− 4	− 1	+ 2	+ 4	+ 4	+ 4	+ 2	− 2	− 6	− 8	− 10	− 11	− 11	− 11	− 11	− 11	− 11	− 11	− 10	− 10
Sept. 2	8	8	7	6	5	3	1	2	3	4	3	2	1	5	6	8	9	10	10	10	10	9	9	8	8
5	6	6	5	5	4	2	0	1	2	3	2	1	1	4	5	6	7	7	7	7	7	7	7	6	6
8	5	4	4	3	2	2	0	1	2	2	2	1	0	2	3	5	5	5	5	5	5	5	5	5	5
11	2	2	2	2	1	1	0	1	1	1	1	1	0	1	2	2	2	2	2	2	2	2	2	2	2
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ELEPHANT POINT.

Corrections to Times of Low Water (Freshets Period).

Moon's Transit	0h 0m	0h 30m	1h 0m	1h 30m	2h 0m	2h 30m	3h 0m	3h 30m	4h 0m	4h 30m	5h 0m	5h 30m	6h 0m	6h 30m	7h 0m	7h 30m	8h 0m	8h 30m	9h 0m	9h 30m	10h 0m	10h 30m	11h 0m	11h 30m	12h 0m
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	− 1	− 1	− 1	− 1	0	0	0	0	0	0	0	− 1	− 1	− 2	− 2	− 2	− 2	− 2	− 2	− 2	− 2	− 2	− 1	− 1	− 1
22	2	2	2	1	− 1	− 1	− 1	− 1	− 1	− 1	− 1	2	2	3	3	3	3	4	3	3	3	3	2	2	2
25	3	3	2	2	1	1	1	1	2	2	2	2	3	4	4	5	5	6	5	5	4	4	3	3	3
28	4	4	3	2	2	2	2	2	2	2	3	4	4	5	6	7	7	8	7	7	6	5	5	4	4
July 1	− 5	− 5	− 4	− 3	− 2	− 2	− 2	− 2	− 2	− 3	− 4	− 4	− 6	− 7	− 7	− 9	− 9	− 10	− 9	− 8	− 7	− 7	− 6	− 6	− 5
4	6	5	5	4	3	2	2	3	3	4	4	5	7	8	9	10	10	11	10	10	9	8	7	7	6
7	7	6	5	4	3	3	3	3	4	4	5	6	8	10	11	12	12	13	12	12	11	10	9	8	7
10	8	7	6	5	4	3	3	4	4	5	6	7	9	11	12	14	14	15	14	13	12	11	10	9	8
13	9	8	7	5	4	3	3	4	5	6	7	8	10	12	13	15	15	16	15	14	13	12	11	10	9
16	− 10	− 9	− 7	− 6	− 4	− 4	− 4	− 4	− 5	− 6	− 7	− 9	− 11	− 13	− 14	− 17	− 17	− 18	− 17	− 16	− 14	− 13	− 12	− 11	− 10
19	11	9	8	6	5	4	5	5	6	6	8	9	12	14	15	18	18	19	18	17	15	14	12	12	11
22	11	10	8	6	5	4	5	5	6	7	8	10	12	15	17	19	19	20	19	18	17	15	13	12	11
25	12	10	9	7	5	4	5	5	6	7	9	10	14	16	17	20	20	21	20	19	17	16	14	14	12
28	12	11	9	7	5	4	5	6	7	8	9	11	14	17	18	21	21	22	21	20	18	17	15	14	12
31	− 13	− 11	− 9	− 7	− 6	− 5	− 6	− 6	− 7	− 8	− 10	− 11	− 15	− 18	− 19	− 22	− 22	− 23	− 22	− 21	− 19	− 18	− 15	− 15	− 13
Aug. 3	13	11	10	8	6	5	6	6	8	8	10	11	15	18	19	22	22	24	22	21	19	18	16	15	13
6	14	12	10	8	6	5	6	6	8	8	10	12	15	18	20	23	23	24	23	22	20	18	16	15	14
9	14	12	10	8	6	5	6	7	8	8	10	12	15	18	20	23	23	25	23	22	20	18	16	15	14
12	14	12	10	8	6	5	6	7	8	9	11	13	16	19	21	23	24	25	24	23	21	19	17	16	14
15	− 14	− 12	− 10	− 8	− 6	− 5	− 6	− 7	− 8	− 9	− 11	− 13	− 16	− 19	− 21	− 23	− 24	− 25	− 24	− 23	− 21	− 19	− 17	− 16	− 14
18	14	12	10	8	6	5	6	6	8	8	10	13	15	18	20	22	23	25	23	22	20	18	16	15	14
21	13	11	10	8	6	5	6	6	8	8	9	12	15	18	19	21	22	24	22	21	19	18	16	15	13
24	12	11	9	7	5	4	5	6	7	8	8	11	14	17	18	20	21	22	21	20	18	17	15	14	12
27	11	10	8	6	5	4	5	5	6	7	7	10	12	15	17	18	19	20	19	18	17	15	13	12	11
30	− 10	− 9	− 7	− 6	− 4	− 4	− 4	− 4	− 6	− 6	− 7	− 9	− 11	− 13	− 14	− 16	− 17	− 18	− 17	− 16	− 14	− 13	− 12	− 11	− 10
Sept. 2	8	7	6	5	4	3	4	4	5	5	5	8	9	11	12	13	14	15	14	13	12	11	10	9	8
5	6	5	5	4	3	2	3	3	4	4	4	6	7	8	9	10	10	11	10	10	9	8	7	7	6
8	4	4	3	2	2	2	2	2	2	2	3	4	4	5	6	7	7	8	7	7	6	5	5	4	4
11	2	2	2	1	1	1	1	1	1	1	1	2	2	3	3	3	3	4	3	3	3	3	2	2	2
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ELEPHANT POINT.

Corrections to Heights of High Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·16	+ ·18	+ ·19	+ ·19	+ ·20	+ ·21	+ ·21	+ ·21	+ ·22	+ ·22	+ ·22	+ ·22	+ ·22	+ ·21	+ ·20	+ ·19	+ ·16	+ ·13	+ ·12	+ ·11	+ ·12	+ ·13	+ ·14	+ ·15	+ ·16
22	·33	·36	·37	·39	·40	·41	·42	·43	·44	·44	·44	·44	·44	·43	·41	·38	·31	·25	·23	·23	·23	·25	·28	·30	·33
25	·47	·50	·53	·56	·58	·59	·60	·61	·63	·63	·63	·63	·63	·61	·59	·54	·45	·33	·33	·32	·33	·33	·40	·43	·47
28	·63	·69	·72	·75	·78	·80	·82	·83	·84	·85	·83	·83	·84	·83	·79	·73	·60	·49	·45	·44	·45	·49	·53	·58	·63
July 1	+ ·78	+ ·83	+ ·88	+ ·92	+ ·95	+ ·98	+1·00	+1·01	+1·03	+1·05	+1·05	+1·05	+1·03	+1·01	+ ·97	+ ·90	+ ·74	+ ·60	+ ·55	+ ·54	+ ·55	+ ·60	+ ·65	+ ·71	+ ·78
4	·92	1·00	1·04	1·09	1·13	1·16	1·18	1·20	1·22	1·24	1·24	1·24	1·22	1·20	1·15	1·06	·88	·71	·65	·63	·65	·71	·77	·85	·92
7	1·06	1·17	1·21	1·26	1·31	1·34	1·37	1·39	1·41	1·43	1·43	1·43	1·41	1·39	1·35	1·25	1·03	·83	·77	·75	·77	·83	·91	1·00	1·06
10	1·20	1·30	1·37	1·43	1·48	1·52	1·55	1·58	1·60	1·62	1·62	1·62	1·60	1·58	1·50	1·39	1·15	·93	·86	·83	·86	·93	1·01	1·11	1·20
13	1·33	1·43	1·51	1·58	1·63	1·68	1·71	1·74	1·77	1·79	1·79	1·79	1·77	1·74	1·66	1·53	1·27	1·02	·94	·92	·94	1·02	1·12	1·22	1·33
16	+1·45	+1·57	+1·65	+1·73	+1·78	+1·83	+1·87	+1·90	+1·93	+1·95	+1·95	+1·95	+1·93	+1·90	+1·81	+1·68	+1·38	+1·11	+1·03	+1·00	+1·03	+1·11	+1·22	+1·33	+1·45
19	1·55	1·68	1·76	1·85	1·91	1·96	2·00	2·03	2·07	2·09	2·09	2·09	2·07	2·03	1·94	1·79	1·48	1·19	1·10	1·07	1·10	1·19	1·31	1·43	1·55
22	1·65	1·79	1·88	1·97	2·03	2·09	2·13	2·16	2·20	2·23	2·23	2·23	2·20	2·16	2·07	1·91	1·58	1·27	1·17	1·14	1·17	1·27	1·39	1·52	1·65
25	1·73	1·88	1·97	2·07	2·13	2·19	2·24	2·27	2·31	2·34	2·34	2·34	2·31	2·27	2·17	2·01	1·66	1·33	1·23	1·20	1·23	1·33	1·46	1·60	1·73
28	1·82	1·96	2·06	2·16	2·23	2·30	2·34	2·38	2·42	2·45	2·45	2·45	2·42	2·38	2·27	2·10	1·74	1·40	1·29	1·25	1·29	1·40	1·53	1·67	1·82
31	+1·88	+2·02	+2·13	+2·24	+2·31	+2·37	+2·42	+2·46	+2·50	+2·53	+2·53	+2·53	+2·50	+2·46	+2·35	+2·17	+1·79	+1·44	+1·33	+1·30	+1·33	+1·44	+1·58	+1·73	+1·88
Aug. 3	1·94	2·10	2·20	2·31	2·38	2·45	2·50	2·54	2·58	2·61	2·61	2·61	2·58	2·54	2·42	2·24	1·85	1·49	1·38	1·34	1·38	1·49	1·63	1·79	1·94
6	1·98	2·13	2·25	2·36	2·43	2·50	2·55	2·59	2·64	2·67	2·67	2·67	2·64	2·59	2·47	2·29	1·89	1·52	1·41	1·37	1·41	1·52	1·67	1·82	1·98
9	2·02	2·18	2·30	2·41	2·48	2·55	2·60	2·64	2·69	2·72	2·72	2·72	2·69	2·64	2·52	2·34	1·93	1·55	1·44	1·40	1·44	1·55	1·70	1·86	2·02
12	2·04	2·20	2·32	2·43	2·51	2·58	2·63	2·67	2·72	2·75	2·75	2·75	2·72	2·67	2·55	2·36	1·95	1·57	1·45	1·41	1·45	1·57	1·72	1·88	2·04
15	+2·04	+2·20	+2·32	+2·43	+2·51	+2·58	+2·63	+2·67	+2·72	+2·75	+2·75	+2·75	+2·72	+2·67	+2·55	+2·36	+1·95	+1·57	+1·45	+1·41	+1·45	+1·57	+1·72	+1·88	+2·04
18	2·02	2·18	2·30	2·41	2·48	2·55	2·60	2·64	2·69	2·72	2·72	2·72	2·69	2·64	2·52	2·34	1·93	1·55	1·44	1·40	1·44	1·55	1·70	1·86	2·02
21	1·94	2·10	2·20	2·31	2·38	2·45	2·50	2·54	2·58	2·61	2·61	2·61	2·58	2·54	2·42	2·24	1·85	1·49	1·38	1·34	1·38	1·49	1·63	1·79	1·94
24	1·82	1·96	2·06	2·16	2·23	2·30	2·34	2·38	2·42	2·45	2·45	2·45	2·42	2·38	2·27	2·10	1·74	1·40	1·29	1·25	1·29	1·40	1·53	1·67	1·82
27	1·65	1·79	1·88	1·97	2·03	2·09	2·13	2·16	2·20	2·23	2·23	2·23	2·20	2·16	2·07	1·91	1·58	1·27	1·17	1·14	1·17	1·27	1·39	1·52	1·65
30	+1·45	+1·57	+1·65	+1·73	+1·78	+1·83	+1·87	+1·90	+1·93	+1·95	+1·95	+1·95	+1·93	+1·90	+1·81	+1·68	+1·38	+1·11	+1·03	+1·00	+1·03	+1·11	+1·22	+1·33	+1·45
Sept. 2	1·20	1·30	1·37	1·43	1·48	1·52	1·55	1·58	1·60	1·62	1·62	1·62	1·60	1·58	1·50	1·39	1·15	·93	·86	·83	·86	·93	1·01	1·11	1·20
5	·92	1·00	1·04	1·09	1·13	1·16	1·18	1·20	1·22	1·24	1·24	1·24	1·22	1·20	1·15	1·06	·88	·71	·65	·63	·65	·71	·77	·85	·92
8	·63	·69	·72	·75	·78	·80	·82	·83	·84	·85	·85	·85	·84	·83	·79	·73	·60	·49	·45	·44	·45	·49	·53	·58	·63
11	·33	·36	·37	·39	·40	·41	·42	·43	·44	·44	·44	·44	·44	·43	·41	·38	·31	·25	·23	·23	·23	·25	·28	·30	·33
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

ELEPHANT POINT.

Corrections to Heights of Low Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·18	+ ·18	+ ·17	+ ·17	+ ·16	+ ·15	+ ·14	+ ·13	+ ·12	+ ·11	+ ·11	+ ·10	+ ·10	+ ·10	+ ·11	+ ·12	+ ·13	+ ·14	+ ·15	+ ·16	+ ·16	+ ·16	+ ·17	+ ·18	+ ·18
22	·36	·36	·34	·33	·32	·30	·28	·25	·24	·22	·21	·20	·20	·20	·22	·24	·26	·28	·29	·30	·32	·33	·34	·36	·36
25	·50	·50	·48	·48	·46	·43	·40	·36	·34	·32	·30	·29	·29	·30	·32	·34	·37	·40	·42	·43	·46	·47	·49	·50	·50
28	·69	·69	·66	·64	·61	·58	·54	·48	·46	·43	·41	·39	·39	·40	·43	·45	·50	·54	·56	·59	·61	·64	·66	·69	·69
July 1	+ ·83	+ ·83	+ ·81	+ ·79	+ ·75	+ ·71	+ ·66	+ ·60	+ ·56	+ ·53	+ ·50	+ ·48	+ ·48	+ ·50	+ ·53	+ ·58	+ ·62	+ ·66	+ ·69	+ ·72	+ ·75	+ ·78	+ ·81	+ ·83	+ ·83
4	1·00	1·00	·96	·94	·89	·85	·78	·71	·67	·63	·59	·57	·57	·59	·63	·68	·73	·78	·82	·86	·89	·93	·96	1·00	1·00
7	1·17	1·17	1·13	1·10	1·05	1·00	·92	·83	·78	·74	·70	·67	·67	·69	·74	·80	·86	·92	·96	1·00	1·05	1·09	1·13	1·17	1·17
10	1·30	1·30	1·26	1·23	1·17	1·11	1·03	·93	·87	·82	·78	·74	·74	·77	·82	·89	·96	1·02	1·07	1·12	1·17	1·22	1·26	1·30	1·30
13	1·43	1·43	1·39	1·35	1·29	1·22	1·13	1·02	·96	·91	·86	·82	·82	·84	·90	·98	1·05	1·12	1·18	1·23	1·29	1·34	1·39	1·43	1·43
16	+1·57	+1·57	+1·52	+1·48	+1·41	+1·33	+1·24	+1·11	+1·05	+1·00	+ ·94	+ ·89	+ ·89	+ ·92	+ ·99	+1·07	+1·15	+1·23	+1·29	+1·34	+1·41	+1·46	+1·52	+1·57	+1·57
19	1·68	1·68	1·63	1·58	1·50	1·43	1·32	1·19	1·12	1·07	1·00	·96	·96	·99	1·06	1·14	1·23	1·31	1·38	1·44	1·50	1·57	1·63	1·68	1·68
22	1·79	1·79	1·73	1·68	1·60	1·52	1·41	1·27	1·20	1·13	1·07	1·02	1·02	1·06	1·13	1·21	1·31	1·40	1·47	1·53	1·60	1·67	1·73	1·79	1·79
25	1·88	1·88	1·82	1·77	1·68	1·60	1·48	1·33	1·26	1·20	1·12	1·07	1·07	1·10	1·18	1·28	1·38	1·47	1·55	1·61	1·68	1·75	1·82	1·88	1·88
28	1·96	1·96	1·90	1·85	1·76	1·67	1·55	1·40	1·32	1·24	1·17	1·12	1·12	1·16	1·24	1·33	1·44	1·54	1·62	1·70	1·76	1·83	1·90	1·96	1·96
31	+2·02	+2·02	+1·97	+1·91	+1·82	+1·73	+1·60	+1·44	+1·36	+1·29	+1·21	+1·16	+1·16	+1·20	+1·28	+1·40	+1·49	+1·59	+1·67	+1·74	+1·82	+1·90	+1·97	+2·02	+2·02
Aug. 8	2·10	2·10	2·03	1·98	1·88	1·79	1·65	1·49	1·41	1·33	1·25	1·20	1·20	1·23	1·32	1·42	1·54	1·64	1·73	1·80	1·88	1·96	2·03	2·10	2·10
6	2·13	2·13	2·08	2·02	1·92	1·82	1·69	1·52	1·44	1·36	1·28	1·22	1·22	1·27	1·35	1·46	1·57	1·68	1·77	1·84	1·92	2·00	2·08	2·13	2·13
9	2·18	2·18	2·12	2·06	1·96	1·86	1·72	1·55	1·47	1·39	1·31	1·25	1·25	1·28	1·38	1·49	1·60	1·71	1·80	1·89	1·96	2·04	2·12	2·18	2·18
12	2·20	2·20	2·14	2·08	1·98	1·88	1·74	1·57	1·48	1·40	1·32	1·26	1·26	1·30	1·39	1·50	1·62	1·73	1·82	1·90	1·98	2·06	2·14	2·20	2·20
15	+2·20	+2·20	+2·14	+2·08	+1·98	+1·88	+1·74	+1·57	+1·48	+1·40	+1·32	+1·26	+1·26	+1·30	+1·39	+1·50	+1·62	+1·73	+1·82	+1·90	+1·98	+2·06	+2·14	+2·20	+2·20
18	2·18	2·18	2·12	2·06	1·96	1·86	1·72	1·55	1·47	1·39	1·31	1·25	1·25	1·28	1·38	1·49	1·60	1·71	1·80	1·89	1·96	2·04	2·12	2·18	2·18
21	2·10	2·10	2·03	1·98	1·88	1·79	1·65	1·49	1·41	1·33	1·25	1·20	1·20	1·23	1·32	1·42	1·54	1·64	1·73	1·80	1·88	1·96	2·03	2·10	2·10
24	1·96	1·96	1·90	1·85	1·76	1·67	1·55	1·40	1·32	1·24	1·17	1·12	1·12	1·16	1·24	1·33	1·44	1·54	1·62	1·70	1·76	1·83	1·90	1·96	1·96
27	1·79	1·79	1·73	1·68	1·60	1·52	1·41	1·27	1·20	1·13	1·07	1·02	1·02	1·06	1·13	1·21	1·31	1·40	1·47	1·53	1·60	1·67	1·73	1·79	1·79
30	+1·57	+1·57	+1·52	+1·48	+1·41	+1·33	+1·24	+1·11	+1·05	+1·00	+ ·94	+ ·89	+ ·89	+ ·92	+ ·99	+1·07	+1·15	+1·23	+1·29	+1·34	+1·41	+1·46	+1·52	+1·57	+1·57
Sept. 2	1·30	1·30	1·26	1·23	1·17	1·11	1·03	·93	·87	·82	·78	·74	·74	·77	·82	·89	·96	1·02	1·07	1·12	1·17	1·22	1·26	1·30	1·30
5	1·00	1·00	·96	·94	·89	·85	·78	·71	·67	·63	·59	·57	·57	·59	·63	·68	·73	·78	·82	·86	·89	·93	·96	1·00	1·00
8	·69	·69	·66	·64	·61	·58	·54	·48	·46	·43	·41	·39	·39	·40	·43	·45	·50	·54	·56	·59	·61	·64	·66	·69	·69
11	·36	·36	·34	·33	·32	·30	·28	·25	·24	·22	·21	·20	·20	·20	·22	·24	·26	·28	·29	·30	·32	·33	·34	·36	·36
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

RANGOON.

Corrections to Times of High Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	– 1	– 1	– 1	– 1	– 1	– 1	0	0	0	0	0	0	0
22	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	0	0	0	0	0	– 1	1	1	2	2	2	1	– 1	0	0	0	0	0	+ 1
25	1	1	1	1	1	1	0	0	0	0	0	1	2	2	2	3	2	2	1	0	0	0	0	0	1
28	1	1	1	1	1	1	+ 1	+ 1	+ 1	0	– 1	2	2	3	3	3	3	2	2	– 1	0	+ 1	+ 1	+ 1	1
July 1	+ 2	+ 2	+ 2	+ 2	+ 2	+ 2	+ 1	+ 1	+ 1	0	– 1	– 2	– 3	– 3	– 4	– 4	– 4	– 3	– 2	– 1	0	+ 1	+ 1	+ 1	+ 2
4	2	2	2	2	2	2	1	1	1	0	1	2	3	4	5	5	5	4	2	1	0	1	1	1	2
7	2	2	2	2	2	2	1	1	1	0	1	3	4	5	5	6	5	4	3	1	0	1	1	1	2
10	2	2	2	2	2	2	1	1	1	0	1	3	4	5	6	6	6	5	3	1	0	1	1	1	2
13	3	3	3	3	3	3	2	2	1	0	2	3	5	6	7	7	7	5	3	1	0	1	2	2	3
16	+ 3	+ 3	+ 3	+ 3	+ 3	+ 3	+ 2	+ 2	+ 1	0	– 2	– 4	– 5	– 6	– 7	– 8	– 7	– 6	– 4	– 1	0	+ 1	+ 2	+ 2	+ 3
19	3	3	3	3	3	3	2	2	2	0	2	4	5	7	8	8	8	6	4	2	0	2	2	2	3
22	3	3	3	3	3	3	2	2	2	0	2	4	6	7	8	9	8	6	4	2	0	2	2	2	3
25	3	3	3	3	3	3	2	2	2	0	2	4	6	8	9	9	9	7	4	2	0	2	2	2	3
28	4	4	4	4	4	4	3	3	2	0	3	4	6	8	9	10	9	7	4	2	0	2	3	3	4
31	+ 4	+ 4	+ 4	+ 4	+ 4	+ 4	+ 3	+ 3	+ 2	0	– 3	– 5	– 6	– 8	– 9	– 10	– 9	– 7	– 5	– 2	0	+ 2	+ 3	+ 3	+ 4
Aug. 3	4	4	4	4	4	4	3	3	2	0	3	5	7	9	10	10	10	8	5	2	0	2	3	3	4
6	4	4	4	4	4	4	3	3	2	0	3	5	7	9	10	11	10	8	5	2	0	2	3	3	4
9	4	4	4	4	4	4	3	3	2	0	3	5	7	9	10	11	10	8	5	2	0	2	3	3	4
12	4	4	4	4	4	4	3	3	2	0	3	5	7	9	10	11	10	8	5	2	0	2	3	3	4
15	+ 4	+ 4	+ 4	+ 4	+ 4	+ 4	+ 3	+ 3	+ 2	0	– 3	+ 5	– 7	– 9	– 10	– 11	– 10	– 8	– 5	– 2	0	+ 2	+ 3	+ 3	+ 4
18	4	4	4	4	4	4	3	3	2	0	3	5	7	9	10	11	10	8	5	2	0	2	3	3	4
21	4	4	4	4	4	4	3	3	2	0	3	5	7	9	10	10	10	8	5	2	0	2	3	3	4
24	4	4	4	4	4	4	3	3	2	0	3	4	6	8	9	10	9	7	4	2	0	2	3	3	4
27	3	3	3	3	3	3	2	2	2	0	2	4	6	7	8	9	8	6	4	2	0	2	2	2	3
30	+ 3	+ 3	+ 3	+ 3	+ 3	+ 3	+ 2	+ 2	+ 1	0	– 2	– 4	– 5	– 6	– 7	– 8	– 7	– 6	– 4	– 1	0	+ 1	+ 2	+ 2	+ 3
Sept. 2	2	2	2	2	2	2	1	1	1	0	1	3	4	5	6	6	6	5	3	1	0	1	1	1	2
5	2	2	2	2	2	2	1	1	1	0	1	2	3	4	5	5	5	4	2	1	0	1	1	1	2
8	1	1	1	1	1	1	1	1	1	0	1	2	2	3	3	3	3	2	2	1	0	1	1	1	1
11	1	1	1	1	1	1	0	0	0	0	0	1	1	1	2	2	2	1	1	0	0	0	0	0	1
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

RANGOON.

Corrections to Times of Low Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	+ 1	+ 1	+ 1	+ 2	+ 2	+ 1	+ 1	+ 1	+ 1	0	0	0	0	0	0	− 1	− 1	− 1	0	0
22	− 1	0	0	0	+ 1	1	2	3	3	3	3	2	2	1	+ 1	0	0	0	− 1	− 1	1	1	1	− 1	− 1
25	1	− 1	0	0	1	2	3	4	4	4	4	3	3	2	1	0	0	0	1	1	2	2	2	1	1
28	2	1	0	+ 1	2	3	4	5	6	6	5	4	3	3	2	+ 1	0	− 1	2	2	2	2	2	2	2
July 1	− 2	− 1	0	+ 1	+ 2	+ 3	+ 5	+ 6	+ 7	+ 7	+ 6	+ 5	+ 4	+ 3	+ 2	+ 1	0	− 1	− 2	− 2	− 3	− 3	− 3	− 2	− 2
4	2	1	0	1	3	4	6	8	9	9	8	6	5	4	3	1	0	1	2	3	3	4	3	3	2
7	3	2	0	1	3	5	7	9	10	10	9	7	6	5	3	1	0	1	3	3	4	4	4	3	3
10	3	2	0	1	4	5	8	10	11	11	10	8	6	5	4	1	0	1	3	4	4	5	4	4	3
13	3	2	0	2	4	6	8	11	12	12	11	9	7	6	4	2	0	2	3	4	5	5	5	4	3
16	− 4	− 2	0	+ 2	+ 4	+ 6	+ 9	+ 12	+ 13	+ 13	+ 12	+ 10	+ 8	+ 6	+ 4	+ 2	0	− 2	− 4	− 4	− 5	− 6	− 5	− 4	− 4
19	4	2	0	2	5	7	10	13	14	14	13	11	8	7	5	2	0	2	4	5	6	6	6	5	4
22	4	2	0	2	5	7	11	14	15	15	14	11	9	7	5	2	0	2	4	5	6	6	6	5	4
25	4	3	0	2	5	8	11	14	16	16	14	12	9	8	5	2	0	2	4	5	6	7	6	5	4
28	4	3	0	3	5	8	12	15	17	17	15	12	10	8	5	3	0	3	4	5	6	7	6	5	4
31	− 5	− 3	0	+ 3	+ 6	+ 8	+ 12	+ 16	+ 17	+ 17	+ 16	+ 13	+ 10	+ 8	+ 6	+ 3	0	− 3	− 5	− 6	− 6	− 7	− 6	− 6	− 5
Aug. 3	5	3	0	3	6	9	12	16	18	18	16	13	10	9	6	3	0	3	5	6	7	8	7	6	5
6	5	3	0	3	6	9	13	16	18	18	16	14	11	9	6	3	0	3	5	6	7	8	7	6	5
9	5	3	0	3	6	9	13	17	19	19	17	14	11	9	6	3	0	3	5	6	7	8	7	6	5
12	5	3	0	3	6	9	13	17	19	19	17	14	11	9	6	3	0	3	5	6	7	8	7	6	5
15	− 5	− 3	0	+ 3	+ 6	+ 9	+ 13	+ 17	+ 19	+ 19	+ 17	+ 14	+ 11	+ 9	+ 6	+ 3	0	− 3	− 5	− 6	− 7	− 8	− 7	− 6	− 5
18	5	3	0	3	6	9	13	17	19	19	17	14	11	9	6	3	0	3	5	6	7	8	7	6	5
21	5	3	0	3	6	9	12	16	18	18	16	13	10	9	6	3	0	3	5	6	7	8	7	6	5
24	4	3	0	3	5	8	12	15	17	17	15	12	10	9	5	3	0	3	4	5	6	7	6	5	4
27	4	2	0	2	5	7	11	14	15	15	14	11	9	7	5	2	0	2	4	5	6	6	6	5	4
30	− 4	− 2	0	+ 2	+ 4	+ 6	+ 9	+ 12	+ 13	+ 13	+ 12	+ 10	+ 8	+ 6	+ 4	+ 2	0	− 2	− 4	− 4	− 5	− 6	− 5	− 4	− 4
Sept. 2	3	2	0	1	4	5	8	10	11	11	10	8	6	5	4	1	0	1	3	4	4	5	4	4	3
5	2	1	0	1	3	4	6	8	9	9	8	6	5	4	3	1	0	1	2	3	3	4	3	3	2
8	2	1	0	1	2	3	4	5	6	6	5	4	3	3	2	1	0	1	2	2	2	2	2	2	2
11	1	0	0	0	1	1	2	3	3	3	3	2	2	1	1	0	0	0	1	1	1	1	1	1	1
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

RANGOON.

Corrections to Heights of High Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·17	+ ·18	+ ·18	+ ·19	+ ·21	+ ·20	+ ·21	+ ·22	+ ·22	+ ·22	+ ·21	+ ·20	+ ·20	+ ·19	+ ·18	+ ·16	+ ·16	+ ·15	+ ·15	+ ·15	+ ·16	+ ·16	+ ·17	+ ·17	+ ·17
22	·34	·35	·38	·39	·40	·41	·42	·42	·42	·42	·42	·41	·40	·38	·35	·32	·30	·31	·31	·31	·31	·32	·33	·33	·34
25	·49	·52	·54	·56	·58	·60	·60	·61	·61	·61	·61	·60	·58	·55	·51	·46	·45	·43	·43	·43	·43	·46	·46	·48	·49
28	·66	·68	·72	·75	·78	·81	·81	·83	·83	·83	·83	·80	·78	·74	·68	·63	·59	·59	·59	·59	·59	·61	·62	·64	·66
July 1	+ ·81	+ ·85	+ ·88	+ ·92	+ ·96	+ ·98	+1·00	+1·02	+1·02	+1·02	+1·00	+ ·98	+ ·95	+ ·90	+ ·84	+ ·77	+ ·73	+ ·71	+ ·71	+ ·71	+ ·73	+ ·75	+ ·77	+ ·79	+ ·81
4	·96	·99	1·05	1·10	1·13	1·17	1·18	1·21	1·21	1·21	1·20	1·17	1·13	1·06	·99	·91	·86	·84	·84	·84	·86	·88	·91	·92	·96
7	1·13	1·15	1·24	1·27	1·34	1·35	1·38	1·41	1·41	1·41	1·41	1·35	1·33	1·26	1·17	1·08	1·02	·99	·99	·99	1·01	1·04	1·06	1·10	1·13
10	1·26	1·31	1·38	1·44	1·49	1·52	1·56	1·57	1·57	1·57	1·57	1·52	1·48	1·39	1·30	1·21	1·14	1·10	1·10	1·10	1·13	1·15	1·19	1·21	1·26
13	1·39	1·44	1·52	1·58	1·63	1·69	1·71	1·74	1·74	1·74	1·73	1·69	1·63	1·53	1·43	1·32	1·24	1·22	1·22	1·22	1·25	1·27	1·31	1·33	1·39
16	+1·52	+1·57	+1·65	+1·72	+1·78	+1·84	+1·87	+1·90	+1·90	+1·90	+1·89	+1·84	+1·78	+1·68	+1·56	+1·44	+1·36	+1·34	+1·34	+1·34	+1·35	+1·40	+1·42	+1·47	+1·52
19	1·63	1·68	1·78	1·85	1·91	1·96	2·00	2·02	2·02	2·02	2·01	1·96	1·90	1·80	1·67	1·55	1·45	1·43	1·43	1·43	1·46	1·49	1·53	1·57	1·63
22	1·73	1·79	1·88	1·96	2·04	2·10	2·13	2·17	2·17	2·17	2·15	2·10	2·03	1·92	1·78	1·65	1·55	1·53	1·53	1·53	1·54	1·59	1·62	1·67	1·73
25	1·82	1·88	1·99	2·07	2·14	2·21	2·24	2·27	2·27	2·27	2·26	2·21	2·13	2·00	1·87	1·73	1·63	1·59	1·59	1·59	1·63	1·66	1·71	1·75	1·82
28	1·90	1·99	2·08	2·17	2·25	2·30	2·35	2·37	2·37	2·37	2·36	2·30	2·23	2·10	1·96	1·82	1·71	1·67	1·67	1·67	1·70	1·74	1·79	1·83	1·90
31	+1·97	+2·04	+2·15	+2·24	+2·31	+2·39	+2·43	+2·45	+2·45	+2·45	+2·43	+2·39	+2·30	+2·17	+2·02	+1·88	+1·76	+1·73	+1·73	+1·73	+1·75	+1·80	+1·84	+1·89	+1·97
Aug. 3	2·03	2·10	2·22	2·31	2·39	2·47	2·50	2·54	2·54	2·54	2·52	2·47	2·38	2·24	2·09	1·93	1·82	1·78	1·78	1·78	1·82	1·86	1·91	1·95	2·03
6	2·08	2·15	2·26	2·35	2·44	2·51	2·57	2·59	2·59	2·59	2·58	2·51	2·43	2·28	2·13	1·98	1·86	1·83	1·83	1·83	1·86	1·90	1·95	1·99	2·08
9	2·12	2·20	2·31	2·41	2·50	2·56	2·62	2·64	2·64	2·64	2·63	2·56	2·48	2·33	2·18	2·02	1·91	1·86	1·86	1·86	1·90	1·94	1·99	2·03	2·12
12	2·14	2·22	2·33	2·43	2·52	2·59	2·64	2·67	2·67	2·67	2·65	2·59	2·50	2·36	2·20	2·04	1·92	1·88	1·88	1·88	1·91	1·96	2·01	2·06	2·14
15	+2·14	+2·22	+2·33	+2·43	+2·52	+2·59	+2·64	+2·67	+2·67	+2·67	+2·65	+2·59	+2·50	+2·36	+2·20	+2·04	+1·92	+1·88	+1·88	+1·88	+1·91	+1·96	+2·01	+2·06	+2·14
18	2·12	2·20	2·31	2·41	2·50	2·56	2·62	2·64	2·64	2·64	2·63	2·56	2·48	2·33	2·18	2·02	1·91	1·86	1·86	1·86	1·90	1·94	1·99	2·03	2·12
21	2·03	2·10	2·22	2·31	2·39	2·47	2·50	2·54	2·54	2·54	2·52	2·47	2·38	2·24	2·09	1·93	1·82	1·78	1·78	1·78	1·82	1·86	1·91	1·95	2·03
24	1·90	1·99	2·08	2·17	2·25	2·30	2·35	2·37	2·37	2·37	2·36	2·30	2·23	2·10	1·96	1·82	1·71	1·67	1·67	1·67	1·70	1·74	1·79	1·83	1·90
27	1·73	1·79	1·88	1·96	2·04	2·10	2·13	2·17	2·17	2·17	2·15	2·10	2·03	1·92	1·78	1·65	1·55	1·53	1·53	1·53	1·54	1·59	1·62	1·67	1·73
30	+1·52	+1·57	+1·65	+1·72	+1·78	+1·84	+1·87	+1·90	+1·90	+1·90	+1·89	+1·84	+1·78	+1·68	+1·56	+1·44	+1·36	+1·34	+1·34	+1·34	+1·35	+1·40	+1·42	+1·47	+1·52
Sept. 2	1·26	1·31	1·38	1·44	1·49	1·52	1·56	1·57	1·57	1·57	1·57	1·52	1·48	1·39	1·30	1·21	1·14	1·10	1·10	1·10	1·13	1·15	1·19	1·21	1·26
5	·96	·99	1·05	1·10	1·13	1·17	1·18	1·21	1·21	1·21	1·20	1·17	1·13	1·06	·99	·91	·86	·84	·84	·84	·86	·88	·91	·92	·96
8	·66	·68	·72	·75	·78	·81	·81	·83	·83	·83	·83	·81	·78	·74	·68	·63	·59	·59	·59	·59	·59	·61	·62	·64	·66
11	·34	·35	·38	·39	·40	·41	·42	·42	·42	·42	·42	·41	·40	·38	·35	·32	·30	·31	·31	·31	·31	·32	·33	·33	·34
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

RANGOON.

Corrections to Heights of Low Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·30	+ ·30	+ ·30	+ ·29	+ ·28	+ ·27	+ ·27	+ ·25	+ ·23	+ ·22	+ ·22	+ ·21	+ ·20	+ ·19	+ ·19	+ ·22	+ ·22	+ ·23	+ ·25	+ ·25	+ ·26	+ ·27	+ ·28	+ ·29	+ ·30
22	·59	·59	·59	·58	·56	·55	·53	·50	·48	·46	·42	·41	·39	·38	·40	·42	·46	·48	·50	·52	·53	·55	·57	·58	·59
25	·85	·85	·85	·83	·81	·75	·76	·72	·68	·66	·61	·57	·55	·55	·57	·61	·66	·68	·71	·75	·76	·75	·82	·83	·85
28	1·14	1·15	1·14	1·11	1·09	1·07	1·02	·97	·93	·87	·83	·77	·74	·74	·77	·83	·87	·93	·96	1·00	1·03	1·07	1·09	1·11	1·14
July 1	+1·40	+1·41	+1·40	+1·38	+1·34	+1·31	+1·26	+1·19	+1·13	+1·07	+1·02	+ ·96	+ ·92	+ ·90	+ ·94	+1·02	+1·07	+1·13	+1·19	+1·22	+1·26	+1·31	+1·34	+1·38	+1·40
4	1·64	1·67	1·64	1·63	1·59	1·56	1·49	1·41	1·34	1·28	1·21	1·13	1·09	1·06	1·11	1·21	1·28	1·34	1·40	1·46	1·50	1·56	1·59	1·63	1·64
7	1·94	1·96	1·94	1·93	1·87	1·83	1·75	1·66	1·57	1·50	1·41	1·33	1·27	1·26	1·31	1·41	1·50	1·57	1·64	1·72	1·77	1·83	1·88	1·93	1·94
10	2·15	2·18	2·15	2·13	2·09	2·04	1·96	1·86	1·75	1·67	1·57	1·49	1·43	1·39	1·46	1·57	1·67	1·75	1·84	1·91	1·98	2·04	2·09	2·13	2·15
13	2·37	2·41	2·37	2·35	2·30	2·25	2·16	2·04	1·93	1·84	1·74	1·64	1·57	1·53	1·61	1·72	1·84	1·93	2·03	2·10	2·17	2·25	2·30	2·35	2·37
16	+2·60	+2·63	+2·60	+2·56	+2·51	+2·45	+2·35	+2·22	+2·12	+2·00	+1·90	+1·78	+1·71	+1·68	+1·77	+1·90	+2·00	+2·12	+2·20	+2·29	+2·37	+2·45	+2·50	+2·56	+2·60
19	2·79	2·81	2·79	2·75	2·69	2·62	2·52	2·38	2·27	2·16	2·02	1·91	1·84	1·80	1·89	2·02	2·16	2·27	2·37	2·46	2·53	2·62	2·69	2·75	2·79
22	2·97	3·00	2·97	2·92	2·86	2·80	2·68	2·54	2·42	2·29	2·19	2·03	1·95	1·92	2·01	2·17	2·29	2·42	2·51	2·61	2·70	2·80	2·85	2·92	2·97
25	3·11	3·15	3·25	3·07	3·00	2·94	2·82	2·66	2·53	2·41	2·27	2·14	2·05	2·00	2·10	2·26	2·41	2·53	2·65	2·75	2·83	2·94	3·01	3·07	3·11
28	3·25	3·29	3·32	3·22	3·16	3·08	2·95	2·80	2·65	2·52	2·37	2·24	2·15	2·10	2·20	2·37	2·52	2·65	2·77	2·88	2·98	3·08	3·15	3·22	3·25
31	+3·36	+3·40	+3·36	+3·32	+3·26	+3·17	+3·04	+2·89	+2·75	+2·61	+2·45	+2·30	+2·21	+2·17	+2·29	+2·45	+2·61	+2·75	+2·86	+2·98	+3·08	+3·17	+3·25	+3·32	+3·36
Aug. 3	3·47	3·52	3·47	3·42	3·37	3·28	3·15	2·98	2·83	2·69	2·54	2·39	2·29	2·25	2·35	2·54	2·69	2·83	2·96	3·07	3·17	3·28	3·36	3·42	3·47
6	3·55	3·59	3·55	3·51	3·44	3·35	3·22	3·05	2·90	2·74	2·59	2·44	2·34	2·28	2·41	2·59	2·74	2·90	3·02	3·13	3·24	3·35	3·42	3·51	3·55
9	3·62	3·66	3·62	3·58	3·51	3·42	3·28	3·11	2·95	2·81	2·64	2·49	2·39	2·33	2·45	2·64	2·81	2·95	3·08	3·20	3·31	3·42	3·50	3·58	3·62
12	3·66	3·70	3·66	3·61	3·54	3·45	3·31	3·14	2·98	2·83	2·67	2·51	2·41	2·36	2·48	2·67	2·83	2·98	3·11	3·23	3·34	3·45	3·53	3·61	3·66
15	+3·66	+3·70	+3·66	+3·61	+3·54	+3·45	+3·31	+3·14	+2·98	+2·83	+2·67	+2·51	+2·41	+2·36	+2·48	+2·67	+2·83	+2·98	+3·11	+3·23	+3·34	+3·45	+3·53	+3·61	+3·66
18	3·62	3·66	3·62	3·58	3·51	3·42	3·28	3·11	2·95	2·81	2·64	2·49	2·39	2·33	2·45	2·64	2·81	2·95	3·08	3·20	3·31	3·42	3·50	3·58	3·62
21	3·47	3·52	3·47	3·42	3·37	3·28	3·15	2·98	2·83	2·69	2·54	2·39	2·29	2·25	2·35	2·54	2·69	2·83	2·96	3·07	3·17	3·28	3·36	3·42	3·47
24	3·25	3·29	3·32	3·22	3·16	3·08	2·95	2·80	2·65	2·52	2·37	2·24	2·15	2·10	2·20	2·37	2·52	2·65	2·77	2·88	2·98	3·08	3·15	3·22	3·25
27	2·97	3·00	2·97	2·92	2·86	2·80	2·68	2·54	2·42	2·29	2·17	2·03	1·95	1·92	2·01	2·17	2·29	2·42	2·51	2·61	2·70	2·80	2·85	2·92	2·97
30	+2·60	+2·63	+2·60	+2·56	+2·51	+2·45	+2·35	+2·22	+2·12	+2·00	+1·90	+1·78	+1·71	+1·68	+1·77	+1·90	+2·00	+2·12	+2·20	+2·29	+2·39	+2·45	+2·50	+2·56	+2·60
Sept. 2	2·15	2·18	2·15	2·13	2·09	2·04	1·96	1·86	1·75	1·67	1·57	1·49	1·43	1·39	1·46	1·57	1·67	1·75	1·84	1·91	1·98	2·04	2·09	2·13	2·15
5	1·64	1·67	1·64	1·63	1·59	1·56	1·49	1·41	1·34	1·28	1·21	1·13	1·09	1·06	1·11	1·21	1·28	1·34	1·40	1·46	1·50	1·56	1·59	1·62	1·64
8	1·14	1·15	1·14	1·11	1·09	1·07	1·02	·97	·93	·87	·83	·77	·74	·74	·77	·83	·87	·93	·96	1·00	1·03	1·07	1·09	1·11	1·14
11	·59	·59	·59	·58	·56	·55	·53	·50	·48	·46	·42	·41	·39	·38	·40	·42	·46	·48	·50	·52	·53	·55	·57	·58	·59
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

AMHERST.

Corrections to Times of High Water (Freshets Period).

Moon's Transit	0h 0m	0h 30m	1h 0m	1h 30m	2h 0m	2h 30m	3h 0m	3h 30m	4h 0m	4h 30m	5h 0m	5h 30m	6h 0m	6h 30m	7h 0m	7h 30m	8h 0m	8h 30m	9h 0m	9h 30m	10h 0m	10h 30m	11h 0m	11h 30m	12h 0m
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	−1	−1	−1	−1	−1	−1	−1	−1	−1	0	0	0	0	0	0	0	0	+1	+1	0	0	0	0	0	−1
25	1	1	1	1	1	1	1	1	1	−1	0	0	0	0	0	+1	+1	1	1	+1	0	0	0	0	1
28	1	2	2	2	2	2	2	2	1	1	−1	0	0	0	+1	1	1	1	1	1	+1	0	0	−1	1
July 1	−2	−2	−2	−2	−2	−2	−2	−2	−2	−1	−1	0	0	0	+1	+1	+1	+2	+2	+1	+1	0	0	−1	−2
4	2	2	2	3	3	3	3	2	2	1	1	0	0	0	1	1	1	2	2	1	1	0	0	1	2
7	2	3	3	3	3	3	3	3	2	2	1	−1	0	+1	1	2	2	2	2	2	1	+1	0	1	2
10	2	3	3	4	4	4	4	3	2	2	1	1	0	1	1	2	2	2	2	2	1	1	0	1	2
13	3	3	3	4	4	4	4	3	3	2	1	1	0	1	1	2	2	3	3	2	1	1	0	1	3
16	−3	−4	−4	−4	−4	−4	−4	−4	−3	−2	−1	−1	0	+1	+1	+2	+2	+3	+3	+2	+1	+1	0	−1	−3
19	3	4	4	5	5	5	5	4	3	2	2	1	0	1	2	2	2	3	3	2	2	1	0	2	3
22	3	4	4	5	5	5	5	4	3	2	2	1	0	1	2	2	2	3	3	2	2	1	0	2	3
25	3	4	4	5	5	5	5	4	3	3	2	1	0	1	2	3	3	3	3	3	2	1	0	2	3
28	4	4	4	5	5	5	5	4	4	3	2	1	0	1	2	3	3	4	4	3	2	1	0	2	4
31	−4	−5	−5	−6	−6	−6	−6	−5	−4	−3	−2	−1	0	+1	+2	+3	+3	+4	+4	+3	+2	+1	0	−2	−4
Aug. 3	4	5	5	6	6	6	6	5	4	3	2	1	0	1	2	3	3	4	4	3	2	1	0	2	4
6	4	5	5	6	6	6	6	5	4	3	2	1	0	1	2	3	3	4	4	3	2	1	0	2	4
9	4	5	5	6	6	6	6	5	4	3	2	1	0	1	2	3	3	4	4	3	2	1	0	2	4
12	4	5	5	6	6	6	6	5	4	3	2	1	0	1	2	3	3	4	4	3	2	1	0	2	4
15	−4	−5	−5	−6	−6	−6	−6	−5	−4	−3	−2	−1	0	+1	+2	+3	+3	+4	+4	+3	+2	+1	0	−2	−4
18	4	5	5	6	6	6	6	5	4	3	2	1	0	1	2	3	3	4	4	3	2	1	0	2	4
21	4	5	5	6	6	6	6	5	4	3	2	1	0	1	2	3	3	4	4	3	2	1	0	2	4
24	4	4	4	5	5	5	5	4	4	3	2	1	0	1	2	3	3	4	4	3	2	1	0	2	4
27	3	4	4	5	5	5	5	4	3	2	2	1	0	1	2	2	2	3	3	2	2	1	0	2	3
30	−3	−4	−4	−4	−4	−4	−4	−4	−3	−2	−1	−1	0	+1	+1	+2	+2	+3	+3	+2	+1	+1	0	−1	−3
Sept. 2	2	3	3	4	4	4	4	3	2	2	1	1	0	1	1	2	2	2	2	2	1	1	0	1	2
5	2	2	2	3	3	3	3	2	2	1	1	0	0	0	1	1	1	2	2	1	1	0	0	1	2
8	1	2	2	2	2	2	2	2	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	1	1
11	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AMHERST.

Corrections to Times of Low Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	0
22	+1	+1	+1	0	0	0	0	0	+1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	+1
25	1	1	1	+1	+1	+1	+1	+1	1	2	2	3	3	3	3	3	3	2	2	2	2	2	2	2	1
28	1	1	1	1	1	1	1	1	2	2	3	3	4	4	4	4	4	3	3	2	2	2	2	2	2
July 1	+2	+2	+2	+2	+2	+1	+1	+2	+2	+3	+4	+4	+5	+5	+5	+5	+5	+4	+3	+3	+3	+3	+3	+3	+2
4	2	2	2	2	2	2	2	2	3	4	5	5	5	6	6	6	5	5	4	3	3	3	3	3	3
7	3	3	3	3	3	2	2	3	3	4	5	6	6	7	7	7	6	5	5	4	4	4	4	4	3
10	3	3	3	3	3	2	2	3	4	5	6	7	7	8	8	8	7	6	5	4	4	4	4	4	4
13	4	4	4	3	3	2	2	3	4	5	7	7	8	8	8	9	8	7	6	5	5	5	5	5	4
16	+4	+4	+4	+3	+3	+3	+3	+3	+5	+6	+7	+8	+9	+9	+9	+10	+9	+7	+6	+5	+5	+5	+5	+5	+4
19	4	4	4	4	4	3	3	4	5	6	8	8	9	10	10	11	9	8	7	6	6	5	5	5	5
22	5	5	5	4	4	3	3	4	5	6	8	9	10	11	11	12	10	8	7	6	6	6	6	6	5
25	5	5	5	4	4	3	3	4	6	7	9	9	10	11	11	12	10	9	8	6	6	6	6	6	5
28	5	5	5	4	4	3	3	4	6	7	9	10	11	12	12	13	11	9	8	7	7	6	6	6	5
31	+5	+5	+5	+5	+5	+4	+4	+5	+6	+7	+9	+10	+11	+12	+12	+13	+11	+9	+8	+7	+7	+6	+6	+6	+6
Aug. 3	6	6	6	5	5	4	4	5	7	8	10	10	11	12	12	13	11	10	9	7	7	7	7	7	6
6	6	6	6	5	5	4	4	5	7	8	10	11	12	13	13	14	12	10	9	8	8	7	7	7	6
9	6	6	6	5	5	4	4	5	7	8	10	11	12	13	13	14	12	10	9	8	8	7	7	7	6
12	6	6	6	5	5	4	4	5	7	8	10	11	12	13	13	14	12	10	9	8	8	7	7	7	6
15	+6	+6	+6	+5	+5	+4	+4	+5	+7	+8	+10	+11	+12	+13	+13	+14	+12	+10	+9	+8	+8	+7	+7	+7	+6
18	6	6	6	5	5	4	4	5	7	8	10	11	12	13	13	14	12	10	9	8	8	7	7	7	6
21	6	6	6	5	5	4	4	5	7	8	10	10	11	12	12	13	11	10	9	8	8	7	7	7	6
24	5	5	5	4	4	4	4	4	6	7	9	10	11	12	12	12	11	9	8	7	7	6	6	6	5
27	5	5	5	4	4	3	3	4	6	6	8	9	10	11	11	11	10	8	7	6	6	6	6	6	5
30	+4	+4	+4	+4	+4	+3	+3	+4	+5	+6	+7	+8	+9	+9	+9	+10	+9	+7	+6	+6	+6	+5	+5	+5	+4
Sept. 2	3	3	3	3	3	2	2	3	4	5	6	7	7	8	8	8	7	6	5	5	5	4	4	4	4
5	3	3	3	2	2	2	2	2	3	4	5	5	5	6	6	6	5	5	4	4	4	3	3	3	3
8	2	2	2	2	2	1	1	2	2	2	3	4	4	4	4	4	4	3	3	2	2	2	2	2	2
11	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AMHERST.

Corrections to Heights of High Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet	feet
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·09	+ ·10	+ ·11	+ ·12	+ ·12	+ ·13	+ ·13	+ ·14	+ ·14	+ ·15	+ ·15	+ ·14	+ ·14	+ ·13	+ ·12	+ ·10	+ ·09	+ ·08	+ ·07	+ ·06	+ ·06	+ ·06	+ ·07	+ ·08	+ ·09
22	·17	·20	·22	·23	·24	·26	·27	·28	·29	·29	·29	·28	·28	·26	·24	·21	·18	·16	·14	·13	·12	·12	·13	·15	·17
25	·25	·29	·32	·33	·35	·37	·38	·40	·41	·42	·42	·41	·40	·37	·34	·30	·26	·23	·20	·18	·18	·18	·19	·22	·25
28	·33	·40	·42	·45	·47	·50	·52	·54	·56	·57	·56	·55	·53	·51	·46	·40	·35	·31	·28	·25	·24	·24	·26	·29	·33
July 1	+ ·41	+ ·49	+ ·52	+ ·55	+ ·58	+ ·61	+ ·63	+ ·66	+ ·68	+ ·70	+ ·69	+ ·68	+ ·65	+ ·62	+ ·56	+ ·49	+ ·43	+ ·38	+ ·34	+ ·30	+ ·30	+ ·29	+ ·32	+ ·36	+ ·41
4	·49	·58	·62	·65	·69	·72	·75	·78	·81	·83	·82	·80	·77	·73	·66	·58	·51	·45	·40	·36	·35	·35	·37	·42	·49
7	·57	·68	·73	·77	·81	·85	·89	·92	·95	·98	·96	·94	·91	·86	·78	·69	·60	·52	·47	·42	·41	·41	·44	·50	·57
10	·64	·76	·81	·86	·90	·94	·99	1·02	1·06	1·09	1·07	1·05	1·01	·96	·87	·77	·67	·58	·53	·47	·46	·45	·49	·55	·64
13	·71	·83	·89	·94	·99	1·04	1·09	1·12	1·17	1·20	1·18	1·16	1·12	1·06	·96	·84	·74	·64	·58	·52	·51	·50	·54	·61	·71
16	+ ·78	+ ·91	+ ·97	+ 1·03	+ 1·09	+ 1·14	+ 1·19	+ 1·23	+ 1·28	+ 1·31	+ 1·29	+ 1·26	+ 1·22	+ 1·16	+ 1·04	+ ·92	+ ·81	+ ·70	+ ·63	+ ·57	+ ·55	+ ·55	+ ·59	+ ·67	+ ·78
19	·83	·97	1·04	1·10	1·16	1·22	1·27	1·31	1·37	1·40	1·38	1·35	1·31	1·24	1·12	·99	·86	·75	·68	·61	·59	·59	·63	·71	·83
22	·88	1·04	1·11	1·17	1·24	1·30	1·35	1·40	1·46	1·49	1·47	1·44	1·39	1·32	1·19	1·05	·92	·80	·72	·65	·63	·62	·67	·76	·88
25	·93	1·09	1·16	1·23	1·30	1·36	1·42	1·47	1·53	1·56	1·55	1·51	1·46	1·39	1·25	1·11	·97	·84	·76	·68	·66	·65	·71	·80	·93
28	·98	1·15	1·23	1·30	1·38	1·44	1·50	1·55	1·62	1·65	1·63	1·60	1·55	1·47	1·32	1·17	1·02	·89	·80	·72	·70	·69	·75	·85	·98
31	+ 1·00	+ 1·19	+ 1·26	+ 1·33	+ 1·41	+ 1·47	+ 1·54	+ 1·59	+ 1·66	+ 1·69	+ 1·67	+ 1·64	+ 1·58	+ 1·50	+ 1·35	+ 1·20	+ 1·05	+ ·91	+ ·82	+ ·74	+ ·72	+ ·71	+ ·77	+ ·86	+ 1·00
Aug. 3	1·04	1·22	1·30	1·38	1·45	1·52	1·59	1·64	1·71	1·75	1·73	1·69	1·64	1·55	1·40	1·24	1·08	·94	·84	·76	·74	·73	·79	·89	1·04
6	1·06	1·24	1·33	1·41	1·48	1·55	1·62	1·68	1·75	1·78	1·77	1·73	1·67	1·58	1·43	1·26	1·11	·96	·86	·78	·76	·75	·81	·91	1·06
9	1·08	1·27	1·36	1·44	1·51	1·58	1·65	1·71	1·78	1·82	1·80	1·76	1·70	1·61	1·46	1·29	1·13	·98	·88	·79	·77	·76	·82	·93	1·08
12	1·09	1·28	1·37	1·45	1·53	1·60	1·67	1·73	1·80	1·84	1·82	1·78	1·72	1·63	1·47	1·30	1·14	·99	·89	·80	·78	·77	·83	·94	1·09
15	+ 1·09	+ 1·28	+ 1·37	+ 1·45	+ 1·53	+ 1·60	+ 1·67	+ 1·73	+ 1·80	+ 1·84	+ 1·82	+ 1·78	+ 1·72	+ 1·63	+ 1·47	+ 1·30	+ 1·14	+ ·99	+ ·89	+ ·80	+ ·78	+ ·77	+ ·83	+ ·94	+ 1·09
18	1·08	1·27	1·36	1·44	1·51	1·58	1·65	1·71	1·78	1·82	1·80	1·76	1·70	1·61	1·46	1·29	1·13	·98	·88	·79	·77	·76	·82	·93	1·08
21	1·04	1·22	1·30	1·38	1·45	1·52	1·59	1·64	1·71	1·75	1·73	1·69	1·64	1·55	1·40	1·24	1·08	·94	·84	·76	·74	·73	·79	·89	1·04
24	·98	1·15	1·23	1·30	1·38	1·44	1·50	1·55	1·62	1·65	1·63	1·60	1·55	1·47	1·32	1·17	1·02	·88	·80	·72	·70	·69	·75	·85	·98
27	·88	1·04	1·11	1·17	1·24	1·30	1·35	1·40	1·46	1·49	1·47	1·44	1·39	1·32	1·19	1·05	·92	·80	·72	·65	·63	·62	·67	·76	·88
30	+ ·78	+ ·91	+ ·97	+ 1·03	+ 1·09	+ 1·14	+ 1·19	+ 1·23	+ 1·28	+ 1·31	+ 1·28	+ 1·26	+ 1·22	+ 1·16	+ 1·04	+ ·92	+ ·81	+ ·70	+ ·63	+ ·57	+ ·55	+ ·55	+ ·59	+ ·67	+ ·78
Sept. 2	·64	·76	·81	·86	·90	·94	·99	1·02	1·06	1·09	1·07	1·05	1·01	·96	·87	·77	·67	·58	·53	·47	·46	·45	·49	·55	·64
5	·49	·58	·62	·65	·69	·72	·75	·78	·81	·83	·82	·80	·77	·73	·66	·58	·51	·45	·40	·36	·35	·35	·37	·42	·49
8	·33	·40	·42	·45	·47	·50	·52	·54	·56	·57	·56	·55	·53	·51	·46	·40	·35	·31	·28	·25	·24	·24	·26	·29	·33
11	·17	·20	·22	·23	·24	·26	·27	·28	·29	·29	·29	·28	·28	·26	·24	·21	·18	·16	·14	·13	·12	·12	·13	·15	·17
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

AMHERST.

Corrections to Heights of Low Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·12	+ ·11	+ ·11	+ ·11	+ ·10	+ ·10	+ ·09	+ ·09	+ ·09	+ ·09	+ ·10	+ ·10	+ ·11	+ ·11	+ ·12	+ ·13	+ ·14	+ ·16	+ ·16	+ ·16	+ ·16	+ ·15	+ ·14	+ ·13	+ ·12
22	·24	·23	·22	·21	·20	·19	·18	·18	·18	·19	·20	·20	·21	·23	·24	·27	·29	·31	·32	·33	·31	·29	·27	·25	·24
25	·34	·32	·32	·30	·29	·28	·26	·25	·26	·27	·28	·29	·30	·32	·35	·38	·42	·45	·47	·47	·45	·42	·39	·37	·34
28	·46	·43	·42	·41	·39	·37	·35	·34	·35	·37	·38	·40	·41	·43	·47	·51	·56	·61	·63	·64	·61	·57	·53	·49	·46
July 1	+ ·57	+ ·53	+ ·52	+ ·50	+ ·48	+ ·46	+ ·43	+ ·41	+ ·43	+ ·45	+ ·47	+ ·49	+ ·50	+ ·53	+ ·58	+ ·63	+ ·69	+ ·74	+ ·77	+ ·78	+ ·74	+ ·70	+ ·65	+ ·60	+ ·56
4	·67	·63	·62	·59	·57	·54	·51	·50	·51	·53	·55	·58	·60	·63	·68	·75	·81	·88	·91	·93	·88	·83	·77	·72	·67
7	·79	·74	·73	·70	·67	·64	·60	·58	·60	·63	·65	·68	·70	·74	·81	·88	·96	1·04	1·08	1·09	1·04	·98	·91	·84	·79
10	·88	·83	·81	·78	·74	·71	·67	·65	·67	·70	·73	·76	·78	·83	·90	·98	1·07	1·16	1·20	1·22	1·16	1·09	1·01	·94	·88
13	·97	·91	·89	·86	·82	·78	·74	·71	·73	·77	·80	·83	·86	·91	·99	1·08	1·18	1·27	1·32	1·34	1·27	1·20	1·11	1·03	·97
16	+1·06	+ ·99	+ ·97	+ ·94	+ ·89	+ ·85	+ ·81	+ ·78	+ ·80	+ ·84	+ ·87	+ ·91	+ ·94	+ ·99	+1·08	+1·18	+1·29	+1·39	+1·44	+1·46	+1·39	+1·31	+1·21	+1·13	+1·06
19	1·13	1·06	1·04	1·00	·96	·91	·86	·84	·86	·90	·93	·97	1·01	1·06	1·16	1·26	1·38	1·49	1·54	1·57	1·49	1·40	1·30	1·21	1·13
22	1·21	1·13	1·11	1·07	1·02	·97	·92	·89	·92	·96	1·00	1·04	1·08	1·13	1·23	1·34	1·47	1·59	1·64	1·67	1·59	1·49	1·39	1·29	1·21
25	1·27	1·19	1·16	1·12	1·07	1·02	·97	·93	·96	1·00	1·05	1·09	1·13	1·19	1·29	1·41	1·54	1·67	1·73	1·75	1·67	1·56	1·45	1·35	1·27
28	1·34	1·26	1·23	1·19	1·13	1·08	1·02	·99	1·02	1·06	1·11	1·15	1·20	1·26	1·37	1·49	1·63	1·76	1·83	1·83	1·76	1·65	1·52	1·42	1·34
31	+1·37	+1·29	+1·26	+1·21	+1·16	+1·10	+1·05	+1·01	+1·04	+1·09	+1·13	+1·19	+1·22	+1·29	+1·40	+1·53	+1·67	+1·80	+1·87	+1·90	+1·80	+1·69	+1·57	+1·46	+1·37
Aug. 3	1·42	1·33	1·30	1·25	1·20	1·14	1·08	1·04	1·07	1·12	1·17	1·22	1·26	1·33	1·44	1·58	1·72	1·86	1·93	1·96	1·86	1·75	1·62	1·51	1·42
6	1·45	1·36	1·33	1·28	1·22	1·16	1·11	1·07	1·10	1·14	1·19	1·24	1·29	1·36	1·47	1·61	1·76	1·90	1·97	2·00	1·90	1·78	1·66	1·54	1·45
9	1·48	1·39	1·36	1·31	1·25	1·19	1·13	1·09	1·12	1·17	1·21	1·27	1·32	1·39	1·50	1·64	1·79	1·94	2·01	2·04	1·94	1·82	1·69	1·57	1·48
12	1·49	1·40	1·37	1·32	1·26	1·20	1·14	1·10	1·13	1·18	1·23	1·28	1·33	1·40	1·52	1·66	1·81	1·96	2·03	2·06	1·96	1·84	1·71	1·59	1·49
15	+1·49	+1·40	+1·37	+1·32	+1·26	+1·20	+1·14	+1·10	+1·13	+1·18	+1·23	+1·28	+1·33	+1·40	+1·52	+1·66	+1·81	+1·96	+2·03	+2·06	+1·96	+1·84	+1·71	+1·59	+1·49
18	1·48	1·39	1·36	1·31	1·25	1·19	1·13	1·09	1·12	1·17	1·21	1·27	1·32	1·39	1·50	1·64	1·79	1·94	2·01	2·04	1·94	1·82	1·69	1·57	1·48
21	1·42	1·33	1·30	1·25	1·20	1·14	1·08	1·04	1·07	1·12	1·17	1·22	1·26	1·33	1·44	1·58	1·72	1·86	1·93	1·96	1·86	1·75	1·62	1·51	1·42
24	1·34	1·26	1·23	1·19	1·13	1·08	1·02	·99	1·02	1·06	1·11	1·15	1·20	1·26	1·37	1·40	1·63	1·76	1·83	1·83	1·76	1·65	1·52	1·42	1·34
27	1·21	1·13	1·11	1·07	1·02	·97	·92	·89	·92	·96	1·00	1·04	1·09	1·13	1·23	1·34	1·47	1·59	1·64	1·67	1·59	1·49	1·39	1·29	1·21
30	+1·06	+ ·99	+ ·97	+ ·94	+ ·89	+ ·85	+ ·81	+ ·78	+ ·80	+ ·84	+ ·87	+ ·91	+ ·94	+ ·99	+1·08	+1·18	+1·29	+1·39	+1·44	+1·46	+1·39	+1·31	+1·21	+1·13	+1·06
Sept. 2	·88	·83	·81	·78	·74	·71	·67	·65	·67	·70	·73	·76	·78	·83	·90	·98	1·07	1·16	1·20	1·22	1·16	1·09	1·01	·96	·88
5	·67	·63	·62	·59	·57	·54	·51	·50	·51	·53	·55	·58	·60	·63	·68	·75	·81	·88	·91	·93	·88	·83	·77	·72	·67
8	·46	·43	·42	·41	·39	·37	·35	·34	·35	·37	·38	·40	·41	·43	·47	·51	·56	·61	·63	·64	·61	·57	·53	·49	·46
11	·24	·23	·22	·21	·20	·19	·18	·18	·18	·19	·20	·20	·21	·23	·24	·27	·29	·31	·32	·33	·31	·29	·27	·25	·24
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

MOULMEIN.

Corrections to Times of High Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-3	-3	-3	-3	-3	-3	-3	-3	-3	-2	-2
22	5	5	5	5	5	5	5	5	5	5	4	4	5	5	5	6	6	6	6	6	6	5	5	5	5
25	7	7	7	7	7	7	7	7	7	7	6	6	7	7	7	8	9	9	9	9	8	7	7	7	7
28	9	9	9	9	9	9	9	9	9	9	9	9	9	9	10	11	12	12	12	12	11	10	10	10	9
July 1	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-12	-14	-15	-15	-15	-15	-14	-12	-12	-12	-11
4	14	14	14	14	14	14	14	14	14	14	13	13	14	14	15	16	17	18	18	17	16	15	14	14	14
7	16	16	16	16	16	16	16	16	15	15	15	15	15	16	18	19	20	21	21	20	19	18	17	16	16
10	18	18	18	18	18	18	18	18	17	17	16	16	17	18	20	21	22	24	23	22	21	20	19	18	18
13	20	20	20	20	20	20	20	20	19	19	18	18	19	20	21	23	25	26	25	25	23	21	21	20	20
16	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-20	-20	-21	-21	-23	-26	-27	-28	-28	-27	-26	-23	-23	-22	-21
19	23	23	23	23	23	23	23	23	22	22	21	21	22	23	25	27	29	30	30	29	27	25	24	24	23
22	24	24	24	24	24	24	24	24	24	24	23	23	24	24	27	29	31	32	32	31	29	27	26	25	24
25	26	26	26	26	26	26	26	26	25	25	24	24	25	26	28	31	32	34	33	32	31	28	27	26	26
28	27	27	27	27	27	27	27	27	26	26	25	25	26	27	29	32	34	36	35	34	32	29	28	27	27
31	-28	-28	-28	-28	-28	-28	-28	-28	-27	-27	-26	-26	-27	-28	-30	-33	-35	-37	-36	-35	-33	-30	-29	-29	-28
Aug. 3	29	29	29	29	29	29	29	29	28	28	27	27	28	29	31	34	36	38	37	36	34	31	30	29	29
6	29	29	29	29	29	29	29	29	28	28	27	27	28	29	32	35	37	39	38	37	35	32	31	30	29
9	30	30	30	30	30	30	30	30	29	29	28	28	29	30	33	36	38	40	39	38	36	33	32	31	30
12	30	30	30	30	30	30	30	30	29	29	28	28	29	30	33	36	38	40	39	38	36	33	32	31	30
15	-30	-30	-30	-30	-30	-30	-30	-30	-29	-29	-28	-28	-29	-30	-33	-36	-38	-40	-39	-38	-36	-33	-32	-31	-30
18	30	30	30	30	30	30	30	30	29	29	28	28	29	30	33	36	38	40	39	38	36	33	32	31	30
21	29	29	29	29	29	29	29	29	28	28	27	27	28	29	31	34	36	38	37	36	34	31	30	29	29
24	27	27	27	27	27	27	27	27	26	26	25	25	26	27	29	32	34	36	35	34	32	29	28	27	27
27	24	24	24	24	24	24	24	24	24	24	23	23	24	24	27	29	31	32	32	31	29	27	26	25	24
30	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-20	-20	-21	-21	-23	-26	-27	-28	-28	-27	-26	-23	-23	-22	-21
Sept. 2	18	18	18	18	18	18	18	18	17	17	16	16	17	18	20	21	22	24	23	22	21	20	19	18	18
5	14	14	14	14	14	14	14	14	14	14	13	13	14	14	15	16	17	18	18	17	16	15	14	14	14
8	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	11	12	12	12	12	11	9	10	10	9
11	5	5	5	5	5	5	5	5	5	5	4	4	5	5	5	6	6	6	6	6	6	5	5	5	5
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MOULMEIN.

Corrections to Times of Low Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
June 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 2	+ 2	+ 2	+ 2	+ 2	+ 2	+ 1	+ 1	0	0	0	0	0	0	0	0	+ 1
22	+ 1	1	2	2	2	2	3	3	3	4	4	5	4	3	2	1	+ 1	0	0	0	0	0	0	+ 1	1
25	1	2	2	3	3	3	4	4	5	6	7	7	6	5	3	2	1	0	0	0	0	0	0	1	1
28	2	2	3	3	4	4	5	6	7	8	9	9	8	6	4	2	2	+ 1	0	0	0	0	+ 1	1	2
July 1	+ 2	+ 3	+ 4	+ 4	+ 5	+ 5	+ 6	+ 7	+ 8	+ 10	+ 10	+ 11	+ 10	+ 8	+ 5	+ 3	+ 2	+ 1	0	0	0	0	+ 1	+ 2	+ 2
4	3	4	5	5	6	6	7	8	9	11	13	14	12	9	6	4	2	1	0	0	0	0	1	2	3
7	3	4	6	6	7	7	8	10	11	13	15	16	14	11	7	4	2	1	0	− 1	− 1	0	1	2	3
10	4	5	6	6	8	8	9	11	12	15	17	18	15	12	8	5	3	1	0	1	1	0	1	2	4
13	4	5	7	7	8	9	10	12	14	16	18	20	17	13	8	5	3	1	0	1	1	0	1	3	4
16	+ 4	+ 6	+ 7	+ 8	+ 9	+ 10	+ 11	+ 13	+ 15	+ 18	+ 20	+ 21	+ 18	+ 14	+ 9	+ 6	+ 4	+ 1	0	− 1	− 1	0	+ 1	+ 3	+ 4
19	5	6	8	8	10	11	12	14	16	19	21	23	20	15	10	6	4	2	0	1	1	0	2	3	5
22	5	6	8	9	11	11	13	15	17	20	23	24	21	16	11	6	4	2	0	1	1	0	2	3	5
25	5	7	9	9	11	12	14	15	18	21	24	26	22	17	11	7	4	2	0	1	1	0	2	3	5
28	5	7	9	10	12	12	14	16	19	22	25	27	23	18	12	7	4	2	0	1	1	0	2	4	5
31	+ 6	+ 7	+ 9	+ 10	+ 12	+ 13	+ 15	+ 17	+ 19	+ 23	+ 26	+ 28	+ 24	+ 18	+ 12	+ 7	+ 5	+ 2	0	− 1	− 1	0	+ 2	+ 4	+ 6
Aug. 3	6	8	10	10	12	13	15	17	20	24	27	29	25	19	12	8	5	2	0	1	1	0	2	4	6
6	6	8	10	11	13	14	16	17	20	24	27	29	25	19	13	8	5	2	0	1	1	0	2	4	6
9	6	8	10	11	13	14	16	18	21	25	28	30	26	20	13	8	5	2	0	1	1	0	2	4	6
12	6	8	10	11	13	14	16	18	21	25	28	30	26	20	13	8	5	2	0	1	1	0	2	4	6
15	+ 6	+ 8	+ 10	+ 11	+ 13	+ 14	+ 16	+ 18	+ 21	+ 25	+ 28	+ 30	+ 26	+ 20	+ 13	+ 8	+ 5	+ 2	0	− 1	− 1	0	+ 2	+ 4	+ 6
18	6	8	10	11	13	14	16	18	21	25	28	30	26	20	13	8	5	2	0	1	1	0	2	4	6
21	6	8	10	10	12	13	15	17	20	24	27	29	25	19	12	8	5	2	0	1	1	0	2	4	6
24	5	7	9	10	12	12	14	16	19	22	25	27	23	18	12	7	4	2	0	1	1	0	2	4	5
27	5	6	8	9	11	11	13	15	17	20	23	24	21	16	11	6	4	2	0	1	1	0	2	3	5
30	+ 4	+ 6	+ 7	+ 8	+ 9	+ 10	+ 11	+ 13	+ 15	+ 18	+ 20	+ 21	+ 18	+ 14	+ 9	+ 6	+ 4	+ 1	0	− 1	− 1	0	+ 1	+ 3	+ 4
Sept. 2	4	5	6	6	8	8	9	11	12	15	17	18	15	12	8	5	3	1	0	1	1	0	1	2	4
5	3	4	5	5	6	6	7	8	9	11	13	14	12	9	6	4	2	1	0	0	0	0	1	2	3
8	2	2	3	3	4	4	5	6	7	8	9	9	8	6	4	2	2	1	0	0	0	0	1	1	2
11	1	1	2	2	2	2	3	3	3	4	4	5	4	3	2	1	1	0	0	0	0	0	0	1	1
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MOULMEIN.

Corrections to Heights of High Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·25	+ ·25	+ ·26	+ ·27	+ ·28	+ ·28	+ ·29	+ ·29	+ ·29	+ ·28	+ ·28	+ ·27	+ ·26	+ ·26	+ ·24	+ ·22	+ ·21	+ ·20	+ ·21	+ ·21	+ ·22	+ ·23	+ ·23	+ ·24	+ ·25
22	·49	·51	·53	·54	·56	·57	·58	·58	·58	·57	·56	·54	·53	·51	·48	·44	·43	·41	·42	·43	·44	·45	·47	·48	·49
25	·71	·73	·76	·78	·80	·82	·83	·84	·83	·81	·80	·78	·76	·73	·69	·64	·61	·60	·60	·62	·63	·65	·67	·69	·71
28	·96	·99	1·02	1·05	1·08	1·10	1·12	1·13	1·12	1·10	1·08	1·05	1·03	1·00	·93	·87	·83	·80	·81	·83	·85	·88	·91	·93	·96
July 1	+1·17	+1·21	+1·25	+1·29	+1·33	+1·35	+1·38	+1·39	+1·37	+1·35	+1·32	+1·29	+1·26	+1·21	+1·14	+1·07	+1·01	+ ·99	+1·00	+1·02	+1·05	+1·08	+1·11	+1·14	+1·17
4	1·39	1·43	1·50	1·53	1·57	1·60	1·63	1·65	1·62	1·59	1·56	1·53	1·49	1·44	1·35	1·27	1·20	1·18	1·18	1·21	1·24	1·28	1·31	1·35	1·39
7	1·64	1·69	1·75	1·80	1·85	1·89	1·92	1·95	1·91	1·88	1·84	1·80	1·75	1·70	1·59	1·49	1·42	1·38	1·39	1·42	1·46	1·51	1·55	1·59	1·64
10	1·82	1·88	1·95	2·01	2·06	2·10	2·14	2·16	2·13	2·09	2·05	2·01	1·95	1·89	1·77	1·66	1·58	1·53	1·56	1·58	1·62	1·68	1·72	1·77	1·82
13	2·01	2·07	2·15	2·21	2·27	2·31	2·35	2·38	2·35	2·30	2·26	2·21	2·15	2·09	1·95	1·82	1·74	1·70	1·70	1·74	1·79	1·85	1·90	1·95	2·01
16	+2·19	+2·26	+2·34	+2·41	+2·48	+2·53	+2·57	+2·60	+2·56	+2·51	+2·46	+2·41	+2·35	+2·28	+2·13	+1·99	+1·90	+1·84	+1·86	+1·90	+1·95	+2·02	+2·07	+2·13	+2·19
19	2·35	2·42	2·51	2·58	2·65	2·71	2·75	2·78	2·74	2·69	2·64	2·58	2·52	2·43	2·28	2·12	2·01	1·98	1·99	2·04	2·09	2·16	2·22	2·28	2·35
22	2·50	2·58	2·67	2·75	2·83	2·88	2·93	2·96	2·92	2·87	2·81	2·75	2·68	2·60	2·43	2·27	2·16	2·10	2·12	2·17	2·23	2·30	2·37	2·43	2·50
25	2·63	2·70	2·81	2·89	2·97	3·03	3·08	3·11	3·07	3·01	2·95	2·89	2·81	2·72	2·55	2·39	2·27	2·21	2·23	2·28	2·34	2·41	2·48	2·55	2·63
28	2·75	2·83	2·97	3·06	3·11	3·17	3·22	3·26	3·21	3·15	3·09	3·06	2·95	2·84	2·70	2·50	2·38	2·31	2·33	2·39	2·45	2·53	2·60	2·70	2·75
31	+2·84	+2·93	+3·07	+3·17	+3·21	+3·28	+3·33	+3·37	+3·32	+3·26	+3·19	+3·17	+3·05	+2·94	+2·79	+2·58	+2·46	+2·40	+2·41	+2·47	+2·53	+2·61	+2·69	+2·79	+2·84
Aug. 3	2·94	3·02	3·14	3·23	3·32	3·38	3·44	3·48	3·43	3·36	3·30	3·23	3·14	3·04	2·85	2·67	2·54	2·48	2·49	2·55	2·61	2·70	2·77	2·85	2·94
6	3·00	3·08	3·20	3·29	3·39	3·45	3·51	3·55	3·50	3·43	3·37	3·29	3·21	3·10	2·91	2·71	2·59	2·52	2·54	2·60	2·67	2·75	2·83	2·91	3·00
9	3·06	3·15	3·27	3·37	3·46	3·52	3·58	3·62	3·57	3·50	3·44	3·37	3·28	3·17	2·97	2·78	2·64	2·58	2·59	2·65	2·72	2·81	2·89	2·97	3·06
12	3·09	3·18	3·30	3·40	3·49	3·56	3·62	3·66	3·61	3·54	3·47	3·40	3·31	3·20	3·00	2·80	2·67	2·60	2·62	2·68	2·75	2·84	2·92	3·00	3·09
15	+3·09	+3·18	+3·30	+3·40	+3·49	+3·56	+3·62	+3·66	+3·61	+3·54	+3·47	+3·40	+3·31	+3·20	+3·00	+2·80	+2·67	+2·60	+2·62	+2·68	+2·75	+2·84	+2·92	+3·00	+3·09
18	3·06	3·15	3·27	3·37	3·46	3·52	3·58	3·62	3·57	3·50	3·44	3·37	3·28	3·17	2·97	2·78	2·64	2·58	2·59	2·65	2·72	2·81	2·89	2·97	3·06
21	2·94	3·02	3·14	3·23	3·32	3·38	3·44	3·48	3·43	3·36	3·30	3·23	3·14	3·04	2·85	2·67	2·54	2·48	2·49	2·55	2·61	2·70	2·77	2·85	2·94
24	2·75	2·83	2·97	3·06	3·11	3·17	3·22	3·26	3·21	3·15	3·09	3·06	2·95	2·84	2·70	2·50	2·38	2·31	2·33	2·39	2·45	2·53	2·60	2·70	2·75
27	2·50	2·58	2·67	2·75	2·83	2·88	2·93	2·96	2·92	2·87	2·81	2·75	2·68	2·60	2·43	2·27	2·16	2·10	2·12	2·17	2·23	2·30	2·37	2·43	2·50
30	+2·19	+2·26	+2·34	+2·41	+2·48	+2·53	+2·57	+2·60	+2·56	+2·51	+2·46	+2·41	+2·35	+2·28	+2·13	+1·99	+1·90	+1·84	+1·86	+1·90	+1·95	+2·02	+2·07	+2·13	+2·19
Sept. 2	1·82	1·88	1·95	2·01	2·06	2·10	2·14	2·16	2·13	2·09	2·05	2·01	1·95	1·89	1·77	1·66	1·58	1·53	1·56	1·58	1·62	1·68	1·72	1·77	1·82
5	1·39	1·43	1·50	1·53	1·57	1·60	1·63	1·65	1·62	1·59	1·56	1·53	1·49	1·44	1·35	1·27	1·20	1·18	1·18	1·21	1·24	1·28	1·31	1·35	1·39
8	0·96	·99	1·02	1·05	1·08	1·10	1·12	1·13	1·12	1·10	1·08	1·05	1·03	1·00	·93	·87	·83	·80	·81	·83	·85	·88	·91	·93	·96
11	0·49	·51	·53	·54	·56	·57	·58	·58	·58	·57	·56	·54	·53	·51	·48	·44	·43	·41	·42	·43	·44	·45	·47	·48	·49
14	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

MOULMEIN.

Corrections to Heights of Low Water (Freshets Period).

Moon's Transit	h m 0 0	h m 0 30	h m 1 0	h m 1 30	h m 2 0	h m 2 30	h m 3 0	h m 3 30	h m 4 0	h m 4 30	h m 5 0	h m 5 30	h m 6 0	h m 6 30	h m 7 0	h m 7 30	h m 8 0	h m 8 30	h m 9 0	h m 9 30	h m 10 0	h m 10 30	h m 11 0	h m 11 30	h m 12 0
	feet	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*	*feet*
June 16	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00
19	+ ·56	+ ·57	+ ·57	+ ·57	+ ·57	+ ·57	+ ·57	+ ·57	+ ·57	+ ·57	+ ·57	+ ·56	+ ·56	+ ·56	+ ·55	+ ·55	+ ·55	+ ·55	+ ·54	+ ·54	+ ·54	+ ·54	+ ·55	+ ·56	+ ·56
22	1·12	1·13	1·13	1·14	1·14	1·15	1·15	1·15	1·14	1·14	1·13	1·13	1·12	1·11	1·11	1·10	1·10	1·09	1·09	1·08	1·08	1·09	1·10	1·11	1·12
25	1·61	1·63	1·63	1·64	1·64	1·65	1·65	1·65	1·64	1·64	1·63	1·62	1·62	1·60	1·59	1·58	1·58	1·57	1·56	1·55	1·56	1·57	1·58	1·60	1·61
28	2·17	2·19	2·20	2·21	2·22	2·22	2·22	2·22	2·21	2·20	2·19	2·18	2·17	2·16	2·15	2·13	2·12	2·11	2·10	2·10	2·10	2·11	2·13	2·15	2·17
July 1	+2·66	+2·69	+2·70	+2·71	+2·72	+2·72	+2·72	+2·72	+2·71	+2·70	+2·69	+2·68	+2·67	+2·64	+2·63	+2·61	+2·60	+2·59	+2·58	+2·57	+2·57	+2·59	+2·61	+2·64	+2·66
4	3·15	3·18	3·20	3·21	3·22	3·22	3·22	3·22	3·21	3·20	3·19	3·17	3·15	3·13	3·11	3·10	3·08	3·07	3·06	3·04	3·05	3·06	3·09	3·13	3·15
7	3·64	3·68	3·70	3·71	3·72	3·72	3·72	3·72	3·71	3·70	3·68	3·66	3·65	3·62	3·60	3·58	3·56	3·55	3·53	3·52	3·52	3·54	3·57	3·61	3·72
10	4·14	4·17	4·19	4·21	4·22	4·22	4·22	4·22	4·21	4·19	4·18	4·15	4·13	4·11	4·08	4·06	4·04	4·02	4·01	3·99	3·99	4·02	4·05	4·10	4·14
13	4·56	4·60	4·61	4·63	4·65	4·65	4·65	4·65	4·64	4·62	4·60	4·58	4·56	4·32	4·50	4·47	4·45	4·43	4·41	4·39	4·40	4·43	4·47	4·52	4·56
16	+4·98	+5·02	+5·04	+5·06	+5·08	+5·08	+5·08	+5·08	+5·07	+5·05	+5·03	+5·00	+4·98	+4·94	+4·91	+4·88	+4·86	+4·84	+4·82	+4·80	+4·81	+4·84	+4·88	+4·93	+4·98
19	5·33	5·37	5·40	5·42	5·43	5·44	5·44	5·44	5·43	5·40	5·38	5·35	5·32	5·29	5·26	5·23	5·21	5·18	5·16	5·14	5·15	5·18	5·22	5·28	5·33
22	5·68	5·73	5·76	5·78	5·79	5·80	5·80	5·80	5·78	5·76	5·73	5·70	5·68	5·64	5·61	5·57	5·55	5·52	5·50	5·48	5·48	5·52	5·56	5·63	5·68
25	5·98	6·01	6·03	6·06	6·08	6·09	6·09	6·09	6·07	6·04	6·02	5·98	5·96	5·92	5·88	5·85	5·82	5·80	5·77	5·75	5·75	5·79	5·84	5·91	5·96
28	6·24	6·29	6·31	6·35	6·36	6·37	6·37	6·37	6·35	6·33	6·30	6·27	6·23	6·19	6·16	6·12	6·10	6·07	6·04	6·02	6·03	6·06	6·11	6·19	6·24
31	+6·45	+6·50	+6·53	+6·56	+6·58	+6·59	+6·59	+6·59	+6·57	+6·54	+6·51	+6·48	+6·44	+6·40	+6·37	+6·33	+6·30	+6·27	+6·25	+6·22	+6·23	+6·27	+6·32	+6·39	+6·45
Aug. 3	6·66	6·72	6·74	6·77	6·79	6·80	6·80	6·80	6·78	6·75	6·73	6·69	6·66	6·61	6·57	6·54	6·51	6·48	6·45	6·42	6·43	6·47	6·53	6·60	6·66
6	6·80	6·86	6·89	6·92	6·94	6·95	6·95	6·95	6·93	6·90	6·87	6·83	6·80	6·75	6·71	6·67	6·64	6·62	6·59	6·56	6·57	6·61	6·66	6·74	6·80
9	6·94	7·00	7·02	7·06	7·08	7·09	7·09	7·09	7·07	7·04	7·01	6·97	6·94	6·89	6·85	6·81	6·78	6·75	6·72	6·69	6·70	6·74	6·80	6·88	6·94
12	7·01	7·07	7·10	7·13	7·15	7·16	7·16	7·16	7·14	7·11	7·08	7·04	7·00	6·96	6·92	6·88	6·85	6·82	6·79	6·76	6·77	6·81	6·87	6·95	7·01
15	+7·01	+7·07	+7·10	+7·13	+7·15	+7·16	+7·16	+7·16	+7·14	+7·11	+7·08	+7·04	+7·00	+6·96	+6·92	+6·88	+6·85	+6·82	+6·79	+6·76	+6·77	+6·81	+6·87	+6·95	+7·01
18	6·94	7·00	7·02	7·06	7·08	7·09	7·09	7·09	7·07	7·04	7·01	6·97	6·94	6·89	6·85	6·81	6·78	6·75	6·72	6·69	6·70	6·74	6·80	6·88	6·94
21	6·66	6·72	6·74	6·77	6·79	6·80	6·80	6·80	6·78	6·75	6·73	6·69	6·66	6·61	6·57	6·54	6·51	6·48	6·45	6·42	6·43	6·47	6·53	6·60	6·66
24	6·24	6·29	6·31	6·35	6·36	6·37	6·37	6·37	6·35	6·33	6·30	6·27	6·23	6·19	6·16	6·12	6·10	6·07	6·04	6·02	6·03	6·06	6·11	6·19	6·24
27	5·68	5·73	5·76	5·78	5·79	5·80	5·80	5·80	5·78	5·76	5·73	5·70	5·68	5·64	5·61	5·57	5·55	5·52	5·50	5·48	5·48	5·52	5·56	5·63	5·68
30	+4·98	+5·02	+5·04	+5·06	+5·08	+5·08	+5·08	+5·08	+5·07	+5·05	+5·03	+5·00	+4·98	+4·94	+4·91	+4·88	+4·86	+4·84	+4·82	+4·80	+4·81	+4·84	+4·88	+4·93	+4·98
Sept. 2	4·14	4·17	4·19	4·21	4·22	4·22	4·22	4·22	4·21	4·19	4·18	4·15	4·13	4·11	4·08	4·06	4·04	4·02	4·01	3·99	3·99	4·02	4·05	4·10	4·14
5	3·15	3·18	3·20	3·21	3·22	3·22	3·22	3·22	3·21	3·20	3·19	3·17	3·15	3·13	3·11	3·10	3·08	3·07	3·06	3·04	3·05	3·06	3·09	3·13	3·15
8	2·17	2·19	2·20	2·21	2·22	2·22	2·22	2·22	2·21	2·20	2·19	2·18	2·17	2·16	2·15	2·13	2·12	2·11	2·10	2·10	2·10	2·11	2·13	2·15	2·17
11	1·12	1·13	1·13	1·14	1·14	1·15	1·15	1·15	1·14	1·14	1·13	1·13	1·12	1·11	1·11	1·10	1·10	1·09	1·09	1·08	1·08	1·09	1·10	1·11	1·12
14	·00	·0c	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00	·00

TIDAL OBSERVATIONS

PART II.

HISTORY AND DESCRIPTION OF THE OBSERVATORIES,

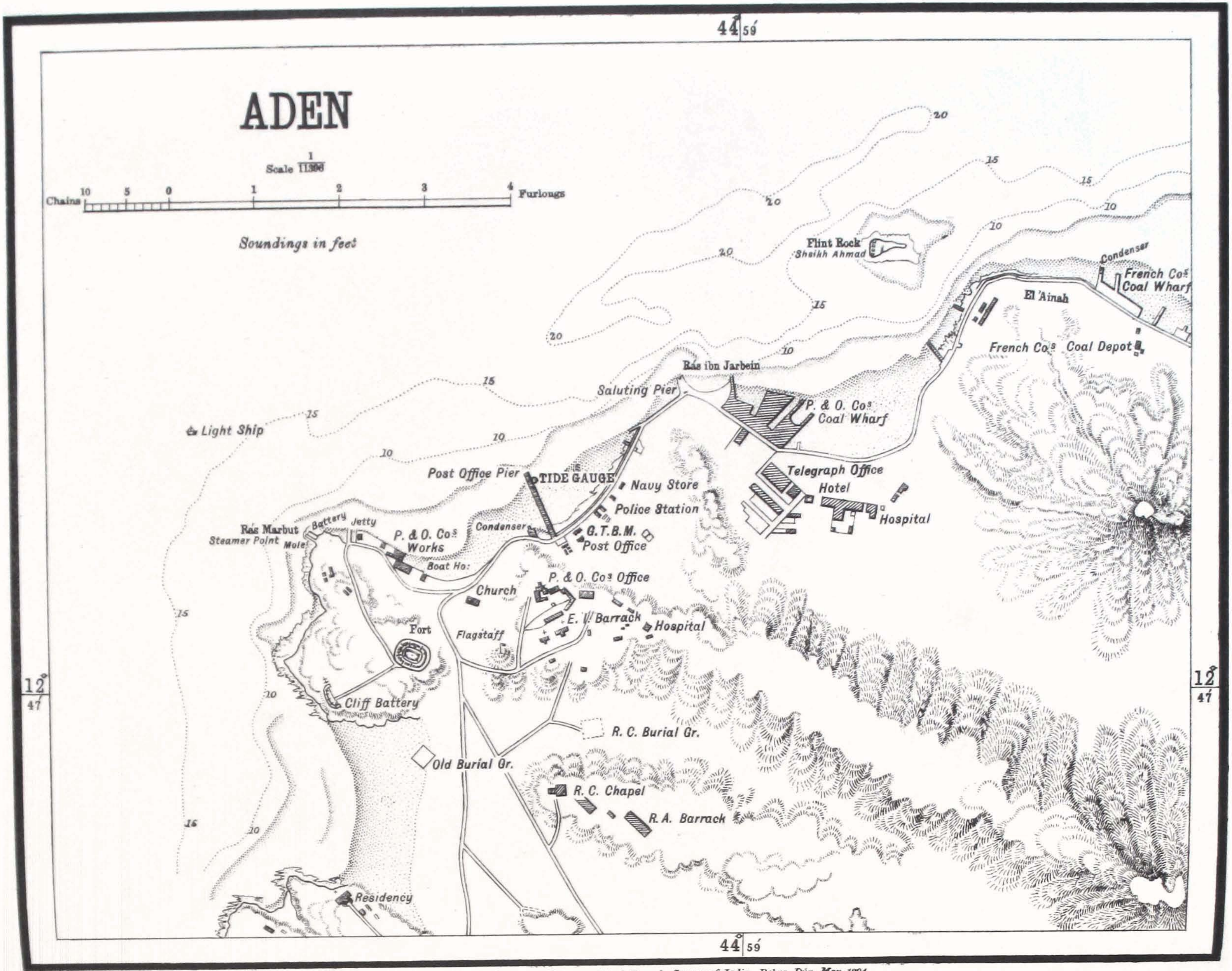
RESULTS OF THE OBSERVATIONS,

AND

VALUES OF THE TIDAL CONSTANTS,

UP TO

1892.



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dūn. May 1894.

ADEN.

(Tidal Observatory, Lat. 12° 47′ N., Long. 44° 59′ E.)

The tidal observatory at Aden, on the south coast of Arabia, is one of the permanent observatories, and is situated in the angle formed by the T-head of the end of the Post Office pier, in the position shown in the accompanying chart. It is a wooden structure built on piles driven eight or nine feet into the bed of the sea. The cylinder is circular and of wrought iron, about twenty-two inches in internal diameter and sixteen feet long, closed at the bottom and resting on the bed of the sea, there being never less than three feet of water above the bottom even at the lowest tides.

The working scale of the tide-gauge is one-half.

Registrations were commenced on the 3rd March, 1879, and were very satisfactory up to the 17th March, 1890. From the latter date to the 31st May, 1890, when a new gauge was set up, the observations were rendered untrustworthy through the negligence of the clerk. With this exception, the observations have proved satisfactory. When the gauge was originally set up there was a short communication pipe, having two bends, and a "rose" at its end, attached to the cylinder near the bottom. The rose was fifteen inches above the bed of the sea. At the inspection in August, 1886, this arrangement was found to have disappeared without entailing any bad consequences; and it has not been necessary to renew it. Prior to the commencement of these registrations a small gauge was at work for a considerable time, but its registrations were found to be useless.

A peculiarity of the Aden tides is, that at the times of the moon's quarters there is frequently only one high and one low water in the twenty-four hours.

The disturbances of the surface of the ocean, caused by the Krakatoa volcanic eruptions, were recorded at this the most remote Indian Tidal Station by the self-registering tide-gauge on the 27th August, 1883.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory, but as that site was not suitable for the anemometer, the latter instrument was placed on the Flag-staff hill, about a quarter of a mile inland.

The bench-mark of reference is a large stone in the north-east corner of the Post Office verandah pavement, having its face flush with the pavement, and the letters G.T.S. □ B.M. engraved on it. It is 13·489 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = VII^{h} 54^{m}.

The highest high water recorded was 10·1 feet above the zero of the gauge, and occurred in April, 1879.

The lowest low water recorded was 0·1 of a foot above the zero of the gauge, and occurred in November, 1879.

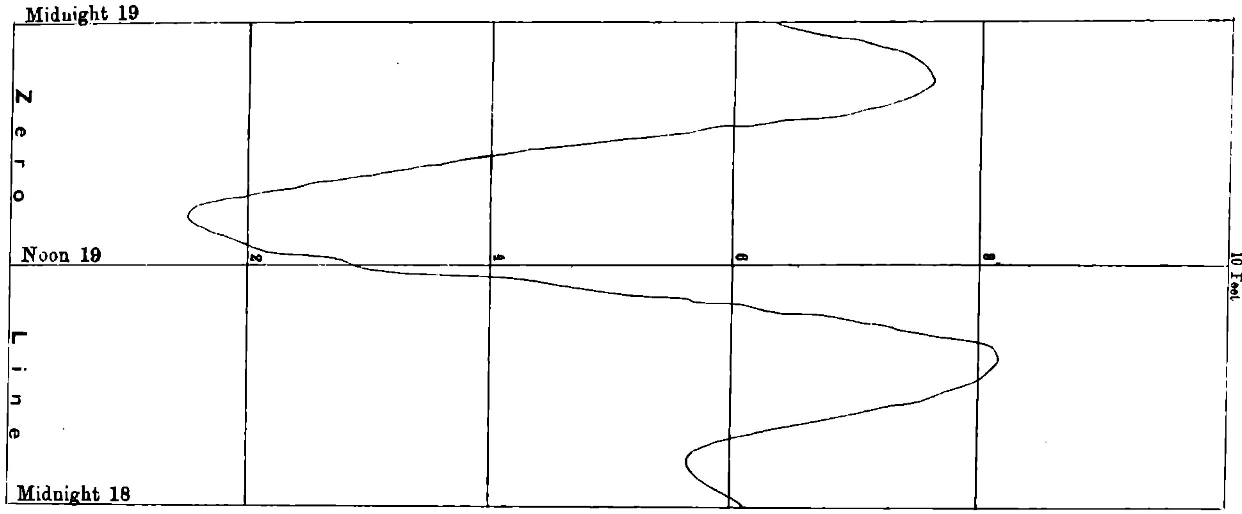
In 1879-80 the mean range of largest ordinary springs was found to be 6·7 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1879-80	5·768 feet.
1880-81	5·784 „
1881-82	5·814 „
1882-83	5·754 „
1883-84	5·800 „
1884-85	5·849 „
1885-86	5·883 „
1886-87	5·902 „
1887-88	5·822 „
1888-89	5·857 „
1889-90	5·835 „
1890-91	5·780 „
1891-92	5·845 „

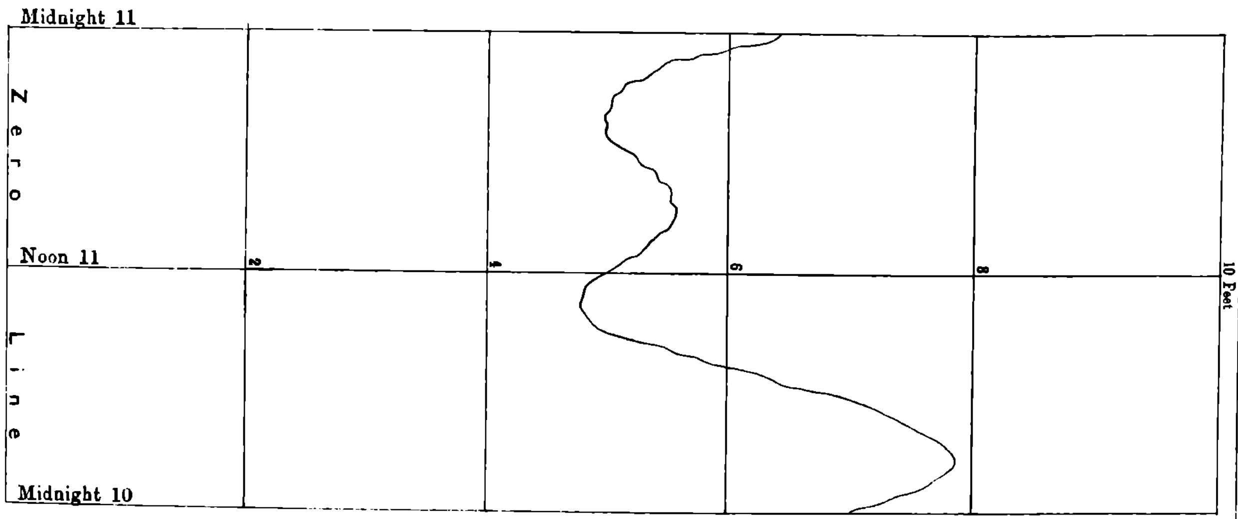
TIDAL CURVES
at
ADEN

Spring Tide — 19th December 1888



Full Moon — 18th December 1888

Neap Tide — 11th December 1888



First Quarter — 10th December 1888

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún June 1899.

Regr. No. D. 122, S. I. D. - May 99 – 500

Values of H's *at Aden.*

Tide	H						Tide
	1879-80	1880-81	1881-82	1882-83	1883-84	1884-85	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·073	0·117	0·093	0·077	0·094	0·074	S_1
S_2	·693	·693	·704	·699	·702	·700	S_2
S_4	·006	·005	·006	·005	·004	·004	S_4
S_6	·005	·004	·004	·004	·006	·006	S_6
S_8	·001	·001	·001	·001	·001	·001	S_8
M_1	·033	·052	·053	·048	·066	·084	M_1
M_2	1·578	1·558	1·569	1·567	1·588	1·581	M_2
M_3	0·019	0·020	0·018	0·016	0·019	0·014	M_3
M_4	·011	·006	·007	·003	·004	·003	M_4
M_6	·006	·004	·004	·007	·006	·005	M_6
M_8	·003	·001	·004	·002	·003	·001	M_8
O	·657	·658	·646	·651	·660	·670	O
K_1	1·295	1·297	1·299	1·305	1·312	1·303	K_1
K_2	0·218	0·197	0·188	0·202	0·215	0·206	K_2
P	·389	·375	·389	·399	·384	·399	P
J	·118	·110	·083	·100	·131	·099	J
Q	·174	·157	·134	·139	·158	·144	Q
L	·023	·063	·033	·065	·028	·047	L
N	·443	·436	·421	·409	·423	·434	N
λ	·018	·020	·038	·026	·015	·037	λ
ν	·157	·132	·059	·048	·139	·156	ν
μ	·086	·082	·072	·058	·081	·083	μ
R	...	·006	...	·003	...	·019	R
T	...	·057	...	·042	...	·081	T
MS	·007	·020	·009	·011	·012	·014	MS
2SM	·022	·021	·021	·026	·022	·021	2SM
2N	·084	·101	·079	·058	·087	·107	2N
M_2N	·035	·020	·077	·037	·044	·036	M_2N
M_2K_1	·031	·027	·011	·023	·034	·033	M_2K_1
$2M_2K_1$	·009	·006	·009	·011	·007	·006	$2M_2K_1$
Mm	·035	·076	·025	·033	·015	·039	Mm
Mf	·052	·039	·045	·044	·065	·012	Mf
MSf	·014	·015	·016	·010	·012	·019	MSf
Sa	·404	·402	·353	·399	·363	·367	Sa
Ssa	·110	·109	·093	·069	·114	·102	Ssa

Values of H's *at Aden*—(Continued).

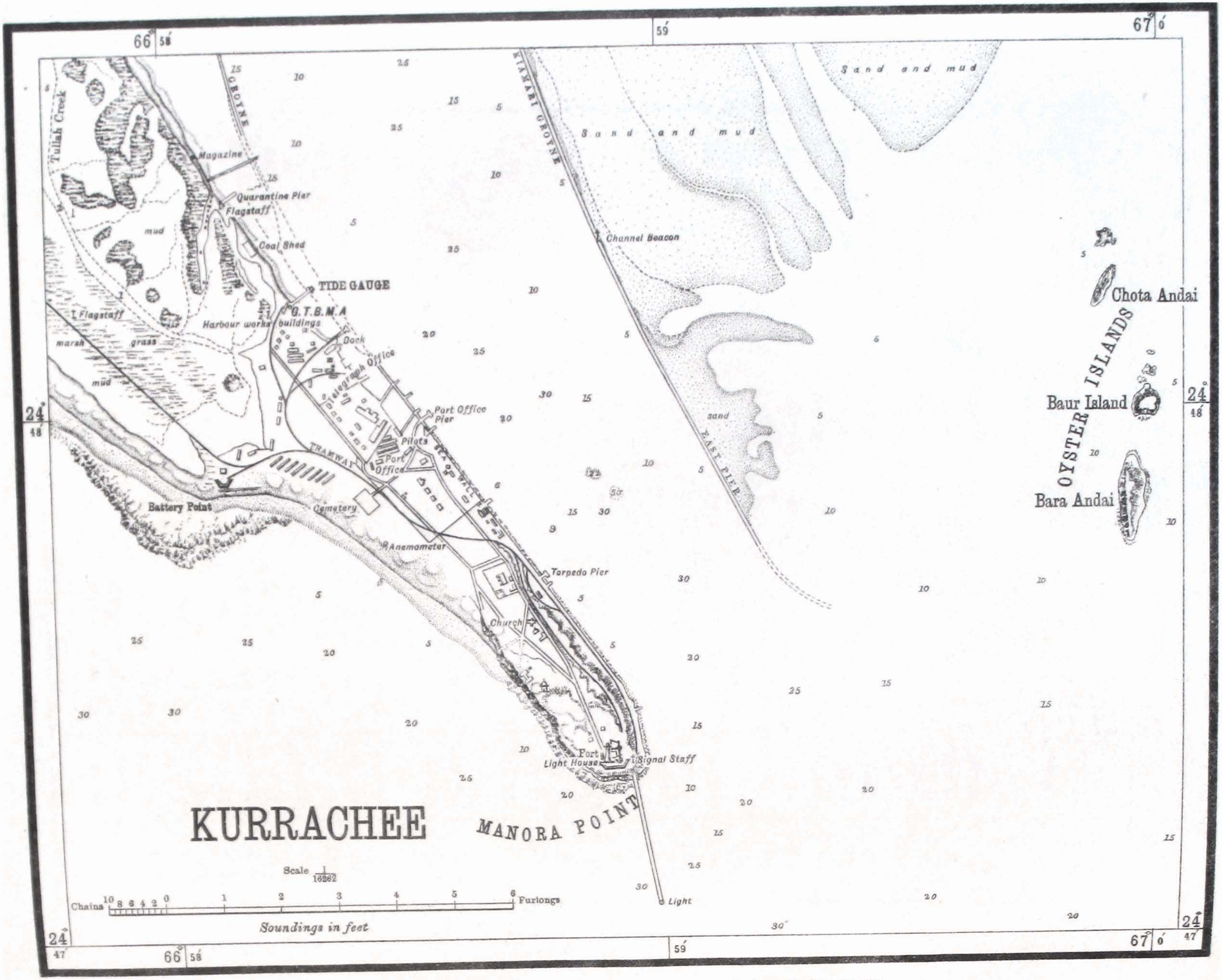
Tide	H							Tide
	1885-86	1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	
	Feet	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·077	0·070	0·095	0·090	0·101	0·080	0·101	S_1
S_2	·692	·700	·700	·706	·682	·652	·656	S_2
S_4	·005	·004	·005	·004	·002	·006	·006	S_4
S_6	·005	·006	·006	·006	·008	·006	·005	S_6
S_8	·002	·001	·002	·001	·001	·002	·000	S_8
M_1	·015	·036	·030	·035	·034	·079	·050	M_1
M_2	1·573	1·570	1·594	1·579	1·566	1·564	1·576	M_2
M_3	0·021	0·019	0·018	0·021	0·019	0·019	0·017	M_3
M_4	·008	·006	·008	·004	·004	·008	·005	M_4
M_6	·003	·005	·006	·006	·002	·006	·002	M_6
M_8	·002	·003	·001	·002	·004	·003	·001	M_8
O	·669	·666	·666	·660	·654	·642	·652	O
K_1	1·307	1·301	1·307	1·306	1·311	1·289	1·309	K_1
K_2	0·195	0·213	0·206	0·194	0·206	0·233	0·192	K_2
P	·409	·391	·388	·401	·413	·343	·373	P
J	·067	·087	·119	·102	·083	·143	·135	J
Q	·136	·147	·169	·162	·145	·177	·155	Q
L	·034	·048	·026	·045	·025	·026	·059	L
N	·444	·428	·446	·452	·426	·451	·411	N
λ	·033	...	...	...	...	...	...	λ
ν	·090	·007	·098	·158	·128	·065	·061	ν
μ	·080	·056	·074	·075	·101	·064	·080	μ
R	...	...	...	...	...	...	...	R
T	...	·027	·035	·088	·067	·008	·055	T
MS	·006	·011	·009	·017	·014	·013	·016	MS
2SM	·019	·024	·020	·018	·025	·037	.024	2SM
2N	·091	·067	·088	·089	·095	·080	·074	2N
M_2N	·065	·031	·034	·043	·056	·028	·024	M_2N
M_2K_1	·011	·021	·033	·027	·009	·028	·032	M_2K_1
$2M_3K_1$	·003	·001	·006	·007	·012	·014	·008	$2M_2K_1$
Mm	·016	·037	·050	·055	·029	·018	·031	Mm
Mf	·038	·065	·028	·046	·043	·045	·047	Mf
MSf	·013	·015	·018	·010	·024	·002	·014	MSf
Sa	·448	·403	·416	·296	·381	·424	·346	Sa
Ssa	·183	·166	·152	·116	·083	·161	·141	Ssa

Values of κ's at Aden.

Tide	κ						Tide
	1879-80	1880-81	1881-82	1882-83	1883-84	1884-85	
	°	°	°	°	°	°	
S_1	167·95	151·17	161·49	165·96	165·00	173·69	S_1
S_2	248·43	251·51	246·32	247·25	244·77	244·76	S_2
S_4	263·00	256·55	274·76	289·80	244·06	6·95	S_4
S_6	217·78	190·71	209·58	185·44	185·01	188·43	S_6
S_8	212·01	238·00	325·01	260·54	221·63	265·60	S_8
M_1	29·53	12·18	355·47	44·91	30·54	35·62	M_1
M_2	228·41	232·03	227·53	227·33	224·80	224·98	M_2
M_3	219·59	214·88	201·36	201·77	204·92	212·12	M_3
M_4	322·03	333·52	317·91	280·95	346·08	325·77	M_4
M_6	343·05	279·82	25·74	355·00	358·12	317·12	M_6
M_8	87·29	48·55	332·61	65·39	146·48	84·26	M_8
O	38·44	39·87	37·94	37·54	37·56	37·04	O
K_1	36·34	38·10	35·58	35·80	34·47	34·24	K_1
K_2	245·03	243·79	242·11	246·15	233·71	233·53	K_2
P	31·19	35·47	33·45	31·44	30·81	31·75	P
J	48·56	70·31	53·24	35·32	39·41	57·30	J
Q	39·64	37·98	41·55	47·91	39·63	29·14	Q
L	259·45	230·25	209·23	222·81	194·11	223·65	L
N	222·92	229·98	223·71	222·03	217·27	217·09	N
λ	122·72	301·16	210·44	155·15	135·12	258·74	λ
ν	241·49	200·36	169·87	292·80	254·24	213·74	ν
μ	191·74	203·97	182·34	204·45	193·20	192·91	μ
R	...	63·81	...	355·89	...	242·44	R
T	...	286·13	...	194·49	...	275·15	T
MS	136·41	166·88	166·20	167·05	138·22	131·37	MS
2SM	106·46	100·58	113·80	113·66	106·56	107·69	2SM
2N	195·92	195·96	203·92	180·93	188·17	176·75	2N
M_2N	55·99	335·56	19·90	59·03	71·77	334·74	M_2N
M_2K_1	339·10	57·39	125·52	285·53	337·56	43·14	M_2K_1
$2M_2K_1$	64·28	43·88	6·97	344·82	308·51	282·26	$2M_2K_1$
Mm	4·62	347·81	324·13	17·90	57·50	53·33	Mm
Mf	14·44	30·38	25·83	53·22	15·75	35·75	Mf
MSf	40·02	295·48	98·32	209·21	231·08	264·87	MSf
Sa	2·72	358·03	1·62	346·98	346·01	356·05	Sa
Ssa	94·16	160·57	150·93	98·61	122·51	158·75	Ssa

Values of κ's at Aden—(Continued).

Tide	κ							Tide
	1885-86	1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	
	°	°	°	°	°	°	°	
S_1	162·20	170·58	169·20	173·82	173·08	181·51	169·91	S_1
S_2	245·33	246·98	245·89	244·89	243·39	242·60	244·36	S_2
S_4	323·62	318·24	326·63	311·50	281·31	278·26	245·56	S_4
S_6	220·86	214·19	208·86	194·28	201·40	193·57	193·17	S_6
S_8	334·98	340·02	341·57	50·19	323·13	135·00	161·57	S_8
M_1	58·21	97·46	66·27	357·75	267·29	52·96	36·20	M_1
M_2	225·76	226·71	225·89	225·54	223·58	224·68	225·79	M_2
M_3	225·63	219·24	218·63	209·11	181·48	209·19	202·52	M_3
M_4	338·84	331·95	340·35	309·55	308·40	238·87	320·25	M_4
M_6	14·06	350·46	8·62	326·07	300·79	319·64	33·44	M_6
M_8	20·82	114·46	123·57	39·02	51·28	210·47	244·04	M_8
O	36·93	36·75	36·55	36·74	35·36	35·81	36·61	O
K_1	35·00	35·62	34·88	34·62	33·63	34·00	33·88	K_1
K_2	245·84	244·04	237·64	238·38	238·53	235·93	235·26	K_2
P	31·64	31·11	32·15	32·39	29·95	25·44	30·20	P
J	44·53	28·15	44·93	68·78	50·81	21·29	41·48	J
Q	34·55	43·04	35·86	32·10	39·91	52·92	43·56	Q
L	196·90	229·34	185·24	232·68	228·88	315·91	193·27	L
N	219·56	221·25	219·07	220·86	219·17	223·48	218·76	N
λ	200·60	...	...	...	...	...	...	λ
ν	179·76	235·17	274·84	232·09	192·56	154·97	281·89	ν
μ	180·00	194·49	191·68	193·98	177·12	188·56	196·24	μ
R	...	...	...	...	...	...	...	R
T	...	173·99	321·19	268·47	222·90	108·51	309·50	T
MS	173·08	146·30	129·14	142·32	149·12	143·26	179·83	MS
2SM	109·08	109·23	99·75	115·14	92·14	72·86	96·77	2SM
2N	198·94	193·88	195·68	178·28	197·27	194·69	194·28	2N
M_2N	37·16	50·28	87·31	341·48	55·03	102·66	94·59	M_2N
M_2K_1	135·73	267·85	336·41	47·81	138·27	279·43	340·12	M_2K_1
$2M_2K_1$	321·94	105·73	73·31	13·02	5·96	344·11	338·15	$2M_2K_1$
Mm	1·28	70·41	29·60	11·99	354·74	29·95	6·36	Mm
Mf	14·40	10·07	342·31	19·01	12·45	341·79	351·57	Mf
MSf	189·36	110·27	84·87	90·82	222·95	186·11	295·77	MSf
Sa	3·41	11·16	345·29	357·53	355·76	355·07	352·31	Sa
Ssa	144·18	146·86	144·10	130·16	117·96	105·97	97·08	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dūn, September 1893

KURRACHEE.

(*Tidal Observatory, Lat.* $24° 48'$ *N., Long.* $66° 58'$ *E.*)

The tidal observatory at Kurrachee on the coast of Sind is one of the permanent observatories, and is situated alongside the end of the 'Tipping pier' on the Manora side of the Harbour, in the position shown on the accompanying chart. It is a substantial, isolated wooden structure, built on piles driven from eight to twelve feet into the ground. The cylinder is an iron screw pile of about two feet four inches internal diameter and seventeen feet six inches long, driven about two feet into the ground, and firmly braced to the observatory joists; the intention being that there should be about one foot of the cylinder above the highest tides, and about four feet of water within it at the lowest tides. The communication is by a hole one inch in diameter, drilled through the cylinder at a depth of fifteen feet eight inches below the top flange.

The working scale of the tide-gauge is one-third.

Registrations were commenced on the 1st January, 1881, and have been highly satisfactory, though occasionally the curves have slight imperfections due to shell fish blocking the communication; and in 1892 silt accumulated to such an extent that extreme high and low tides were not properly indicated, owing to the float at extreme low water and the counterpoise at extreme high water resting on the accumulation, which was removed in January, 1893. Prior to the commencement of these registrations, a small self-registering tide-gauge was at work between 1868 and 1880 in connection with the Kurrachee Harbour Works, and its observations have been utilised together with those of the larger instrument. The disturbances of the surface of the ocean, caused by the Krakatoa volcanic eruptions, were recorded at this tidal station by the self-registering tide-gauge on the 27th August, 1883.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations.

The barometer was placed in the observatory, and the anemometer fixed to the exterior of the same building but its use was discontinued as that site was found to be inferior to that of the Port-Trust Anemometer on a neighbouring hillock, and the observations of the latter instrument have been accepted since December, 1881.

The bench-mark of reference is a stone, about half a furlong S.W. of the observatory, marked G.T.S. □Δ B.M.. It is 16·139 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = X^h 19^m.

The highest high water recorded was 13·4 feet above the zero of the gauge and occurred in June, 1885.

The lowest low water recorded was 0·4 foot above the zero of the gauge and occurred in November, 1879.

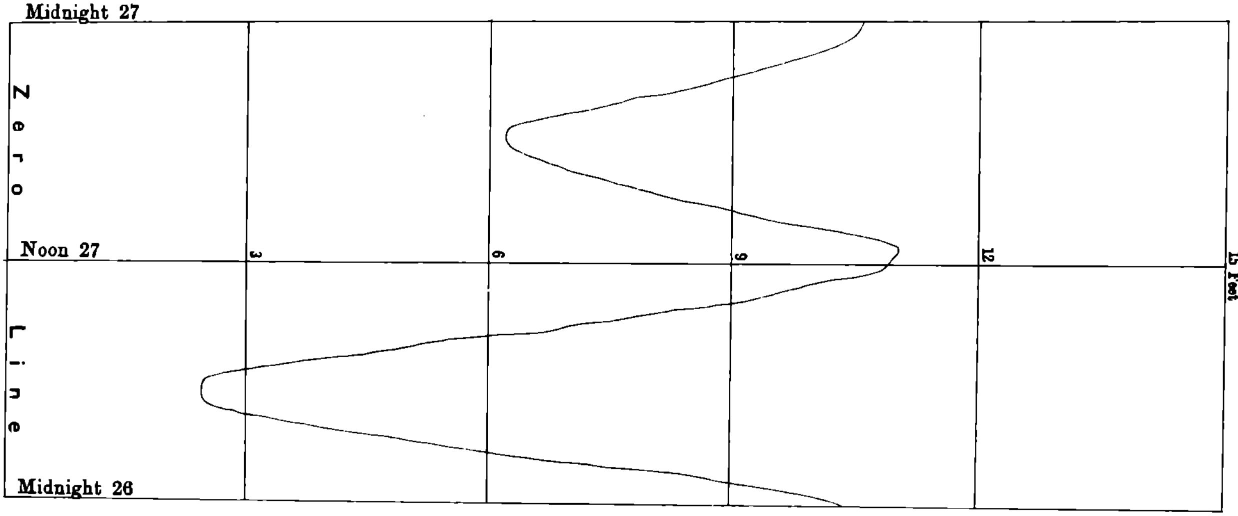
In 1890 the mean range of largest ordinary springs was found to be 9·3 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

By small gauge.			*By large gauge.*		
1868-69	7·149	feet.	1881-82	7·179	feet.
1869-70	·291	„	1882-83	·060	„
1870-71	·264	„	1883-84	·192	„
1871-72	·107	„	1884-85	·198	„
1872-73	·051	„	1885-86	·206	„
1873-74	·079	„	1886-87	·225	„
1874-75	·152	„	1887-88	·152	„
1875-76	·153	„	1888-89	·133	„
1876-77	·134	„	1889-90	·155	„
1877-78	·207	„	1890-91	·143	„
1878-79	·331	„	1891-92	·114	„
1879-80	·308	„			
1880-81	·267	„			

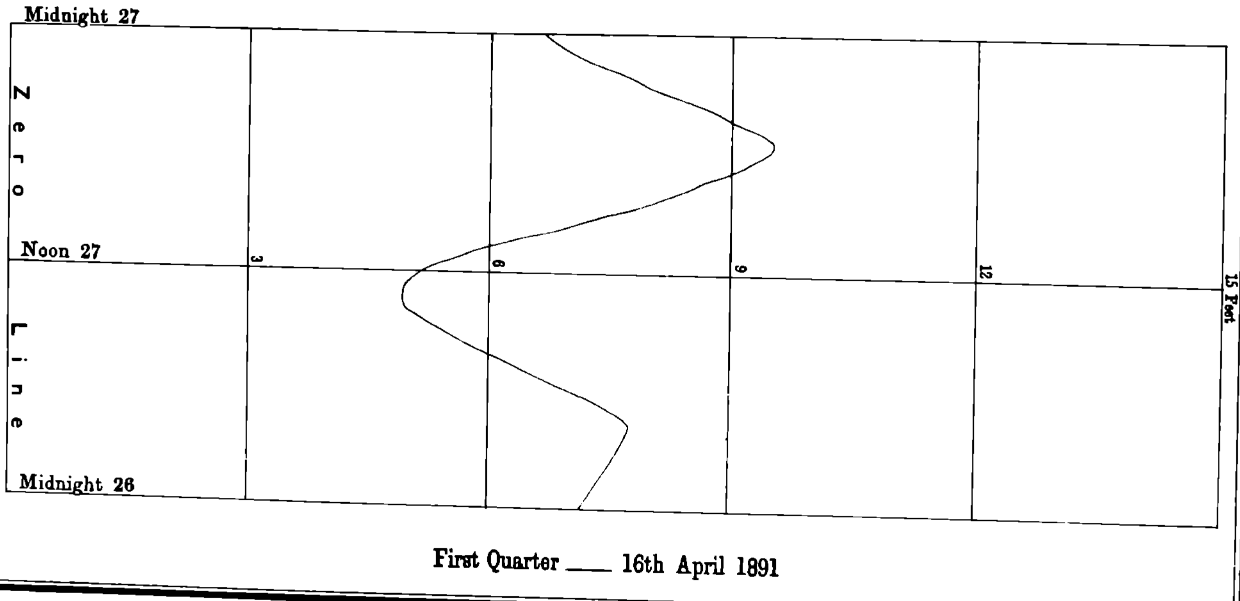
TIDAL CURVES
at
KURRACHEE

Spring Tide — 27th April 1891



Full Moon — 24th April 1891

Neap Tide — 17th April 1891



First Quarter — 16th April 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India. Dehra Dun. July 1899.

Regr. No. D. 191, S. I. D. - May 99 - 500

Values of H's *at Kurrachee.*

Tide	H						Tide
	1868-69	1869-70	1870-71	1871-72	1872-73	1873-74	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·072	0·071	0·075	0·083	0·108	0·083	S_1
S_2	·932	·943	·923	·951	·952	·943	S_2
S_4	...	...	·014	·013	·008	·010	S_4
S_6	...	...	...	·004	·012	·004	S_6
S_8	...	...	...	...	...	·000	S_8
M_1	·013	...	·030	·063	·040	·038	M_1
M_2	2·511	2·447	2·450	2·492	2·476	2·471	M_2
M_3	0·042	0·037	0·048	0·048	0·037	0·030	M_3
M_4	·016	·027	·024	·029	·020	·022	M_4
M_6	·040	·046	·044	·045	·046	·048	M_6
M_8	...	...	...	·006	·006	·003	M_8
O	·662	·645	·629	·636	·632	·645	O
K_1	1·278	1·257	1·255	1·279	1·275	1·269	K_1
K_2	0·299	0·273	0·260	0·293	0·292	0·274	K_2
P	·376	·385	·375	·360	·368	·393	P
J	·091	·046	·070	·107	·104	·059	J
Q	·129	·120	·138	·146	·129	·119	Q
L	·079	·047	·089	·043	·137	·084	L
N	·604	·587	·572	·650	·605	·587	N
λ	·059	·037	·043	·084	·076	·041	λ
ν	·190	·081	·080	·143	·191	·116	ν
μ	·066	·032	·070	·062	·055	·055	μ
R	...	·035	...	·027	...	·021	R
T	...	·111	...	·058	...	·012	T
MS	·017	·024	·031	·020	...	·023	MS
2SM	...	...	...	...	...	·007	2SM
2N	...	...	...	...	...	...	2N
M_2N	...	...	...	...	...	...	M_2N
M_2K_1	...	...	...	...	...	...	M_2K_1
$2M_2K_1$	...	...	...	...	...	...	$2M_2K_1$
Mm	·069	·040	·031	...	...	·055	Mm
Mf	·053	·078	·037	...	...	·012	Mf
MSf	·009	·074	·057	...	...	·042	MSf
Sa	·115	·179	·162	...	...	·250	Sa
Ssa	·198	·059	·062	...	...	·211	Ssa

Values of H's *at Kurrachee*—(Continued).

Tide	H 1874-75	1875-76	1876-77	1877-78	1878-79	1879-80	Tide
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·076	0·079	0·087	0·088	0·044	0·086	S_1
S_2	·949	·953	·936	·961	·922	·957	S_2
S_4	·008	·008	·012	·010	·009	·008	S_4
S_6	·007	·009	·006	·005	·008	·006	S_6
S_8	·003	·002	·001	·002	·001	·002	S_8
M_1	·055	·081	·015	·013	·035	·060	M_1
M_2	2·517	2·550	2·474	2·468	2·521	2·555	M_2
M_3	0·026	0·037	0·037	0·055	0·048	0·042	M_3
M_4	·020	·025	·019	·024	·031	·027	M_4
M_6	·056	·055	·049	·053	·051	·055	M_6
M_8	·006	·006	·006	·006	·004	·003	M_8
O	·647	·649	·646	·654	·677	·654	O
K_1	1·292	1·296	1·263	1·278	1·314	1·301	K_1
K_2	0·247	0·261	0·276	0·260	0·240	0·284	K_2
P	·386	·367	·368	·423	·440	·396	P
J	·088	·104	·077	·025	·084	·102	J
Q	·123	·136	·124	·110	·150	·154	Q
L	·088	·042	·085	·099	·054	·066	L
N	·560	·602	·606	·556	·667	·597	N
λ	·022	·009	·040	·082	·063	·019	λ
ν	·023	·154	·207	·218	·127	·089	ν
μ	·056	·070	·068	·113	·041	·077	μ
R	...	...	·008	...	·069	...	R
T	...	...	·122	...	·059	...	T
MS	·021	·031	·034	·030	·033	·031	MS
2SM	·018	·025	·012	·026	·019	·018	2SM
2N	...	...	...	...	...	...	2N
M_2N	...	...	...	...	...	...	M_2N
M_2K_1	...	...	...	...	...	...	M_2K_1
$2M_2K_1$	...	...	...	...	...	...	$2M_2K_1$
Mm	·064	·067	·097	·124	...	·040	Mm
Mf	·038	·010	·032	·047	...	·030	Mf
MSf	·040	·015	·045	·038	...	·030	MSf
Sa	·149	·086	·197	·170	...	·042	Sa
Ssa	·172	·173	·145	·087	...	·165	Ssa

Values of H's *at Kurrachee*—(Continued).

Tide	H						Tide
	1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·135	0·076	0·066	0·074	0·055	0·072	S_1
S_2	·969	·960	·962	·952	·963	·950	S_2
S_4	·006	·012	·008	·010	·011	·010	S_4
S_6	·006	·008	·006	·006	·005	·006	S_6
S_8	·001	·000	·001	·002	·001	·001	S_8
M_1	·059	·048	·062	·081	·042	·037	M_1
M_2	2·536	2·541	2·558	2·566	2·546	2·552	M_2
M_3	0·039	0·034	0·030	0·029	0·027	0·036	M_3
M_4	·026	·027	·023	·033	·029	·029	M_4
M_6	·052	·049	·044	·050	·045	·053	M_6
M_8	·002	·009	·002	·005	·001	·005	M_8
O	·632	·654	·645	·662	·666	·663	O
K_1	1·246	1·295	1·310	1·301	1·300	1·305	K_1
K_2	0·415	0·269	0·234	0·304	0·308	0·269	K_2
P	·266	·396	·396	·392	·395	·407	P
J	·066	·063	·099	·111	·071	·040	J
Q	·104	·124	·132	·133	·111	·125	Q
L	·123	·096	·076	·053	·076	·075	L
N	·581	·631	·594	·588	·596	·623	N
λ	·020	·029	·001	·006	·065	·066	λ
ν	·169	·211	·125	·028	·179	·208	ν
μ	·037	·081	·039	·064	·041	·084	μ
R	·040	...	·009	...	·019	...	R
T	·094	...	·021	...	·126	...	T
MS	·028	·030	·024	·032	·025	·035	MS
2SM	·031	·030	·021	·028	·017	·020	2SM
2N	...	·107	·064	·110	·084	·109	2N
M_2N	...	·057	·081	·040	·067	·099	M_2N
M_2K_1	...	·035	·061	·068	·020	·024	M_2K_1
$2M_2K_1$	...	·016	·025	·028	·023	·019	$2M_2K_1$
Mm	·036	·055	·040	·022	·027	·064	Mm
Mf	·020	·034	·006	·061	·058	·076	Mf
MSf	·018	·043	·023	·012	·037	·064	MSf
Sa	·102	·100	·099	·089	·139	·224	Sa
Ssa	·139	·116	·098	·189	·137	·109	Ssa

Values of H's *at Kurrachee*—(Continued).

Tide	H 1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	Tide
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·077	0·085	0·079	0·087	0·095	0·093	S_1
S_2	·972	·964	·966	·963	·946	·945	S_2
S_4	·008	·009	·011	·013	·010	·009	S_4
S_6	·010	·006	·007	·006	·007	·008	S_6
S_8	·002	·000	·001	·001	·002	·001	S_8
M_1	·046	·031	·008	·011	·069	·053	M_1
M_2	2·564	2·586	2·559	2·554	2·580	2·615	M_2
M_3	0·047	0·053	0·050	0·044	0·035	0·027	M_3
M_4	·037	·032	·033	·033	·038	·034	M_4
M_6	·044	·048	·046	·046	·043	·050	M_6
M_8	·003	·006	·002	·001	·006	·008	M_8
O	·671	·671	·663	·657	·658	·655	O
K_1	1·310	1·307	1·298	1·302	1·311	1·317	K_1
K_2	0·262	0·297	0·296	0·258	0·277	0·281	K_2
P	·382	·377	·387	·402	·371	·373	P
J	·084	·101	·079	·057	·100	·119	J
Q	·148	·151	·122	·130	·147	·132	Q
L	·072	·086	·084	·088	·089	·141	L
N	·613	·618	·598	·613	·622	·593	N
λ	...	...	...	...	...	...	λ
ν	·171	·030	·115	·207	·206	·097	ν
μ	·045	·070	·045	·078	·060	·075	μ
R	...	...	...	...	...	...	R
T	·036	·117	·133	·048	·053	·108	T
MS	·026	·037	·040	·048	·033	·042	MS
2SM	·025	·016	·020	·026	·024	·014	2SM
2N	·075	·108	·066	·109	·098	·091	2N
M_2N	·081	·067	·069	·099	·070	·069	M_2N
M_2K_1	·066	·065	·008	·046	·065	·053	M_2K_1
$2M_2K_1$	·015	·005	·011	·023	·027	·027	$2M_2K_1$
Mm	·016	.071	·014	·060	·073	·058	Mm
Mf	·052	·050	·008	·039	·012	·004	Mf
MSf	·004	·050	·012	·029	·023	·045	MSf
Sa	·182	·092	·090	·087	·171	·070	Sa
Ssa	·253	·198	·169	·177	·227	·086	Ssa

Values of κ's at Kurrachee.

Tide	κ						Tide
	1868-69	1869-70	1870-71	1871-72	1872-73	1873-74	
	°	°	°	°	°	°	
S_1	176·57	187·50	162·29	158·20	147·41	155·03	S_1
S_2	322·72	323·68	323·68	321·94	321·56	321·19	S_2
S_4	...	...	355·95	4·54	0·00	325·52	S_4
S_6	...	...	...	292·99	295·25	311·99	S_6
S_8	...	...	...	...	...	26·57	S_8
M_1	336·25	...	77·76	23·09	358·57	46·26	M_1
M_2	294·47	295·45	294·54	293·53	293·72	292·81	M_2
M_3	333·22	333·41	322·35	332·35	316·24	330·32	M_3
M_4	44·42	26·83	27·55	22·85	28·31	9·22	M_4
M_6	221·99	209·79	218·32	203·18	214·07	208·47	M_6
M_8	...	...	...	248·86	265·73	154·66	M_8
O	47·02	50·26	47·92	47·36	45·81	46·31	O
K_1	46·69	46·64	48·00	46·43	45·96	45·70	K_1
K_2	328·73	315·01	313·32	320·63	321·08	314·74	K_2
P	46·35	50·27	44·97	47·91	47·44	48·07	P
J	79·12	63·77	38·35	61·14	82·18	157·26	J
Q	46·38	60·66	54·00	50·27	52·23	62·53	Q
L	297·67	321·21	293·55	356·38	263·34	283·63	L
N	279·00	281·04	279·27	279·83	274·85	278·17	N
λ	335·15	269·77	208·63	207·27	12·06	259·48	λ
ν	254·32	222·61	343·12	283·85	300·09	237·76	ν
μ	267·37	224·14	300·38	254·23	269·96	232·48	μ
R	...	271·34	...	220·50	...	228·02	R
T	...	319·66	...	22·44	...	232·65	T
MS	215·48	179·51	324·47	357·92	...	307·14	MS
2SM	...	...	...	...	...	128·47	2SM
2N	...	...	...	...	...	...	2N
M_2N	...	...	...	...	...	...	M_2N
M_2K_1	...	...	...	...	...	...	M_2K_1
$2M_2K_1$	...	...	...	...	...	...	$2M_2K_1$
Mm	247·73	175·27	115·90	...	...	55·83	Mm
Mf	317·79	311·48	259·25	...	...	222·95	Mf
MSf	327·50	18·77	158·70	...	...	44·13	MSf
Sa	43·96	80·20	107·11	...	...	95·38	Sa
Ssa	81·98	116·93	69·69	...	...	162·45	Ssa

Values of κ's at Kurrachee—(Continued).

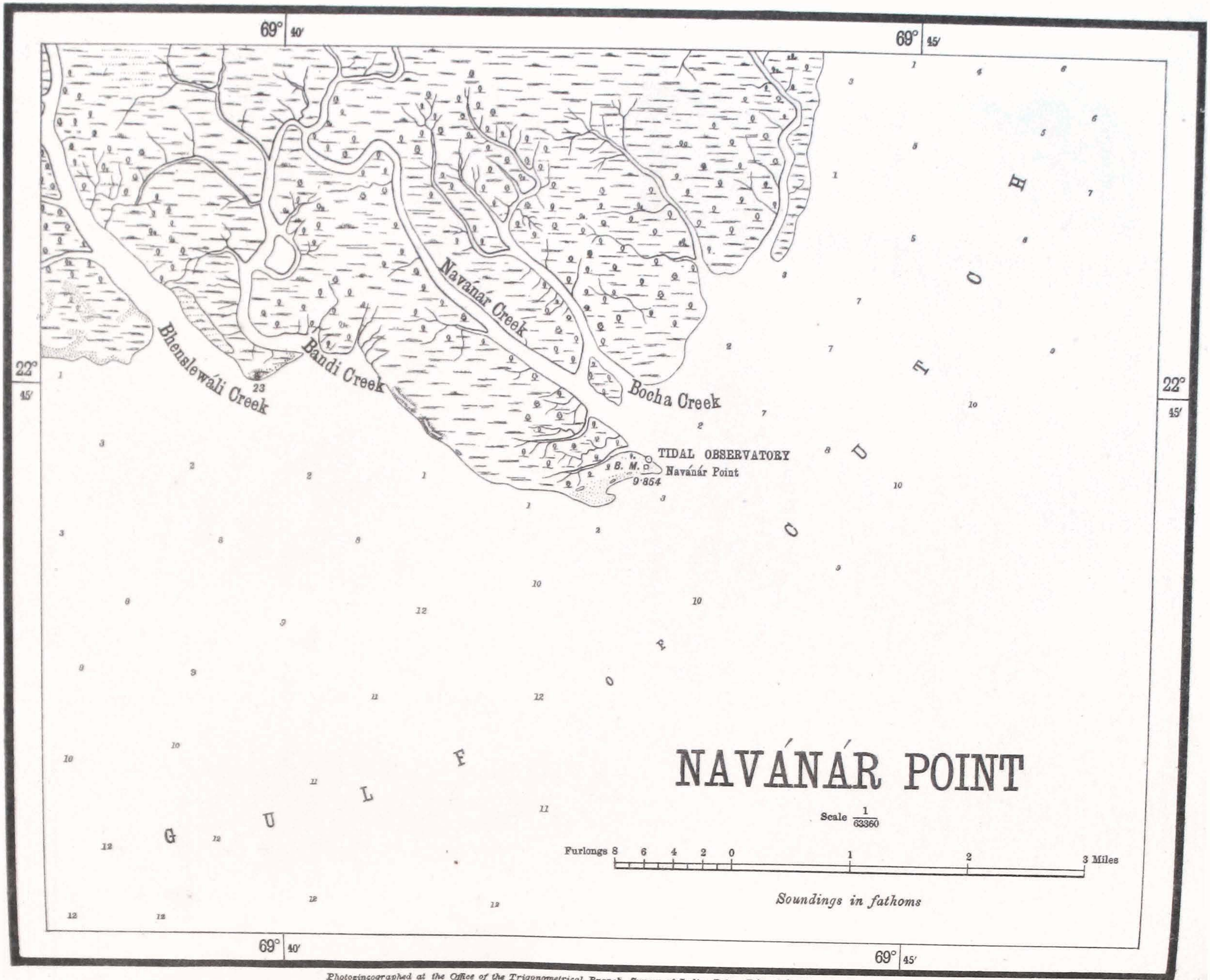
Tide	κ						Tide
	1874-75	1875-76	1876-77	1877-78	1878-79	1879-80	
	°	°	°	°	°	°	
S_1	152·50	150·45	156·98	180·85	166·94	161·33	S_1
S_2	319·93	319·94	318·09	321·14	324·14	324·73	S_2
S_4	6·42	353·25	17·21	23·43	29·43	63·09	S_4
S_6	308·53	294·60	259·05	274·57	291·09	324·69	S_6
S_8	265·60	282·53	206·57	254·06	126·03	222·71	S_8
M_1	66·43	36·34	352·53	76·40	54·36	13·99	M_1
M_2	291·84	291·40	290·71	291·43	296·46	296·28	M_2
M_3	335·89	345·09	343·10	326·90	328·21	319·81	M_3
M_4	7·52	14·75	353·07	15·90	1·95	6·89	M_4
M_6	211·60	206·24	206·60	196·31	214·75	219·74	M_6
M_8	196·09	297·25	281·05	252·46	268·79	19·94	M_8
O	45·62	45·97	45·15	45·96	49·06	47·33	O
K_1	45·65	45·87	44·48	44·53	47·68	47·51	K_1
K_2	315·77	320·63	317·70	313·88	329·47	324·55	K_2
P	45·97	44·92	48·97	42·92	44·34	45·06	P
J	35·05	50·12	70·76	87·96	65·97	63·58	J
Q	58·43	46·07	35·38	47·71	46·90	49·69	Q
L	280·33	302·39	306·33	305·37	263·47	311·92	L
N	276·43	274·01	272·97	272·58	274·27	280·14	N
λ	181·15	94·54	300·20	236·05	184·12	35·42	λ
ν	320·04	316·72	284·94	235·59	210·82	331·94	ν
μ	274·00	259·66	279·54	216·90	297·04	249·22	μ
R	...	...	307·84	...	273·16	...	R
T	...	...	343·81	...	315·48	...	T
MS	303·72	314·50	313·45	325·81	351·00	337·48	MS
2SM	149·76	97·57	114·71	63·10	167·00	157·65	2SM
2N	...	...	...	...	...	...	2N
M_2N	...	...	...	...	...	...	M_2N
M_2K_1	...	...	...	...	...	...	M_2K_1
$2M_2K_1$	...	...	...	...	...	...	$2M_2K_1$
Mm	23·66	103·22	42·11	49·03	...	25·61	Mm
Mf	40·58	23·74	0·50	29·74	...	327·75	Mf
MSf	333·25	185·68	194·77	313·68	...	318·14	MSf
Sa	56·27	75·77	79·89	119·62	...	86·49	Sa
Ssa	156·65	167·27	163·75	69·72	...	170·97	Ssa

Values of κ's at Kurrachee—(Continued).

Tide	κ						Tide
	1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	
	°	°	°	°	°	°	
S_1	63·64	173·64	171·86	171·24	182·90	173·62	S_1
S_2	323·55	324·03	323·86	323·70	323·13	322·33	S_2
S_4	31·43	12·10	35·22	25·26	44·23	43·43	S_4
S_6	291·63	313·98	287·24	279·90	323·57	315·69	S_6
S_8	11·31	123·69	161·57	288·44	240·26	194·04	S_8
M_1	319·00	39·41	61·27	31·39	111·46	133·57	M_1
M_2	294·72	294·41	294·11	293·93	294·02	292·50	M_2
M_3	319·40	327·02	336·34	347·20	348·93	337·23	M_3
M_4	1·65	16·57	359·10	16·07	20·56	15·44	M_4
M_6	208·60	207·25	204·42	206·21	206·00	198·57	M_6
M_8	340·80	256·51	262·44	196·20	321·50	266·70	M_8
O	46·28	46·37	46·53	48·21	47·29	47·12	O
K_1	46·75	46·82	46·87	47·08	45·87	46·30	K_1
K_2	321·77	317·11	321·16	321·64	316·14	315·67	K_2
P	48·51	45·34	44·42	48·34	46·43	44·74	P
J	105·95	52·71	37·69	58·20	80·19	46·12	J
Q	50·81	64·36	61·22	43·15	45·76	52·58	Q
L	309·72	291·37	293·06	284·98	315·51	281·14	L
N	275·70	278·74	280·45	278·05	275·26	275·58	N
λ	312·88	275·33	235·83	281·57	290·31	240·50	λ
ν	313·57	263·53	235·76	330·92	320·14	288·47	ν
μ	282·63	267·14	269·57	276·33	287·69	272·34	μ
R	317·15	...	315·36	...	311·51	...	R
T	330·11	...	40·79	...	321·33	...	T
MS	317·49	326·99	328·16	336·17	339·26	344·68	MS
2SM	120·21	120·90	114·93	91·48	113·23	125·06	2SM
2N	...	253·77	270·86	241·12	231·44	237·53	2N
M_2N	...	34·83	79·22	50·48	41·59	31·09	M_2N
M_2K_1	...	6·30	60·52	104·92	153·72	358·44	M_2K_1
$2M_2K_1$	...	31·98	20·45	22·92	6·72	351·83	$2M_2K_1$
Mm	131·23	72·21	93·74	38·51	118·88	0·93	Mm
Mf	70·82	254·15	128·44	340·58	33·82	122·25	Mf
MSf	302·36	130·61	148·42	138·20	196·87	335·97	MSf
Sa	101·51	49·59	50·68	38·72	43·81	105·93	Sa
Ssa	191·73	163·73	193·94	170·24	160·55	150·47	Ssa

Values of κ's at Kurrachee—(Continued).

Tide	κ 1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	Tide
	°	°	°	°	°	°	
S_1	179·18	177·18	180·15	180·66	165·17	164·11	S_1
S_2	322·84	322·98	323·07	323·61	324·44	323·90	S_2
S_4	26·25	38·66	22·74	24·96	42·94	27·93	S_4
S_6	284·04	308·81	288·69	308·05	302·99	287·99	S_6
S_8	82·24	75·96	104·04	341·57	25·02	82·88	S_8
M_1	95·29	12·93	68·57	35·01	55·96	26·18	M_1
M_2	293·17	293·77	294·48	293·93	293·91	293·44	M_2
M_3	333·25	326·84	323·20	319·19	323·27	332·17	M_3
M_4	348·20	358·17	349·45	1·99	354·95	347·53	M_4
M_6	199·44	203·11	201·31	197·91	202·93	201·15	M_6
M_8	198·47	229·19	205·49	35·10	222·97	262·92	M_8
O	45·64	45·90	46·01	45·67	45·53	46·32	O
K_1	46·40	46·44	46·45	46·62	46·09	45·74	K_1
K_2	324·55	320·13	316·59	319·77	325·14	319·58	K_2
P	44·97	46·92	47·22	46·41	46·18	47·58	P
J	42·13	63·90	92·35	63·23	45·10	63·66	J
Q	49·26	42·07	46·16	55·48	53·85	47·42	Q
L	314·99	284·30	310·71	287·77	308·40	268·23	L
N	278·42	278·34	279·32	278·20	279·68	279·51	N
λ	...	...	...	...	...	...	λ
ν	246·06	222·02	339·50	301·99	262·91	225·47	ν
μ	257·33	271·80	277·58	281·84	262·11	273·21	μ
R	...	...	...	...	...	...	R
T	47·64	357·93	312·06	274·06	45·01	347·76	T
MS	340·82	342·43	320·80	333·47	344·42	325·95	MS
2SM	108·62	85·07	122·00	125·50	111·22	114·04	2SM
2N	266·87	244·78	228·54	233·22	271·11	244·01	2N
M_2N	97·88	61·89	64·42	48·61	116·72	77·72	M_2N
M_2K_1	59·94	96·28	91·52	21·96	58·11	93·42	M_2K_1
$2M_2K_1$	344·02	82·29	47·26	46·52	37·70	23·86	$2M_2K_1$
Mm	291·35	104·80	221·71	286·36	268·21	346·87	Mm
Mf	30·57	298·93	72·28	335·16	20·06	73·51	Mf
MSf	170·84	51·84	316·26	214·57	39·54	61·80	MSf
Sa	80·84	26·86	58·97	55·84	82·76	41·05	Sa
Ssa	142·18	173·42	126·95	169·76	164·25	125·25	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, August 1899.

Regr. No. D. 156, S. I. D. - July 99—500

NAVÁNÁR POINT.

(Tidal Observatory, Lat. 22° 44′ N., Long. 69° 43′ E.)

The temporary tidal observatory at Navánár Point on the northern shore of the Gulf of Cutch was set up with a view to determine the existing relations between the level of the land and the sea in this locality. It was situated seven miles south of the town of Mundra, and about half a mile south of the mouth of the Navánár Creek, at the east end of the spit of sand which projects beyond the Point, in the position shown on the accompanying chart. The observatory, masonry well, float-cylinder and communication pipe were very similar to those at Okha Point described on page 23.

The working scale of the tide-gauge was one-sixth.

Registrations were commenced on the 1st May, 1874, and were discontinued on the 5th May, 1875. They were not very successful, owing to the continual alteration in the configuration of the fore-shore, which caused a gap in the observations from the 14th June, 1874, to the 7th March, 1875, and thus reduced the period of the observations available for computation to three and a half lunations. From these observations some of the short period tides have been calculated, and a value of mean-sea-level has been obtained.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory, and the anemometer on the top of the same building.

The bench-mark of reference is a stone marked G.T.S. □ B.M. C. embedded in a three-foot cube of masonry about six inches below the surface of the ground, and situated on a spit of sand to the W. of the creek and about twenty chains S.W. of the light-house. It is nine hundred and eighteen yards from the still-standing cylinder of the tidal observatory, and its bearing from the cylinder is 254°. It is 25·372 feet above the zero of the gauge. Bench-marks A and B, which were placed nearer to the observatory than the above, and in the same line of bearing from it, have disappeared.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = XII^h 47^m.

The highest high water recorded was 24·6 feet above the zero of the gauge, and occurred in June, 1874.

The lowest low water recorded was 4·7 feet above the zero of the gauge, and occurred in May, 1874.

In 1874-75 the mean range of largest ordinary springs was found to be 17·6 feet.

The height of mean-sea-level above the zero of the gauge had the following value:—

1874-75 ... ... 15·441 feet.

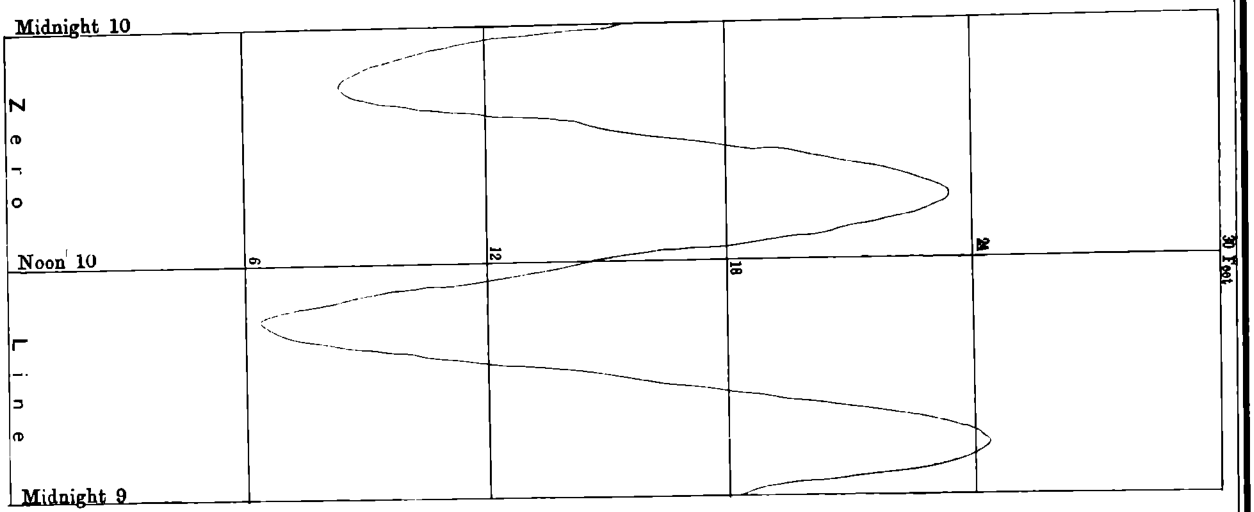
NOTE.—The bench-marks of reference at Navánár, Hansthal, and Okha Points were connected by spirit-levelling, and at the time of the establishment of the observatories at these stations, the intention was that a second and final series of tidal observations should be taken at each of them after a sufficient interval had elapsed for a sensible change to have taken place in the relative levels of land and sea.

Values of H's *and* κ's *at Navánár Point.*

Tide	H	κ	Tide	H	κ
	1874-75	1874-75		1874-75	1874-75
	Feet	°		Feet	°
S_1	...	...	N	1·263	10·77
S_2	1·893	55·33	λ	0·152	70·15
S_4	0·013	359·56	ν	·308	4·48
S_6	...	...	μ	·431	184·55
S_8	...	...	R	...	...
M_1	...	...	T	...	...
M_2	6·044	24·37	MS	...	...
M_3	...	...	2SM	...	...
M_4	0·109	273·11	2N	...	...
M_6	·065	41·47	M_2N	...	...
M_8	·023	338·86	M_2K_1	...	...
O	·684	65·87	$2M_2K_1$	...	...
K_1	1·528	62·61	Mm	...	...
K_2	0·372	62·95	Mf	...	...
P	·281	72·02	MSf	...	...
J	·147	97·00	Sa	...	...
Q	·146	68·97	Ssa	...	...
L	·505	24·81			

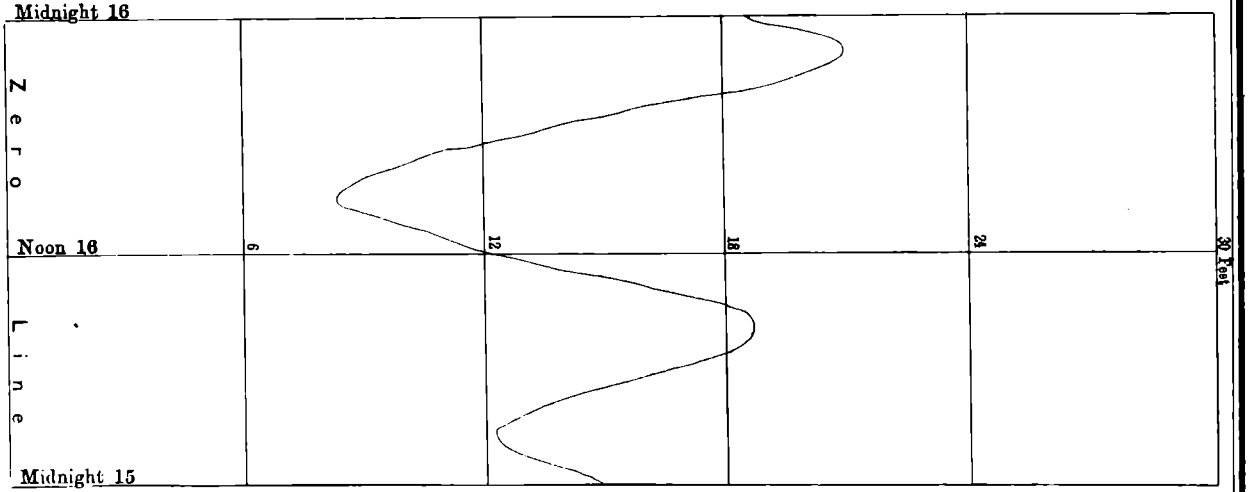
TIDAL CURVES
at
NAVÁNÁR POINT

Spring Tide — 10th March 1875



New Moon — 7th March 1875

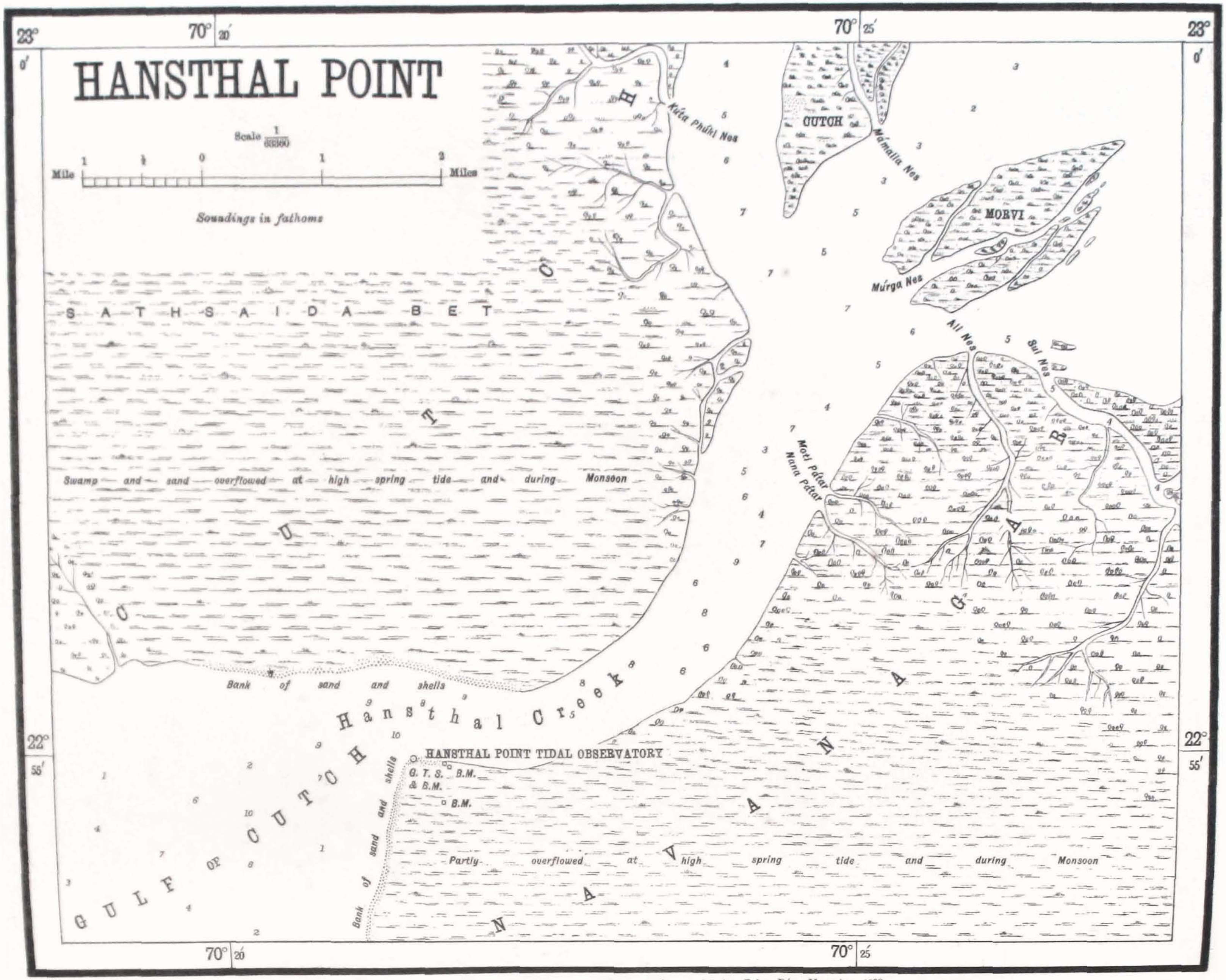
Neap Tide — 16th March 1875



First Quarter — 14th March 1875

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. October 1900.

Regr. No. D. 724, S. I. D. - May 1900-500



Regr. No. D. 741, S. I. D. - Nov. 98-500 Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun. November 1898.

HANSTHAL POINT.

(Tidal Observatory, Lat. 22° 56′ N., Long. 70° 21′ E.)

The temporary tidal observatory at Hansthal Point, at the head of the Gulf of Cutch, was erected with a view to determine the existing relations between the level of the land and the sea in this locality. It was not considered necessary to continue the first series of tidal observations for more than thirteen and a half months, after which period the observatory was dismantled. The observatory was situated fifteen miles north of the town of Jodiya, on the Káthiáwár or left bank of the Hansthal Creek, about a quarter of a mile above its mouth and one hundred and eighty feet from the bank, in the position shown on the accompanying chart. The observatory, float-cylinder, and communication pipe, were very similar to those at Okha Point described on page 23; but, owing to the ground being black soil, a masonry well was dispensed with and the cylinder was sunk in an excavation of considerable diameter and twenty-five and a half feet deep.

The working scale of the tide-gauge was one-sixth.

Registrations were commenced in April, 1874, and went on very satisfactorily until May, 1875, when they were discontinued and the observatory dismantled.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory, and the anemometer on the top of the same building.

The bench-mark of reference is a stone marked G.T.S. B.□M. A. embedded in a three-foot cube of masonry, about 6 inches above the surface of the ground. It is situated eight feet E. of a specially built pillar; it is also one hundred and eighty feet W. of the still-standing cylinder of the tidal observatory, and quarter of a mile N.N.E. of a flag-staff called Mustasa Pir-ka-Báota. It is 26·034 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = I^{h} 40^{m}.

The highest high water recorded was 25·9 feet above the zero of the gauge, and occurred in July, 1874.

The lowest low water recorded was 4·3 feet above the zero of the gauge, and occurred in December, 1874.

In 1874-75 the mean range of largest ordinary springs was found to be 19·3 feet.

The height of mean-sea-level above the zero of the gauge had the following value:—

1874-75 ... ... 16·332 feet.

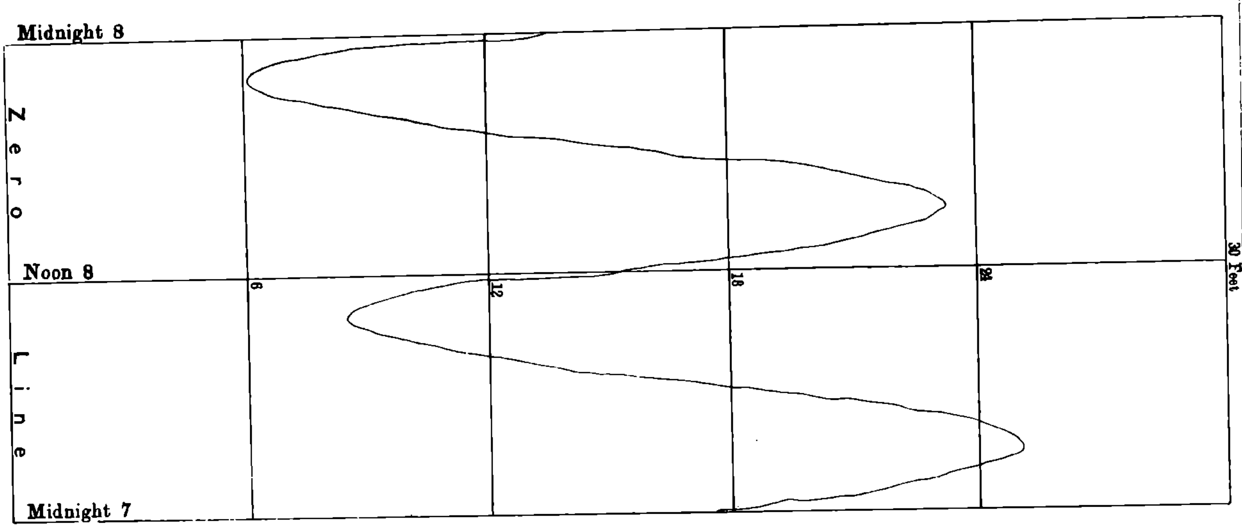
NOTE.—The bench-marks of reference at Hansthal, Okha, and Navánár Points were connected by spirit-levelling, and at the time of the establishment of the observatories at these stations, the intention was that a second and final series of tidal observations should be taken at each of them after a sufficient interval had elapsed for a sensible change to have taken place in the relative levels of land and sea.

Values of H's *and* κ's *at Hansthal Point.*

TIDE	H	κ	TIDE	H	κ
	1874-75	1874-75		1874-75	1874-75
	Feet	°		Feet	°
S_1	0·129	164·01	N	1·193	25·79
S_2	1·928	84·51	λ	0·235	38·60
S_4	0·021	61·74	ν	·296	47·27
S_6	·007	166·57	μ	·595	177·80
S_8	·003	158·63	R	...	...
M_1	·055	77·75	T	...	...
M_2	6·854	45·55	MS	·351	12·04
M_3	0·056	92·09	2SM	·135	298·71
M_4	·727	329·61	2N	...	...
M_6	·305	246·02	M_2N	...	...
M_8	·083	150·47	M_2K_1	...	...
O	·754	74·70	$2M_2K_1$	...	...
K_1	1·495	81·11	Mm	·121	14·17
K_2	0·527	81·25	Mf	·101	36·88
P	·384	83·65	MSf	·169	12·73
J	·095	127·70	Sa	·024	195·32
Q	·139	77·17	Ssa	·090	156·38
L	·570	36·77			

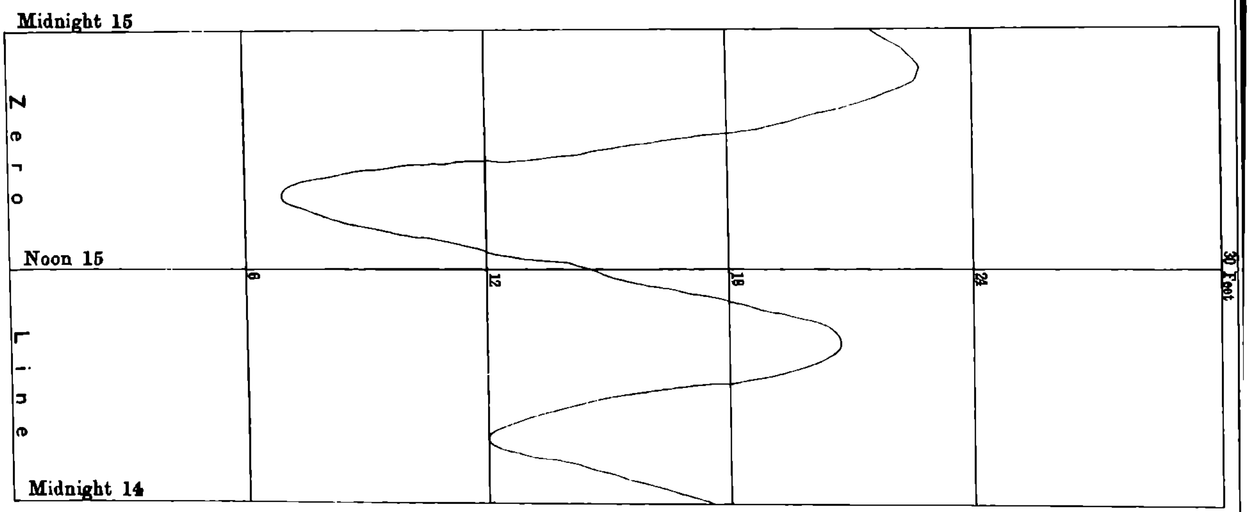
TIDAL CURVES
at
HANSTHAL POINT

Spring Tide ___ 8th February 1875



New Moon ___ 6th February 1875

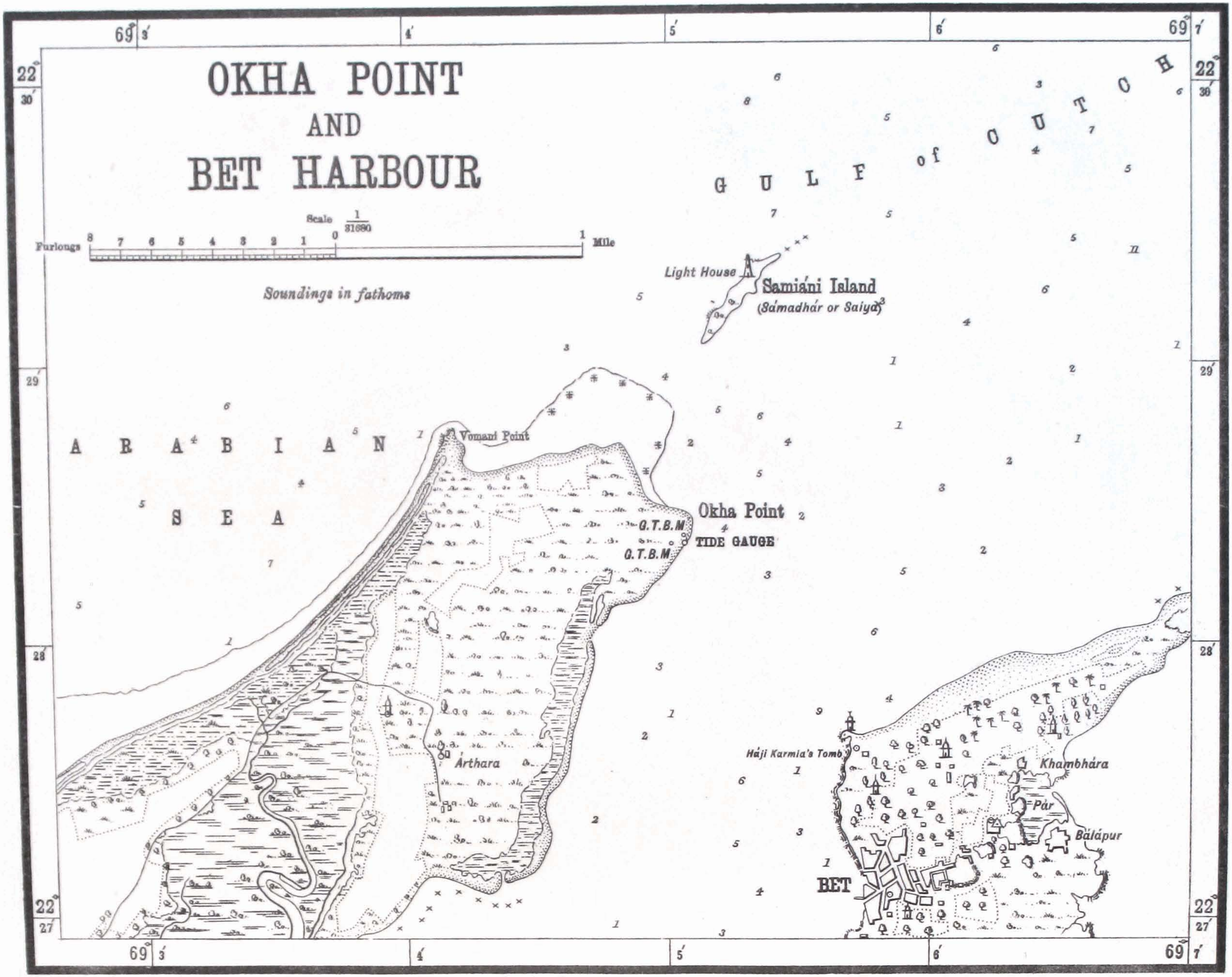
Neap Tide ___ 15th February 1875



First Quarter ___ 13th February 1875

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. October 1900.

Regd. No. D 750, S. I. D.-June 1900 600



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, June 1893.

OKHA POINT AND BET HARBOUR.

(*Tidal Observatory, Lat. 22° 28′ N., Long. 69° 5′ E.*)

The temporary tidal observatory at Okha Point, on the promontory at the south side of the entrance to the Gulf of Cutch, was erected primarily with a view to determine the existing relations between the level of the land and the sea in this locality. It was consequently not considered necessary to continue the first series of tidal observations at Okha for more than sixteen and a half months, after which period a convenient occasion for dismantling the observatory occurred. The observatory was situated on the shore of the Okhámandal mainland, almost exactly opposite the town and island of Bet, and about three hundred yards south of the north-eastern corner of the land, in the position shown on the accompanying chart. The observatory was a wooden cabin constructed so as to be easily taken to pieces, fixed on three cross beams fitted on the tops of six large piles embedded eight feet in the sand. A brick masonry well, four feet in diameter, to hold the cylinder, was sunk to a depth of five or six feet below low-water springs, and twenty-five feet below the ground level. The float-cylinder was of wrought iron, about twenty-nine feet long and twenty-two inches internal diameter, and rested on the bottom of the well. Nine inches from the bottom of the cylinder a two-inch iron pipe was taken up vertically to within twelve feet six inches of the top of the cylinder: here a stop-cock was placed on a bend, whence the two-inch pipe, having a slight inclination downwards, was carried out to a total length of a hundred and seventy-five feet until it met the natural surface of the sand nearly thirty feet beyond low-water mark. Here a flexible two-inch tube was connected with the iron pipe, and a rose at the end of the tube was held in position by an anchor and sustained by buoys at about six feet from the bottom in a place where there was twenty feet of water at low springs.

The working scale of the tide-gauge was one-fourth.

Registrations were commenced in December, 1873, and went on most satisfactorily until their termination. There were very few breaks in the continuity of the observations and such as occurred were short and of no importance. The observatory was dismantled in May, 1875.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory, and the anemometer on the top of the same building.

The bench-mark of reference is a stone marked G.T.S. □ B.M. A. embedded in a three-foot cube of masonry, about six inches below the surface of the ground. It is situated one hundred feet from the still-standing cylinder of the tidal observatory, and its bearing from the cylinder is 11°. It is 20·074 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = XII^h 8^m.

The highest high water recorded was 16·4 feet above the zero of the gauge, and occurred in June, 1874.

The lowest low water recorded was 1·5 feet above the zero of the gauge, and occurred in November, 1874.

In 1874-75 the mean range of largest ordinary springs was found to be 12·4 feet.

The height of mean-sea-level above the zero of the gauge had the following value:—

1874-75 ... ... 9·650 feet.

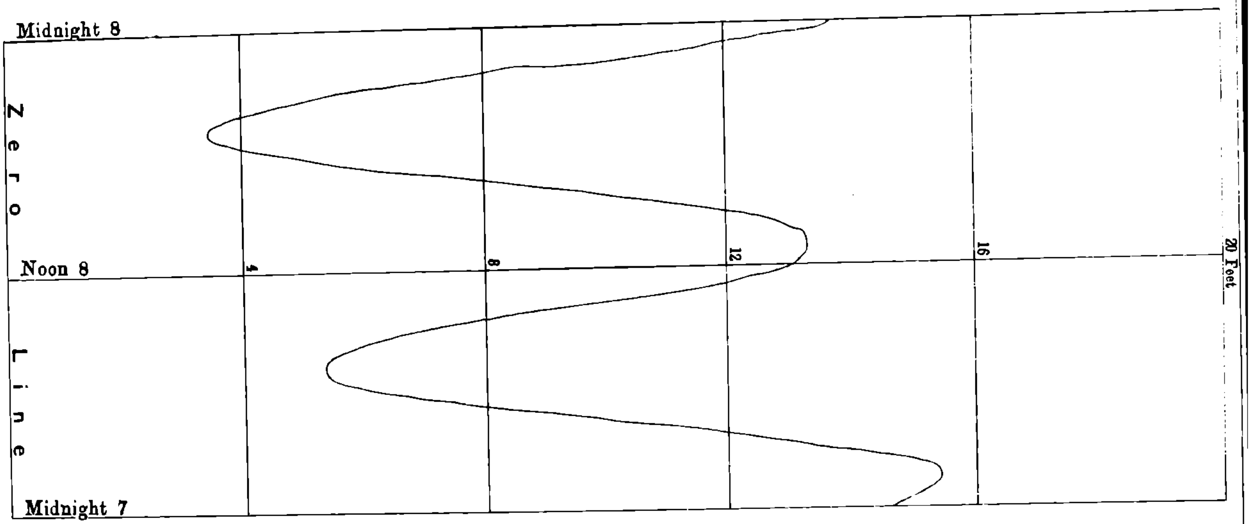
NOTE.—The bench-marks of reference at Okha, Navánár, and Hansthal Points were connected by spirit-levelling and at the time of the establishment of the observatories at these stations, the intention was that a second and final series of tidal observations should be taken at each of them after a sufficient interval had elapsed for a sensible change to have taken place in the relative levels of land and sea.

Values of H's *and* κ's *at Okha Point.*

TIDE	H	κ	TIDE	H	κ
	1874-75	1874-75		1874-75	1874-75
	Feet	°		Feet	°
S_1	0·074	149·89	N	0·781	321·97
S_2	1·222	14·37	λ	·073	23·43
S_4	0·013	116·57	ν	·164	7·53
S_6	·003	20·92	μ	·203	182·32
S_8	·001	219·81	R	...	...
M_1	·051	43·00	T	...	...
M_2	3·820	347·11	MS	·064	111·40
M_3	0·030	20·64	2SM	·044	292·21
M_4	·136	106·94	2N	...	...
M_6	·007	269·65	M_2N	...	...
M_8	·011	96·17	M_2K_1	...	...
O	·693	56·61	$2M_2K_1$	...	...
K_1	1·414	53·11	Mm	·066	311·38
K_2	0·328	17·44	Mf	·050	43·87
P	·384	49·94	MSf	·141	250·16
J	·107	81·41	Sa	·162	3·11
Q	·137	58·62	Ssa	·121	144·75
L	·221	23·22			

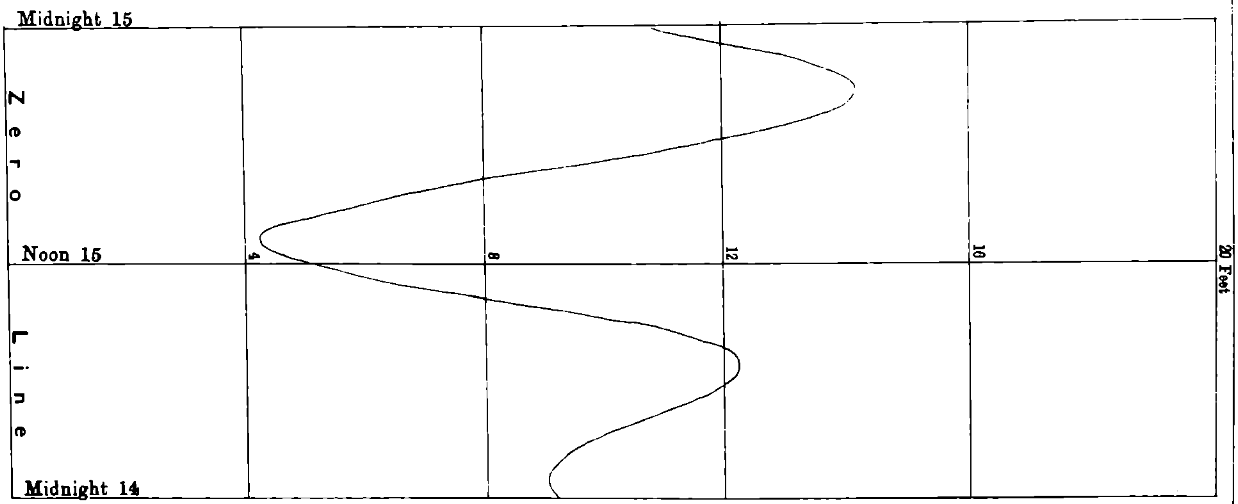
TIDAL CURVES
at
OKHA POINT & BET HARBOUR

Spring Tide — 8th February 1875



New Moon — 6th February 1875

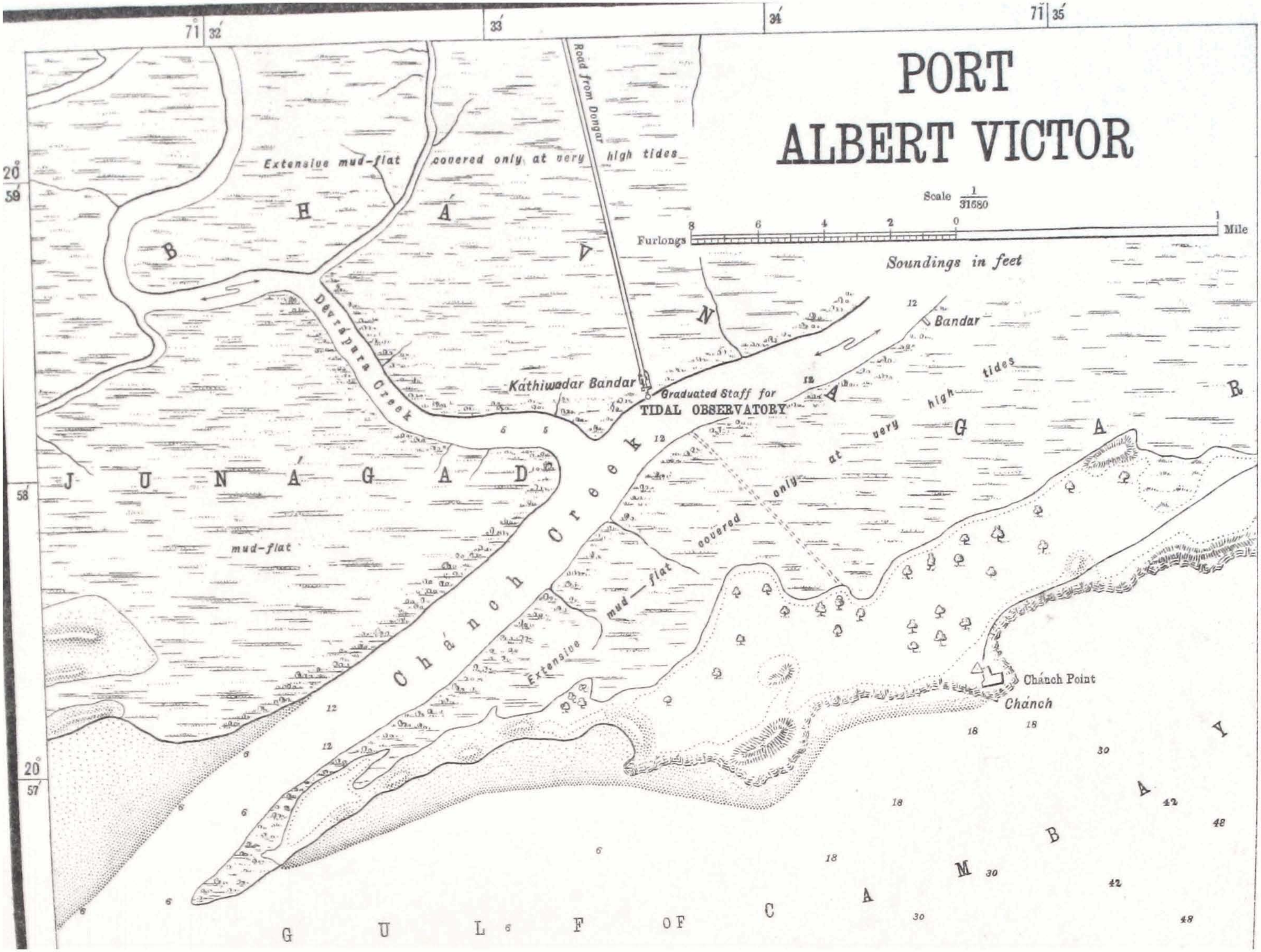
Neap Tide — 15th February 1875



First Quarter — 13th February 1875

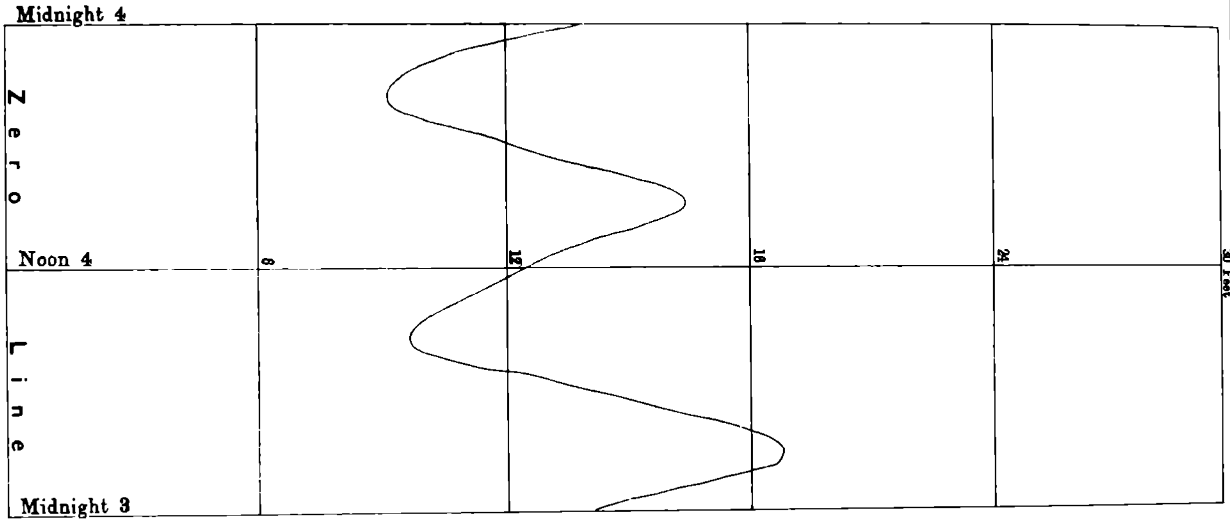
Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. July 1899.

Regr. No. D. 116. S. I. D. - May 99 - 500


PORT
ALBERT VICTOR
Scale 1/31680
Furlongs 8 6 4 2 0 1 Mile
Soundings in feet
Road from Dongar
Extensive mud-flat covered only at very high tides
BHÁVNAGAR
JUNÁGADH
Dévrápura Creek
Kathiwadar Bandar
Graduated Staff for TIDAL OBSERVATORY
Bandar
Chánch Creek
Extensive mud-flat covered only at very high tides
mud-flat
Chánch Point
Chánch
GULF OF CAMBAY
71° 32′
33′
34′
71° 35′
20° 59′
58′
20° 57′

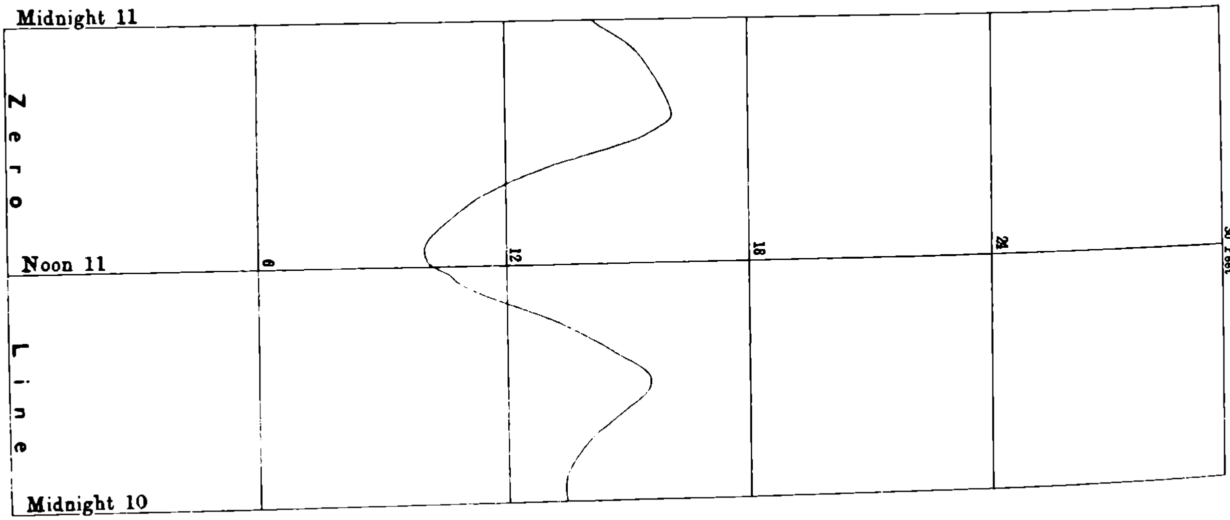
TIDAL CURVES
at
PORT ALBERT VICTOR

Spring Tide ___ 4th February 1882



Full Moon ___ 3rd February 1882

Neap Tide ___ 11th February 1882



Last Quarter ___ 11th February 1882

Photozincographed at the Office of the Trigonometrical Branch, Survey of India. Dehra Dún, July 1899.

Regd No. D. 117, S. I. D. - May 99 -500

PORT ALBERT VICTOR.

(*Tidal Observatory, Lat. 20° 58′ N., Long. 71° 33′ E.*)

Tidal observations at Port Albert Victor (Káthiwadar), on the south coast of Káthiáwár, were taken by means of a graduated staff during the preparations for and erection of a tidal observatory at Bhávnagar in Káthiáwár. The graduated staff was fixed in the Chánch Creek at Káthiwadar just off the new Bandar wall, in the position shown on the accompanying chart; and this staff was observed to, personally, every quarter of an hour, night and day, from 1st November, 1881, to 9th November, 1882, under the direction of the Engineer to H. H. the Maharajah of Bhávnagar.

The bench-mark of reference is on the Bandar, 85 feet from the face wall. It is 24·540 feet above the zero of the graduated staff.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $II^h\ 2^m$.

The highest high water recorded was 22·5 feet above the zero of the graduated staff, and occurred in January, 1882.

The lowest low water recorded was 5·7 feet above the zero of the graduated staff, and occurred in March, 1882.

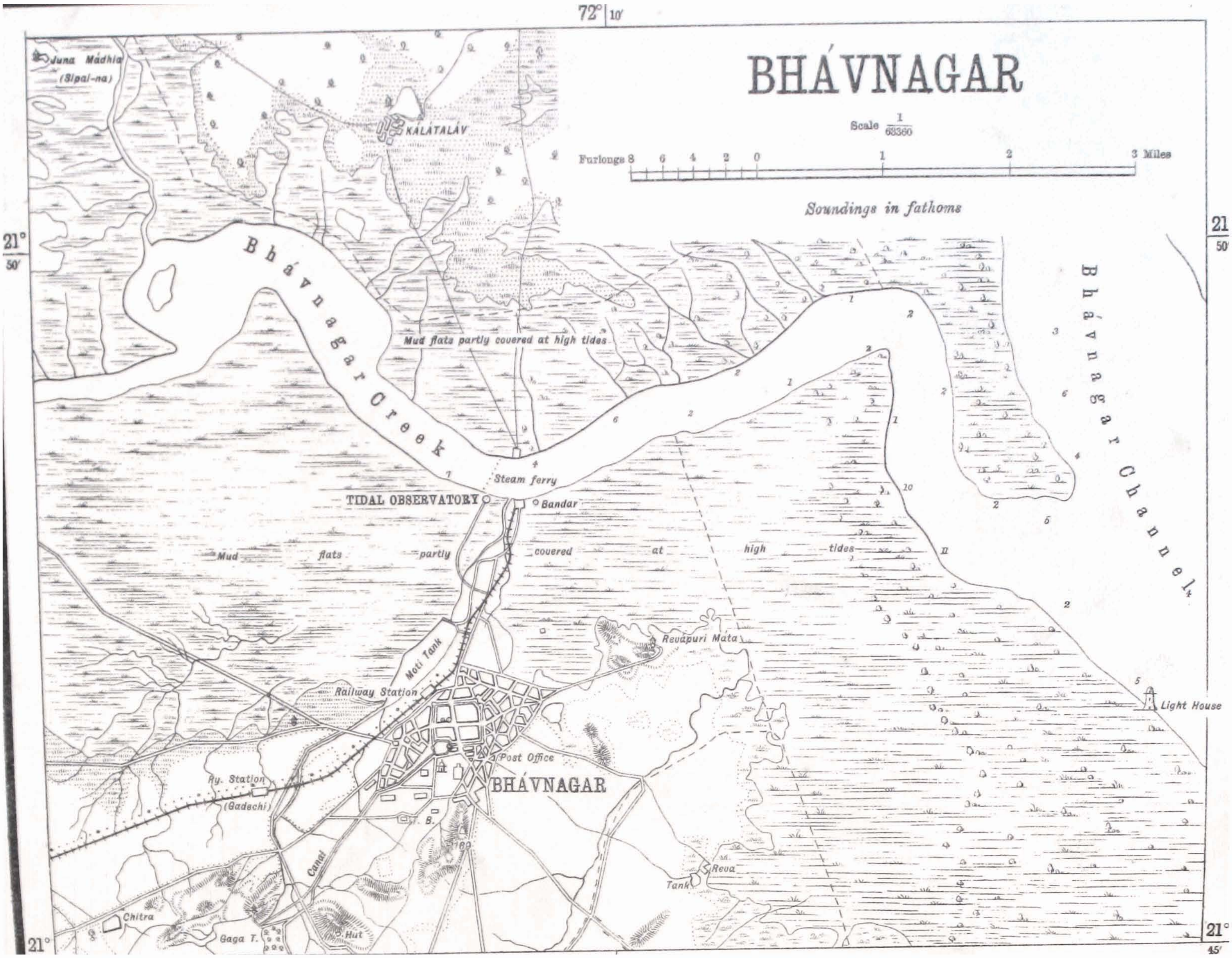
In 1881-82 the mean range of largest ordinary springs was found to be 11·9 feet.

The height of mean-sea-level above the zero of the graduated staff had the following value :—

1881-82 ... ... 13·872 feet.

Values of H's *and* κ's *at Port Albert Victor.*

TIDE	H	κ	TIDE	H	κ
	1881-82	1881-82		1881-82	1881-82
	Feet	°		Feet	°
S_1	0·134	200·98	N	0·755	33·70
S_2	1·207	80·89	λ	·043	107·14
S_4	0·029	272·78	ν	·131	15·36
S_6	·013	41·89	μ	·286	343·27
S_8	·002	263·66	R	...	...
M_1	·057	35·46	T	...	...
M_2	2·970	55·28	MS	·159	215·39
M_3	0·020	151·87	2SM	·029	153·77
M_4	·220	178·11	2N	...	...
M_6	·139	137·46	M_2N	...	...
M_8	·002	198·64	M_2K_1	...	...
O	·720	66·42	$2M_2K_1$	...	...
K_1	1·611	65·90	Mm	·052	7·56
K_2	0·324	79·21	Mf	·027	103·41
P	·436	70·67	MSf	·040	152·79
J	·175	106·68	Sa	·236	133·36
Q	·152	67·95	Ssa	·109	155·95
L	·079	260·51			


72° 10′
BHÁVNAGAR
Scale 1/63360
Furlongs 8 6 4 2 0 1 2 3 Miles
Soundings in fathoms
Juna Mádhia
(Sipal-na)
KALÁTALÁV
Bhávnagar Creek
Mud flats partly covered at high tides
Bhávnagar Channel
Steam ferry
TIDAL OBSERVATORY
Bandar
Mud flats partly covered at high tides
Revápuri Mata
Moti Tank
Railway Station
Post Office
BHÁVNAGAR
Ry. Station
(Gadechi)
T. B.
Canal
Reva
Tank
Light House
Chitra
Gaga T.
Hut
21° 50′
21° 45′
21°

BHÁVNAGAR.

(*Tidal Observatory, Lat. 21° 48′ N., Long. 72° 9′ E.*)

The observatory at Bhávnagar in Káthiáwár is one of the minor observatories, at which five years' observations are generally considered sufficient, and is situated on the south or right bank of the Bhávnagar Creek, close to the Steam Ferry Incline, in the position shown on the accompanying chart. It is a well-constructed wooden cabin surrounded by a railed-in balcony and supported on piles. The float-cylinder was specially constructed in England and is exceptionally large, as it was originally designed to be the sole support to the observatory; but that arrangement was abandoned when the observatory came to be put up. The cylinder is sunk thirty-five feet in the mud: it is forty-two inches in diameter and forty feet long, thus giving ample range for extreme tides, between which the large difference of thirty-seven feet has been observed. The communication is by a three-inch iron pipe three hundred feet long, bent in the form of a siphon. The short branch rises vertically inside the cylinder for a length of about twenty-one and a half feet from a point, always under water, three inches above the bottom (which is closed with concrete): the pipe then passes firstly through the cylinder, then through eighty feet of mud, and then descends on supports into deep water where it terminates with a rose always under water. An air-chamber with a cock to release the air which accumulates from within the communication pipe, and a stop-cock used for flushing purposes, are placed near each other in the apex of the siphon inside the cylinder; and an iron ladder leads down to the bottom of the cylinder, so that any deposit of mud can be removed when necessary. The observatory and its equipment of instruments belong to H. H. the Maharajah of Bhávnagar, and are under the supervision of the State Engineer.

The working scale of the tide-gauge is one-tenth.

Registrations were commenced on the 1st January, 1886, and have been fairly continuous up to the present, although the periodical flushing out, inevitable leakages in the long communication pipe, and accidents to the cocks have caused numerous trifling interruptions. Up to a late date in November, 1888, the curves, though fairly continuous, presented certain peculiarities which occurred with regularity and which were attributed to idiosyncrasies of the tides in the Bhávnagar Creek. It was then found that the peculiarities were caused by unsuspected accumulations of air in the connection pipe, and that they disappeared if the air-cock was kept open for the whole time that the water was above it. This discovery necessitated the rejection of three years' observations.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference is a dressed block of stone marked G.T.S. O B.M. and fixed in the masonry close to the Steam Ferry Incline, and distant one-hundred and fifty-four yards S.W. of the observatory. It is 43·35 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $IV^{h}\ 32^{m}$.

The highest high water recorded was 40·7 feet above the zero of the gauge, and occurred in April, 1892.

The lowest low water recorded was 3·7 feet above the zero of the gauge, and occurred in October, 1891.

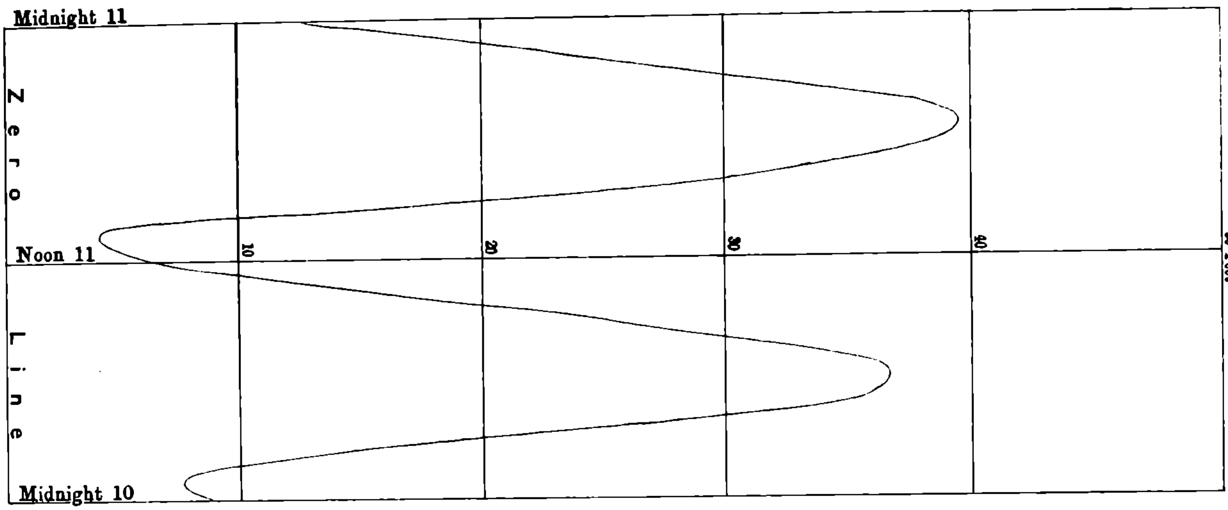
In 1890 the mean range of largest ordinary springs was found to be 31·4 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1889	22·703 feet.
1890	22·742 „
1891	22·592 „
1892	22·699 „

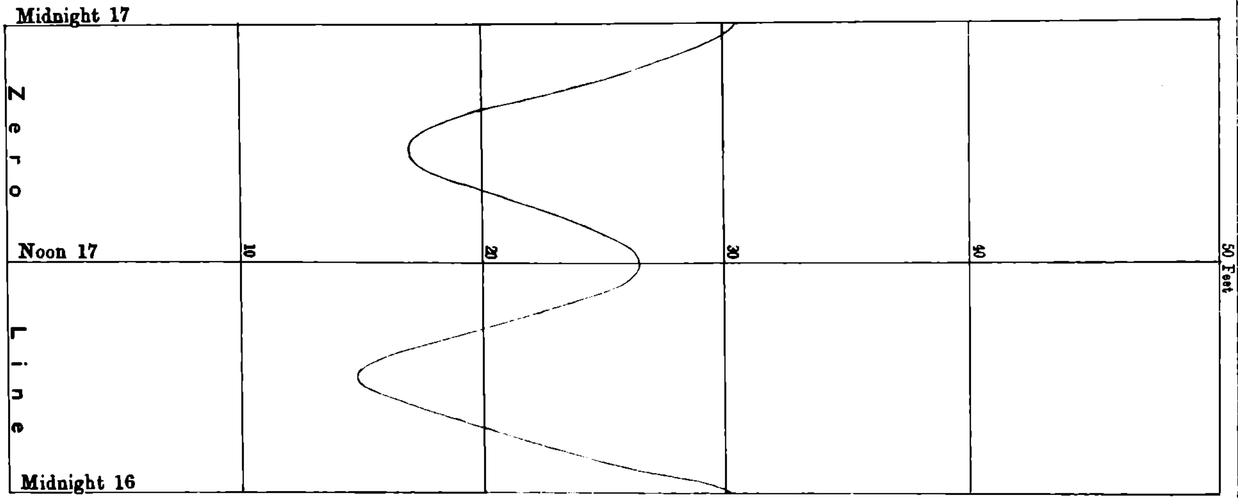
TIDAL CURVES
at
BHÁVNAGAR

Spring Tide —— 11th April 1891



New Moon —— 8th April 1891

Neap Tide —— 17th April 1891



First Quarter —— 16th April 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, June 1899.

Reg. No. D.120 S. I. D. - May 99 - 500

Values of H's *and* κ's *at Bhávnagar.*

Tide	H				κ				Tide
	1889	1890	1891	1892	1889	1890	1891	1892	
	Feet	Feet	Feet	Feet	°	°	°	°	
S_1	0·105	0·158	0·165	0·107	197·30	182·11	195·69	213·53	S_1
S_2	3·469	3·482	3·499	3·522	174·40	176·30	176·72	177·07	S_2
S_4	0·116	0·107	0·125	0·121	240·36	236·28	238·87	236·39	S_4
S_6	·016	·019	·018	·021	318·25	310·93	291·10	307·52	S_6
S_8	·004	·005	·002	·001	7·70	38·66	255·07	56·31	S_8
M_1	·059	·039	·088	·125	158·66	281·47	126·02	86·44	M_1
M_2	10·723	10·894	11·050	11·278	133·19	133·49	133·94	133·68	M_2
M_3	0·092	0·071	0·083	0·066	320·35	302·34	269·20	254·56	M_3
M_4	·842	·828	·910	·888	146·13	148·82	151·05	150·38	M_4
M_6	·240	·231	·246	·273	112·65	119·74	134·28	131·43	M_6
M_8	·034	·015	·016	·006	60·56	321·35	222·16	291·45	M_8
O	1·000	·972	·980	·974	83·08	83·31	84·11	85·37	O
K_1	2·288	2·309	2·366	2·365	89·50	90·68	90·19	90·32	K_1
K_2	0·855	0·723	0·896	0·984	165·77	172·70	177·07	170·64	K_2
P	·674	·679	·681	·688	91·73	95·67	97·93	93·37	P
J	·262	·165	·166	·214	161·49	166·89	123·66	118·24	J
Q	·210	·172	·194	·227	81·60	96·09	92·83	82·37	Q
L	·453	·593	·819	·774	138·59	152·05	144·05	119·75	L
N	2·356	2·346	2·510	2·475	113·71	113·71	112·80	116·43	N
λ	...	...	...	...	...	...	...	...	λ
ν	0·337	0·437	0·855	0·890	88·14	140·46	114·39	92·96	ν
μ	·288	·379	·243	·322	278·09	259·55	269·84	259·72	μ
R	...	...	...	...	...	...	...	...	R
T	...	·035	·370	·478	...	79·63	237·40	188·08	T
MS	·638	·639	·684	·614	193·16	192·07	196·79	198·75	MS
2SM	·099	·092	·093	·086	340·12	6·74	4·91	341·15	2SM
2N	·468	·424	·101	·270	56·65	96·98	106·46	48·05	2N
M_2N	·380	·215	·367	·183	67·97	82·13	116·99	97·17	M_2N
M_2K_1	·077	·182	·315	·270	148·03	74·86	107·17	142·72	M_2K_1
$2M_2K_1$	·158	·151	·142	·158	359·24	350·52	355·28	339·39	$2M_2K_1$
Mm	·066	·084	·101	·147	343·36	300·85	22·78	354·54	Mm
Mf	·066	·069	·078	·062	328·13	293·94	35·16	19·90	Mf
MSf	·105	·138	·176	·126	45·81	44·21	61·97	27·40	MSf
Sa	·178	·215	·268	·359	104·82	87·91	132·86	111·32	Sa
Ssa	·112	·234	·033	·131	172·06	206·65	11·63	137·56	Ssa

APOLLO BANDAR, BOMBAY.

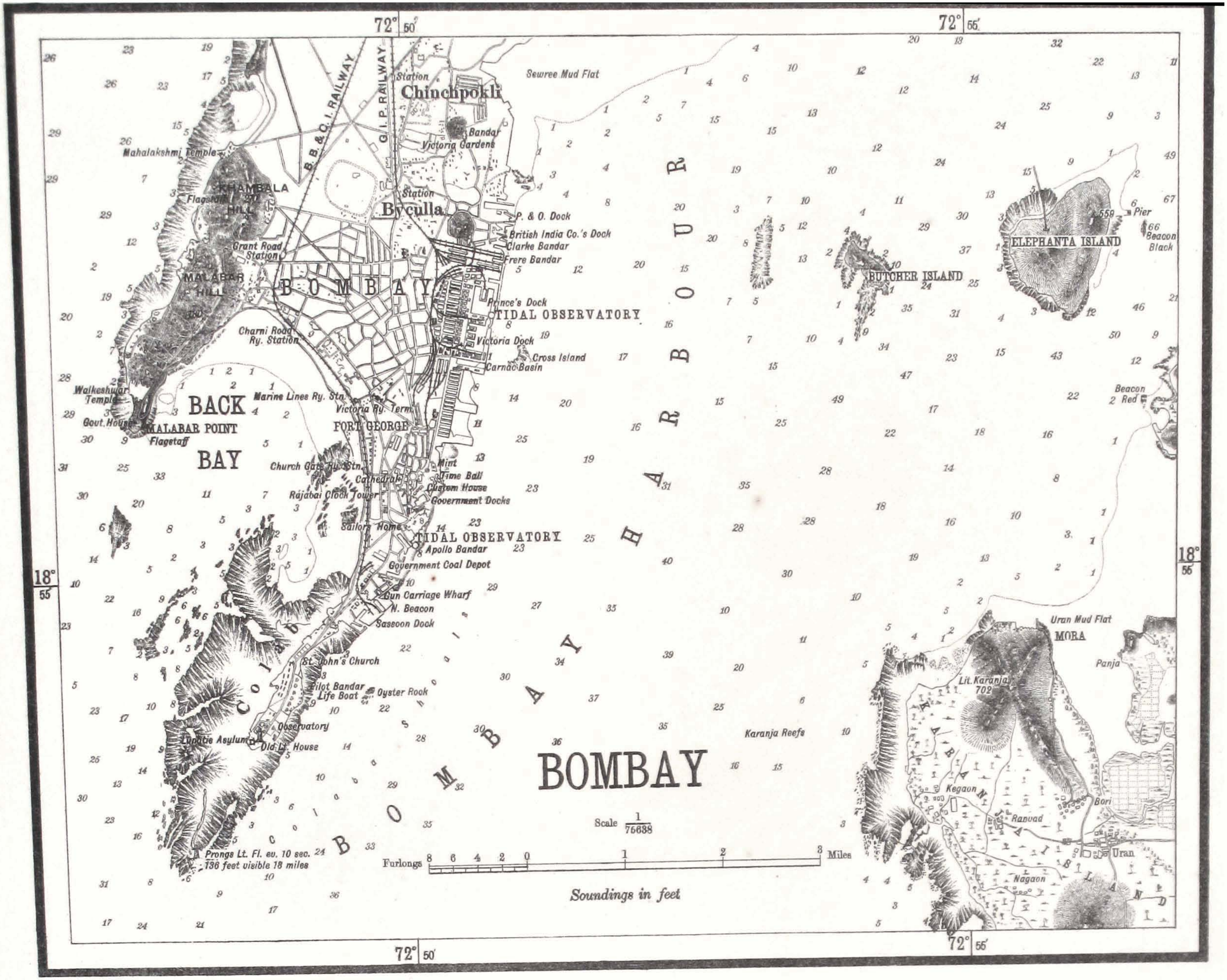
(Tidal Observatory, Lat. 18° 55′ N., Long. 72° 50′ E.)

The tidal observatory at the Apollo Bandar, Bombay, is one of the permanent observatories and is situated at the N.E. corner of the Bandar (or pier), in the position shown on the accompanying chart. It is a neat wooden building covering a well (constructed in the masonry of the Bandar), that prior to the establishment of a tidal observatory, had been used for the tidal measurements taken by the Engineer to the Port Trust. The well is twenty-six feet deep, of circular section, and of a diameter of twelve feet at and for twelve feet above the bottom, whence it narrows gradually to a diameter of eight feet at the mouth. A horizontal passage twelve inches by six inches in section and eleven feet long leads from the bottom of the well straight into the sea, at a level rather more than two feet below the lowest recorded tides. The float-cylinder is of iron, about twenty-two inches in diameter and about twenty-six feet long, which gives range for extreme tides. It is secured above to the flooring of the observatory, whence it descends into the well, and its lower end, which is open, is supported on three short iron pegs or feet fastened to a stone block at the bottom of the well.

The working scale of the tide-gauge is one-fourth.

Registrations were commenced on the 29th January, 1878, and have been remarkably satisfactory up to the present; in fact, this observatory may be held to rank first among Indian tidal observatories not only in respect of the continuity of the observations but in respect of the excellence of the results obtained from them.

The disturbances of the surface of the ocean, caused by the Krakatoa volcanic eruptions, were recorded at this tidal station by the self-registering tide-gauge on the 27th August, 1883.

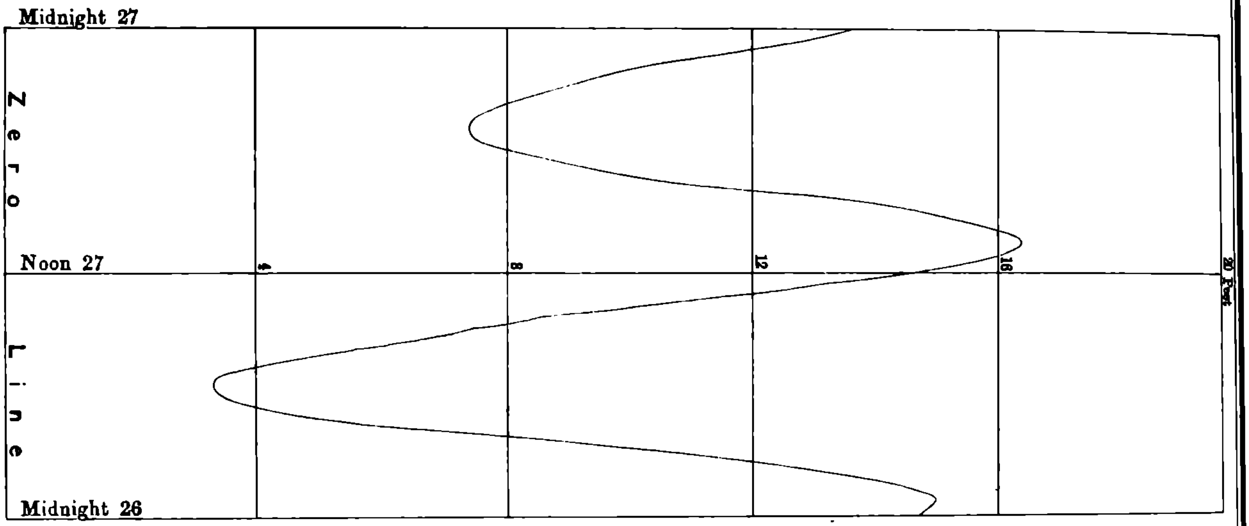


Photozincographed at the Office of the Trigonometrical Branch, Survey of India. Dehra Dún, September 1900.

Regr. No. D. 512, S.I.D.-Feby. 1900 - 500

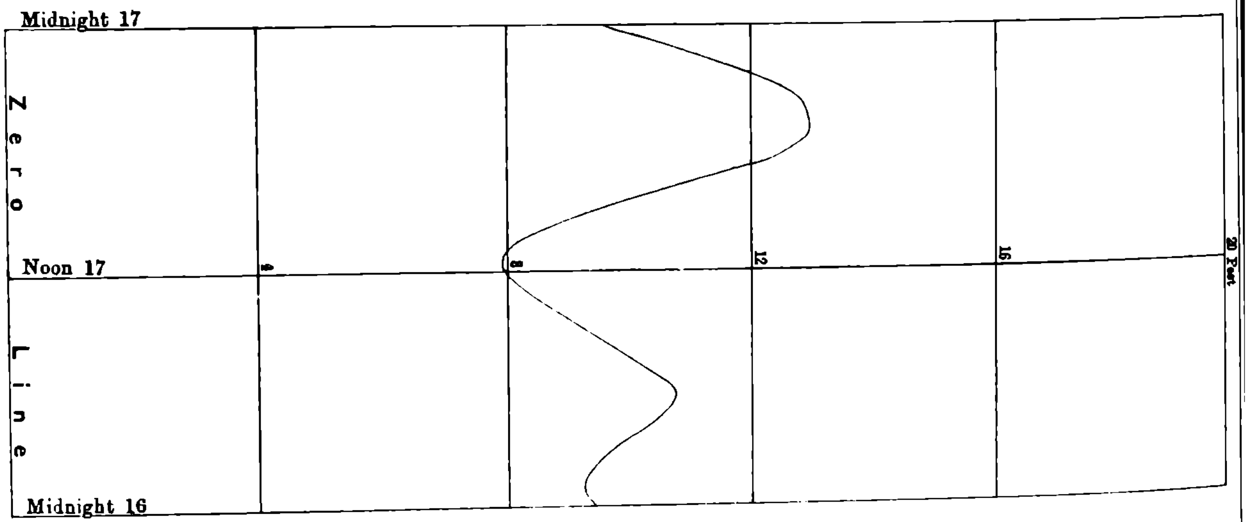
TIDAL CURVES
at
APOLLO BANDAR, BOMBAY

Spring Tide —— 27th April 1891



Full Moon —— 24th April 1891

Neap Tide —— 17th April 1891



First Quarter —— 16th April 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. June 1899.

Regd. No D 119, S. I D - May 99 - 500

Barometrical and anemometrical observations are dispensed with at this tidal observatory, as those taken at the neighbouring Meteorological Observatory at Colaba supply the necessary statistics.

The bench-mark of reference is the Standard Bench-mark, situated at the Public Works Secretariat, consisting of a three-foot cube of polished granite, the top surface of which is the plane of reference. It is 30·000 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = XI^{h} 35^{m}.

The highest high water recorded was 19·2 feet above the zero of the gauge, and occurred in July, 1881.

The lowest low water recorded was 0·6 foot above the zero of the gauge, and occurred in October, 1879.

In 1890 the mean range of largest ordinary springs was found to be 13·9 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1878	...	...	...	10·265 feet.
1879	...	...	...	10·184 ,,
1880	...	...	...	10·187 ,,
1881	...	...	...	10·248 ,,
1882	...	...	...	10·194 ,,
1883	...	...	...	10·257 ,,
1884	...	...	...	10·256 ,,
1885	...	...	...	10·304 ,,
1886	...	...	...	10·267 ,,
1887	...	...	...	10·210 ,,
1888	...	...	...	10·249 ,,
1889	...	...	...	10·209 ,,
1890	...	...	...	10·230 ,,
1891	...	...	...	10·156 ,,
1892	...	...	...	10·285 ,,

NOTE.—The level of the zero of the gauge at Apollo Bandar is 2·000 feet below that of the zero of the gauge at Prince's Dock.

Values of H's *at Apollo Bandar, Bombay.*

Tide	H								Tide
	1878	1879	1880	1881	1882	1883	1884	1885	
	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·075	0·083	0·088	0·074	0·072	0·057	0·059	0·053	S_1
S_2	1·614	1·634	1·627	1·618	1·616	1·623	1·636	1·627	S_2
S_4	0·018	0·013	0·013	0·011	0·006	0·003	0·007	0·010	S_4
S_6	·002	·004	·004	·005	·002	·004	·003	·003	S_6
S_8	·002	·002	·001	·002	·000	·001	·003	·002	S_8
M_1	·024	·036	·086	·065	·045	·067	·125	·050	M_1
M_2	3·991	4·041	4·065	4·058	4·014	4·037	4·071	4·072	M_2
M_3	0·074	0·067	0·068	0·055	0·060	0·061	0·064	0·079	M_3
M_4	·119	·129	·120	·126	·124	·134	·126	·121	M_4
M_6	·014	·015	·002	·017	·008	·012	·011	·010	M_6
M_8	·003	·004	·002	·004	·005	·007	·008	·007	M_8
O	·643	·650	·663	·647	·645	·663	·676	·682	O
K_1	1·384	1·391	1·393	1·398	1·398	1·393	1·401	1·398	K_1
K_2	0·412	0·394	0·427	0·431	0·388	0·383	0·435	0·415	K_2
P	·404	·400	·406	·403	·396	·391	·416	·415	P
J	·043	·083	·128	·122	·067	·109	·143	·099	J
Q	·122	·138	·159	·133	·101	·129	·147	·132	Q
L	·122	·054	·128	·094	·143	·032	·079	·041	L
N	1·024	1·036	·991	·974	·988	·988	·978	·995	N
λ	0·051	0·023	·030	·013	·043	·044	·017	·004	λ
ν	·288	·245	·078	·121	·261	·276	·145	·052	ν
μ	·231	·189	·214	·182	·212	·200	·183	·180	μ
R	...	·046	...	·037	...	·046	...	·029	R
T	...	·086	...	·256	...	·120	...	·237	T
MS	·122	·138	·126	·125	·134	·157	·137	·135	MS
2SM	·039	·025	·048	·036	·033	·036	·049	·046	2SM
2N	·167	·112	·135	·193	·165	·110	·142	·153	2N
M_2N	·162	·104	·103	·102	·115	·124	·070	·130	M_2N
M_2K_1	·083	·039	·027	·084	·090	·034	·030	·103	M_2K_1
$2M_2K_1$	·041	·040	·048	·064	·065	·070	·080	·065	$2M_2K_1$
Mm	·058	·049	·042	·047	·085	·063	·034	·026	Mm
Mf	·068	·054	·054	·029	·052	·046	·046	·083	Mf
MSf	·056	·016	·042	·019	·023	·044	·053	·052	MSf
Sa	·254	·137	·173	·188	·179	·032	·061	·042	Sa
Ssa	·068	·124	·071	·201	·145	·157	·099	·042	Ssa

Values of H's *at Apollo Bandar, Bombay*—(Continued).

Tide	H							Tide
	1886	1887	1888	1889	1890	1891	1892	
	Feet	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·059	0·055	0·067	0·065	0·073	0·073	0·081	S_1
S_2	1·628	1·610	1·631	1·631	1·581	1·567	1·576	S_2
S_4	0·011	0·011	0·010	0·003	0·018	0·016	0·016	S_4
S_6	·003	·003	·005	·001	·003	·003	·004	S_6
S_8	·002	·002	·001	·002	·002	·001	·003	S_8
M_1	·003	·048	·053	·047	·029	·056	·069	M_1
M_2	4·041	4·040	4·069	4·040	4·027	4·037	4·038	M_2
M_3	0·079	0·080	0·076	0·055	0·056	0·058	0·057	M_3
M_4	·140	·122	·135	·143	·145	·139	·146	M_4
M_6	·006	·012	·010	·006	·006	·006	·013	M_6
M_8	·005	·005	·005	·003	·001	·002	·003	M_8
O	·657	·653	·660	·668	·666	·660	·659	O
K_1	1·405	1·395	1·388	1·398	1·402	1·403	1·408	K_1
K_2	0·364	0·402	0·427	0·407	0·383	0·408	0·418	K_2
P	·404	·409	·417	·416	·409	·411	·424	P
J	·048	·093	·136	·118	·067	·118	·142	J
Q	·133	·149	·174	·147	·127	·140	·147	Q
L	·095	·031	·104	·076	·136	·143	·038	L
N	1·001	1·026	1·035	1·010	·976	·993	·974	N
λ	...	...	...	...	...	...	...	λ
ν	0·210	0·295	0·211	0·040	·145	·271	·257	ν
μ	·185	·218	·173	·201	·189	·252	·195	μ
R	...	...	...	...	...	...	...	R
T	...	·138	·239	·199	·057	·152	·237	T
MS	·137	·149	·127	·159	·158	·155	·141	MS
2SM	·029	·027	·043	·047	·035	·046	·047	2SM
2N	·182	·145	·180	·121	·160	·140	·182	2N
M_2N	·096	·143	·064	·147	·093	·155	·056	M_2N
M_2K_1	·098	·053	·026	·089	·091	·030	·047	M_2K_1
$2M_2K_1$	·062	·037	·046	·054	·072	·075	·087	$2M_2K_1$
Mm	·045	·064	·034	·067	·088	·042	·071	Mm
Mf	·061	·015	·071	·038	·017	·050	·049	Mf
MSf	·036	·020	·016	·037	·012	·048	·056	MSf
Sa	·110	·121	·079	·072	·086	·057	·076	Sa
Ssa	·176	·205	·174	·105	·244	·062	·132	Ssa

Values of κ's at Apollo Bandar, Bombay.

Tide	κ								Tide
	1878	1879	1880	1881	1882	1883	1884	1885	
	°	°	°	°	°	°	°	°	
S_1	186·71	184·28	182·22	178·60	178·80	164·80	173·14	168·44	S_1
S_3	2·54	2·42	3·64	3·33	3·79	2·44	1·48	2·87	S_3
S_4	256·52	235·45	238·96	314·62	233·13	5·19	359·18	325·31	S_4
S_6	194·74	178·53	140·39	160·35	182·49	193·09	169·05	184·09	S_6
S_8	86·19	195·95	151·39	69·44	71·57	53·97	123·69	105·52	S_8
M_1	46·19	104·90	51·32	18·71	26·12	77·25	54·86	69·17	M_1
M_2	330·11	329·24	329·72	330·66	330·03	328·84	328·38	329·83	M_2
M_3	32·10	27·92	25·33	11·10	20·56	24·85	25·35	34·26	M_3
M_4	319·69	326·57	314·49	323·51	327·91	326·24	319·68	327·40	M_4
M_6	129·57	110·06	78·90	112·87	124·14	83·41	58·13	95·67	M_6
M_8	315·99	346·72	312·85	12·97	46·28	351·34	356·81	23·81	M_8
O	47·99	48·39	47·53	47·53	48·75	47·92	48·16	47·88	O
K_1	45·75	44·94	45·17	45·12	45·40	44·94	44·90	45·58	K_1
K_2	348·54	352·97	354·60	352·54	350·98	354·77	351·07	346·37	K_2
P	42·31	42·95	43·53	42·23	41·07	44·65	43·84	43·24	P
J	89·12	48·04	61·54	88·09	73·92	40·12	51·97	86·05	J
Q	47·36	60·14	54·73	45·88	50·45	59·38	49·41	35·75	Q
L	299·44	348·38	325·09	306·43	298·18	241·72	328·33	305·05	L
N	311·95	315·21	316·03	314·69	312·23	313·57	312·19	312·50	N
λ	284·22	253·64	157·31	202·54	276·99	265·57	141·25	95·28	λ
ν	319·39	283·16	268·52	8·78	335·86	295·75	261·53	12·92	ν
μ	313·00	293·91	314·24	301·06	317·65	293·72	308·10	295·38	μ
R	...	300·59	...	265·00	...	291·97	...	226·82	R
T	...	45·78	...	2·45	...	52·12	...	349·50	T
MS	16·71	30·01	22·73	25·44	25·31	26·82	21·80	21·01	MS
2SM	91·12	124·67	112·30	109·24	93·99	116·00	112·89	99·97	2SM
2N	290·64	289·38	297·58	252·74	287·98	290·68	298·50	245·94	2N
M_2N	272·04	251·39	311·31	217·90	287·65	266·15	318·00	237·45	M_2N
M_2K_1	184·36	238·41	53·75	128·22	176·54	214·96	74·66	130·58	M_2K_1
$2M_2K_1$	66·29	72·21	76·60	89·38	79·67	70·33	55·29	50·86	$2M_2K_1$
Mm	314·52	355·46	86·07	55·55	36·16	93·89	23·18	63·58	Mm
Mf	346·11	6·76	0·52	250·35	47·42	333·44	2·84	49·34	Mf
MSf	197·66	287·47	183·96	333·58	135·67	190·40	186·96	268·04	MSf
Sa	116·57	329·58	312·56	316·59	355·41	284·65	326·49	98·85	Sa
Ssa	304·35	223·28	162·31	232·34	218·18	185·89	209·22	221·16	Ssa

Values of κ's *at Apollo Bandar, Bombay*—(Continued).

Tide	κ							Tide
	1886	1887	1888	1889	1890	1891	1892	
	°	°	°	°	°	°	°	
S_1	186·18	191·93	186·74	195·38	201·51	201·63	206·66	S_1
S_2	3·01	1·88	2·28	3·01	6·16	5·56	5·15	S_2
S_4	251·57	283·64	305·22	209·54	180·96	220·53	148·23	S_4
S_6	259·88	173·89	158·81	120·26	222·27	184·09	162·41	S_6
S_8	108·44	149·54	196·70	222·51	166·76	221·63	115·56	S_8
M_1	274·53	103·01	37·96	354·58	334·75	74·50	37·76	M_1
M_2	329·56	328·66	329·55	331·00	331·85	331·56	331·05	M_2
M_3	25·01	34·18	31·95	16·39	24·40	16·16	18·23	M_3
M_4	323·65	323·93	319·43	337·48	332·48	340·39	336·28	M_4
M_6	50·94	123·50	80·43	107·48	46·93	109·78	83·97	M_6
M_8	352·03	34·56	28·88	344·93	168·89	340·22	29·64	M_8
O	47·91	46·95	48·76	48·99	48·06	47·22	48·42	O
K_1	45·30	45·09	45·11	45·38	45·77	45·69	45·83	K_1
K_2	351·81	0·27	353·13	348·04	358·55	1·00	355·05	K_2
P	44·13	44·96	46·00	45·00	45·59	45·81	45·00	P
J	90·07	42·17	64·05	90·93	77·17	44·59	58·09	J
Q	39·89	52·76	50·00	44·37	51·82	58·90	49·32	Q
L	322·94	250·97	342·60	323·30	321·26	276·07	305·94	L
N	311·89	312·22	315·45	316·35	317·14	315·06	315·76	N
λ	...	...	...	...	...	...	...	λ
ν	348·41	310·32	272·90	245·85	5·72	326·94	289·56	ν
μ	317·08	293·75	306·94	292·47	320·59	301·17	306·45	μ
R	...	...	...	...	...	...	...	R
T	...	52·06	19·71	344·79	350·84	49·19	17·30	T
MS	23·26	27·98	19·42	33·59	39·10	42·58	40·87	MS
2SM	98·17	124·05	103·57	90·96	115·83	131·82	103·50	2SM
2N	278·31	288·86	307·43	245·87	272·79	287·10	304·25	2N
M_2N	291·94	279·12	325·37	256·73	307·53	299·68	311·04	M_2N
M_2K_1	180·73	236·45	62·62	122·97	167·44	187·70	108·47	M_2K_1
$2M_2K_1$	49·11	53·68	75·37	93·23	92·81	89·90	83·58	$2M_2K_1$
Mm	283·67	120·88	20·53	226·78	262·98	356·47	269·93	Mm
Mf	63·66	331·70	297·46	348·22	17·82	41·84	3·89	Mf
MSf	198·20	72·49	325·41	188·29	338·77	91·87	308·88	MSf
Sa	16·53	318·34	330·49	346·10	358·62	311·74	120·03	Sa
Ssa	147·71	187·20	190·46	181·50	209·56	236·71	181·42	Ssa

PRINCE'S DOCK, BOMBAY.

(*Tidal Observatory, Lat. 18° 57′ N., Long. 72° 50′ E.*)

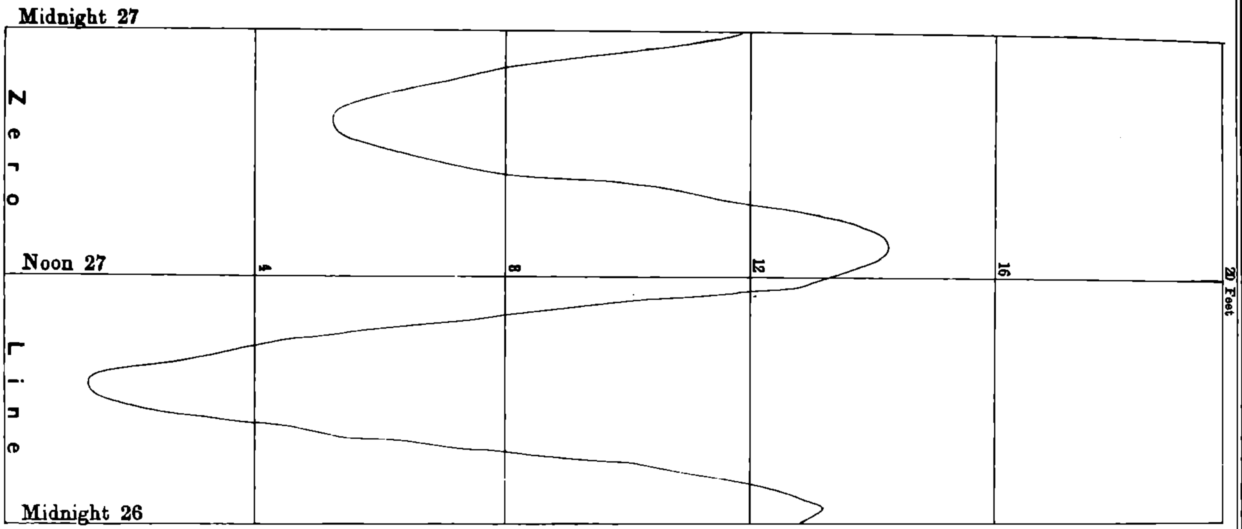
The tidal observatory at Prince's Dock, Bombay, is classed as one of the minor observatories at which five years' observations are generally considered sufficient; but its utility to the port is so great that it seems likely to be kept up indefinitely. It is placed in the light-house tower, a solid masonry structure situated on the pier between the entrances to Prince's Dock, in the position shown on the accompanying chart. A space for the reception of the float-cylinder and a connection with the sea were arranged for in building the pier: the space, twelve feet in diameter and twenty-nine feet deep, forms a well, the walls of which carry the light-house tower: a horizontal communication shaft one foot in diameter and twenty-four feet long leaves the well about three feet above the bottom and passes straight into deep water, between five and six feet below the lowest recorded tides. The float-cylinder is of iron, about twenty-two inches in diameter and twenty-four feet long, which gives ample range for extreme tides. It is supported in the centre of the well by transverse rails built into the walls, its upper end rising two feet above the mouth of the well and its lower end, which is open, being seven feet above the botttom.

The working scale of the tide-gauge is one-twelfth.

Registrations were commenced on the 22nd September, 1888, and, if those taken during the first four months (which were rather frequently interrupted) be excepted, have been highly satisfactory. Such few and unimportant interruptions as have occurred subsequently have generally been due to slight imperfections of the gauge, which is a small one, with upright recording drum, of a less practical design than that of the gauges used at all other Indian tidal observatories, which are of Newman's pattern with long horizontal drum.

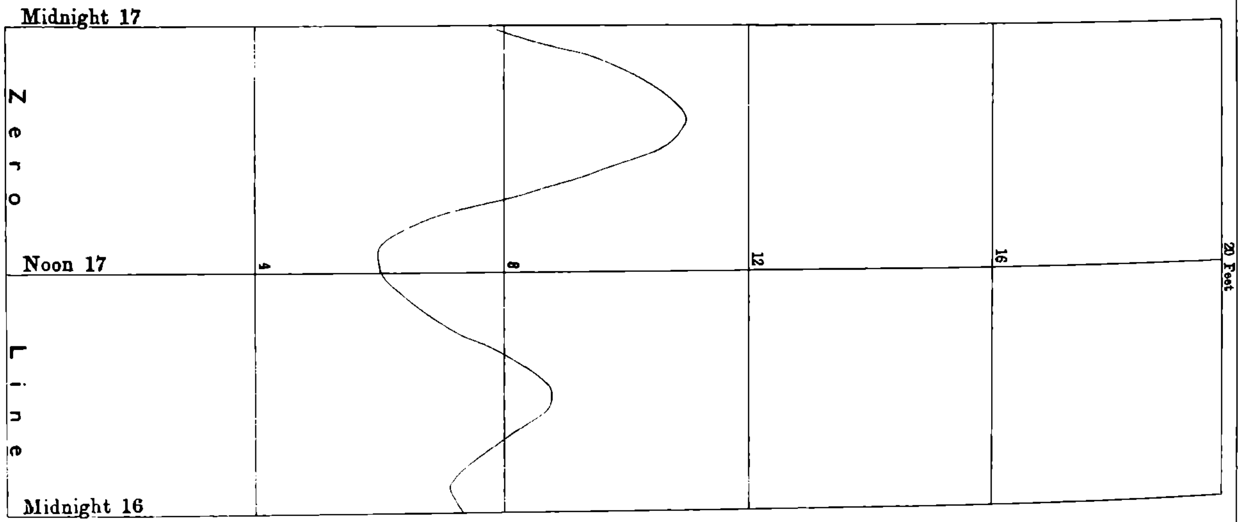
TIDAL CURVES
at
PRINCE'S DOCK, BOMBAY

Spring Tide —— 27th April 1891



Full Moon —— 24th April 1891

Neap Tide —— 17th April 1891



First Quarter —— 16th April 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. July 1899.

Regr. No. D. 118. S. I. D. - May 99 - 500

Barometrical and anemometrical observations are dispensed with at this tidal observatory, as those taken at the neighbouring Meteorological Observatory at Colába supply the necessary statistics.

The bench-mark of reference is the Standard Bench-mark situated at the Public Works Secretariat, consisting of a three-foot cube of polished granite, the top surface of which is the plane of reference. It is 28·000 feet above the zero of the gauge.

The establishment of the Port calculated according to the method employed by the Marine Survey of India = $XI^h\ 28^m$.

The highest high water recorded was 17·0 feet above the zero of the gauge, and occurred in December, 1889.

The lowest low water recorded was 1·6 feet *below* the zero of the gauge, and occurred in November, 1892.

In 1891 the mean range of largest ordinary springs was found to be 13·9 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1888-89	8·306 feet.
1889	8·285 „
1890	8·329 „
1891	8·226 „
1892	8·386 „

NOTE.—The level of the zero of the gauge at Prince's Dock is 2·000 feet above that of the zero of the gauge at Apollo Bandar.

The observatory was inspected in January, 1892, and the following remarks were made on the design and working of the tide-gauge:—

"As the float-band is a very long and thin copper ribbon, it is apt to twist. Much inconvenience "is caused by the tearing of the diagram paper by the zero pencil. The arrangement of this pencil "must be changed. Its position is between the recording drum over which the diagram paper passes "and the cylindrical roll from which that paper unwinds. It therefore acts on a part of the paper which "is not supported behind. As the unwinding roll pays out the paper, the diameter of the roll diminishes, "and the unsupported surface of the paper comes gradually forward and presses more and more on the "point of the zero pencil, until at last a tear is made. This pattern of tide-gauge appears inferior to that "in general use at Indian tidal observatories (Newman's pattern with long horizontal drum). It is more "complicated and liable to get out of order. It is not so easily cleaned. The scale on which it registers "the tidal curve is small and cannot be changed. The float-band, pencil-wire and some other parts are too "frail. There is no arrangement for adjusting the height of the curve-recording pencil; so that setting "to zero is both troublesome and tedious. Measurements cannot be taken from the diagram while the "instrument is working, as may often be desired. Interruptions to the registrations, damage to the dia-"gram paper, such as tears caused by the zero pencil, etc., may not become known until the paper is re-"moved, for the faulty or damaged parts may have been rolled up on the receiving cylinder and have "become concealed during the absence of the clerk from the observatory."

Values of H's *at Prince's Dock, Bombay.*

Tide	H					Tide
	1888-89	1889	1890	1891	1892	
	Feet	Feet	Feet	Feet	Feet	
S_1	0·052	0·067	0·086	0·083	0·092	S_1
S_2	1·656	1·644	1·640	1·605	1·614	S_2
S_4	0·015	0·013	0·030	0·027	0·017	S_4
S_6	·005	·007	·003	·004	·003	S_6
S_8	·002	·002	·002	·001	·002	S_8
M_1	·023	·052	·033	·057	·070	M_1
M_2	4·095	4·115	4·102	4·106	4·112	M_2
M_3	0·082	0·067	0·061	0·067	0·068	M_3
M_4	·128	·126	·134	·113	·128	M_4
M_6	·002	·006	·007	·015	·011	M_6
M_8	·006	·005	·004	·003	·005	M_8
O	·662	·680	·651	·649	·654	O
K_1	1·387	1·390	1·397	1·395	1·404	K_1
K_2	0·410	0·421	0·388	0·403	0·421	K_2
P	·379	·410	·411	·403	·423	P
J	·069	·123	·063	·114	·146	J
Q	·135	·150	·124	·145	·145	Q
L	·113	·068	·148	·184	·045	L
N	1·013	1·004	·986	1·001	·993	N
λ	...	...	...	...	...	λ
ν	0·347	0·097	·148	0·272	·257	ν
μ	·245	·204	·192	·250	·204	μ
R	...	...	...	...	...	R
T	...	·173	·051	·153	·243	T
MS	·158	·154	·138	·139	·119	MS
2SM	·044	·037	·039	·047	·056	2SM
2N	·198	·142	·164	·147	·185	2N
M_3N	:090	·137	·092	·152	·053	M_2N
M_2K_1	·110	·086	·086	·027	·032	M_2K_1
$2M_2K_1$	·048	·052	·067	·069	·081	$2M_2K_1$
Mm	·025	·063	·079	·054	·069	Mm
Mf	·049	·052	·023	·057	·055	Mf
MSf	·020	·020	·030	·062	·049	MSf
Sa	·076	·091	·083	·105	·057	Sa
Ssa	·130	·122	·239	·065	·134	Ssa

Values of κ's at Prince's Dock, Bombay.

Tide	κ 1888-89	1889	1890	1891	1892	Tide
	°	°	°	°	°	
S_1	153·39	189·72	204·20	198·89	200·59	S_1
S_2	1·23	0·99	3·99	3·80	4·14	S_2
S_4	204·70	209·91	202·87	220·44	176·06	S_4
S_6	279·09	301·76	206·57	204·44	185·53	S_6
S_8	141·71	189·46	262·57	172·88	81·03	S_8
M_1	113·89	342·17	319·55	73·95	36·80	M_1
M_2	328·62	329·44	329·62	329·22	329·38	M_2
M_3	32·44	24·15	26·33	12·51	17·52	M_3
M_4	329·94	330·55	320·81	329·60	326·29	M_4
M_6	2·43	162·18	211·48	170·53	122·87	M_6
M_8	76·98	36·04	85·18	85·59	74·58	M_8
O	48·34	48·18	47·29	45·86	47·76	O
K_1	44·14	44·65	44·77	44·28	44·93	K_1
K_2	1·96	353·50	358·01	359·64	354·41	K_2
P	42·95	43·37	43·88	44·05	44·22	P
J	85·54	97·44	78·21	46·56	57·40	J
Q	54·95	42·37	53·31	58·39	49·01	Q
L	284·75	291·50	326·56	271·83	278·05	L
N	311·61	313·37	314·32	314·18	314·88	N
λ	...	...	...	...	...	λ
ν	321·83	280·40	1·91	326·19	289·59	ν
μ	307·79	303·80	319·05	303·31	309·38	μ
R	...	...	...	...	...	R
T	...	319·93	339·65	46·93	13·02	T
MS	29·97	31·99	35·27	42·79	33·66	MS
2SM	74·27	41·71	122·77	120·43	104·68	2SM
2N	258·96	244·02	266·58	287·51	304·04	2N
M_2N	58·16	258·80	302·98	300·10	318·94	M_2N
M_2K_1	152·22	136·92	176·46	212·40	93·43	M_2K_1
$2M_2K_1$	62·89	79·23	84·83	81·80	79·65	$2M_2K_1$
Mm	297·68	229·72	265·35	1·10	274·41	Mm
Mf	344·23	345·69	10·18	36·52	5·83	Mf
MSf	116·96	159·51	27·21	65·40	324·98	MSf
Sa	283·61	330·18	339·21	314·06	132·36	Sa
Ssa	133·91	177·90	208·96	203·13	176·16	Ssa

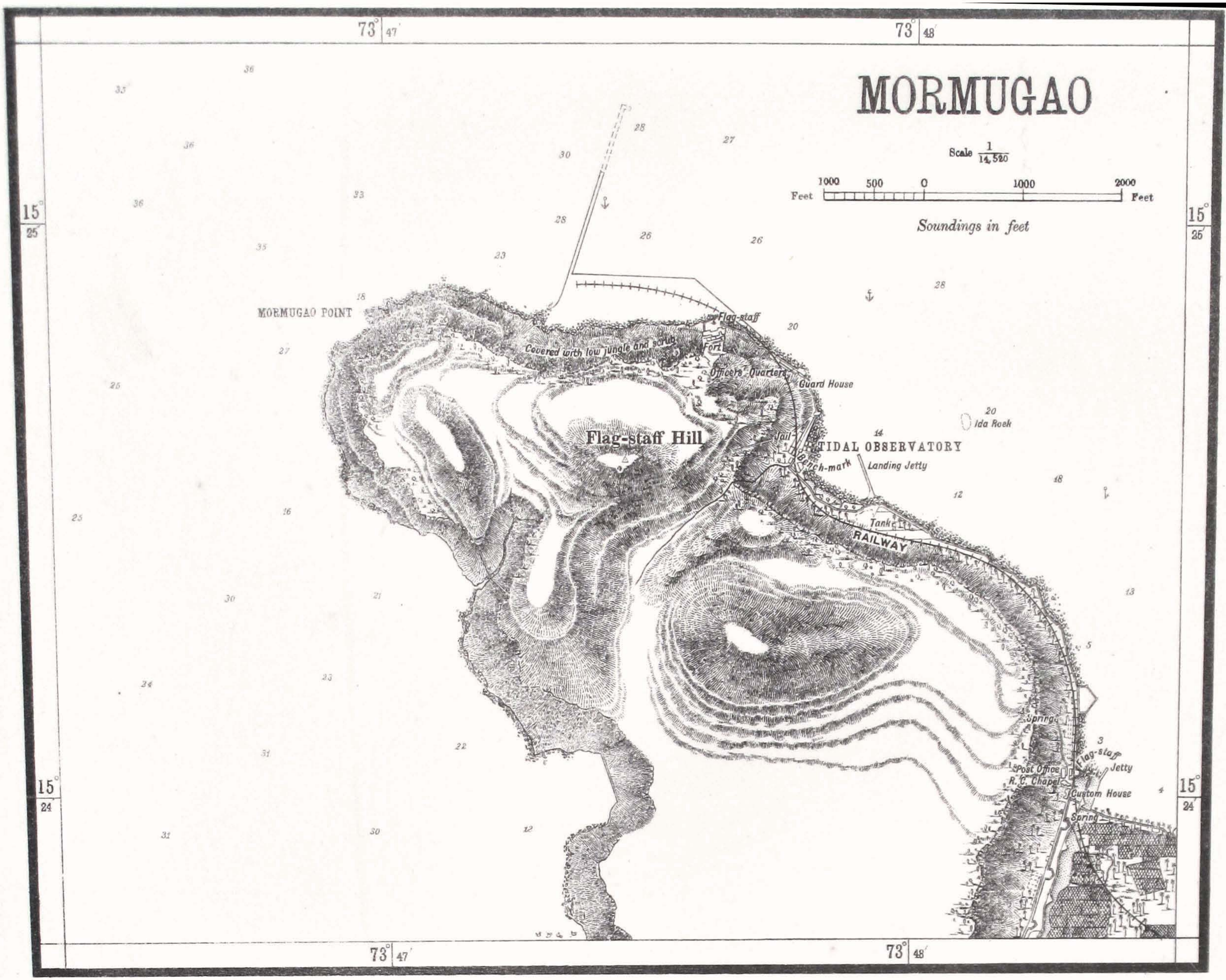
MORMUGÁO.

(Tidal Observatory, Lat. 15° 25′ N., Long. 73° 48′ E.)

The tidal observatory at the Portuguese port of Mormugáo, near Goa, was one of the minor observatories, at which five years' observations are generally sufficient, and was situated on the south side of the iron jetty of the Harbour Works in the position shown on the accompanying chart. The observatory (a small wooden cabin) and the cylinder and tide-gauge, &c., had previously been in use at Kárwár, but the instruments were modified and improved before erection at Mormugáo. The floor of the observatory, which was supported on four wooden piles driven twelve feet into the ground, was on a level with and braced to the platform of the jetty. The float-cylinder, which was eighteen feet long, was fixed with its upper end about four feet below the floor, and this interval was filled by a wooden frame of nineteen and a half inches square section. The top of the cylinder was about five feet above the highest tides and the bottom six feet below the lowest. The communication was by seven small holes drilled about eighteen inches above the bottom of the cylinder which was closed by an iron plate.

The working scale of the tide-guage was one-half.

Registrations were commenced on the 14th March, 1884, and were continued most satisfactorily, with very few and insignificant interruptions, till the 27th March, 1889, when the observatory was dismantled.

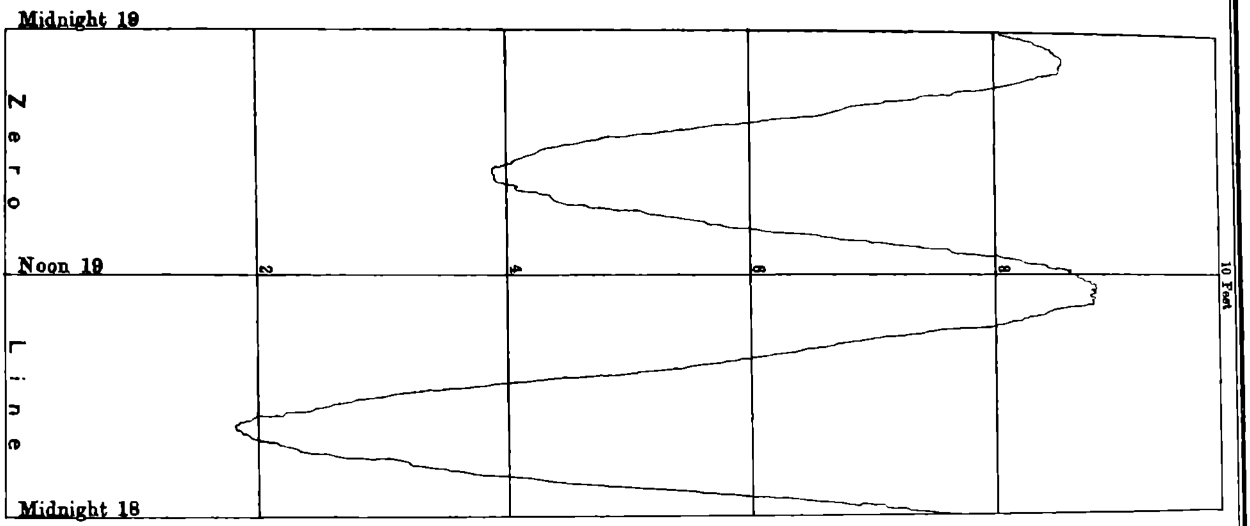


Regr. No. D. 416, S. I. D. - Dec. 99 - 500

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. June 1900.

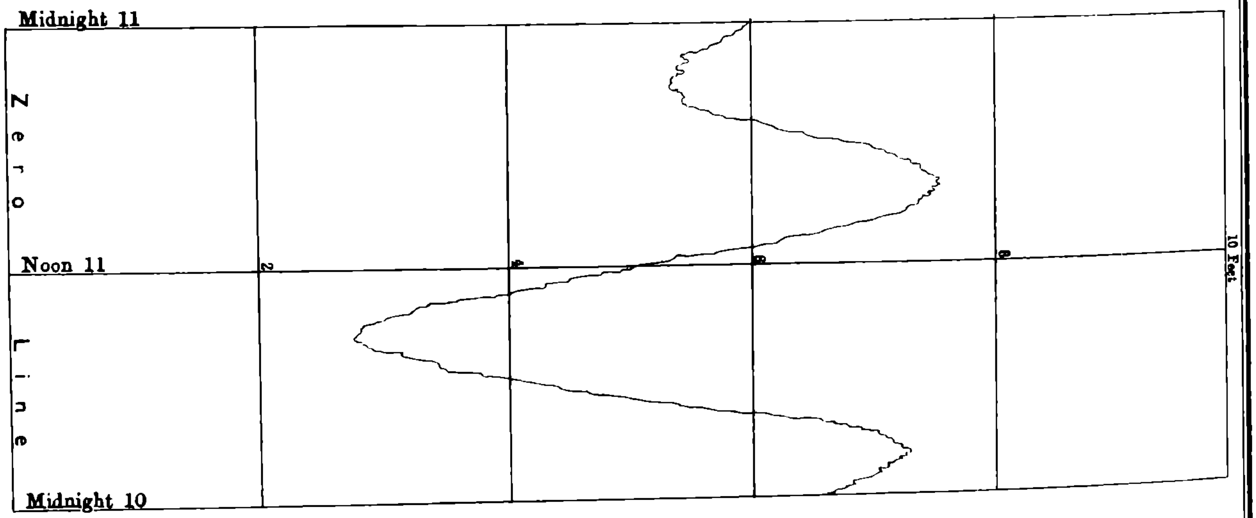
TIDAL CURVES
at
MORMUGAO

Spring Tide —— 19th April 1886



Full Moon 18th April 1886

Neap Tide 11th April 1886



First Quarter 11th April 1886

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, April 1900.

Regd. No. D. 569, S. I. D. - Mar. 1900 - 500

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed near the standard mercurial barometer in the verandah of the building known as the Palace. The anemometer was erected on the top of the fort above the Palace.

The bench-mark of reference is inscribed G.T.S. B. □ M. A.D. 1884. and embedded in masonry, about two and a half feet under the surface of the ground, and about nine feet west of the first embrasure of the old fort (counting from the jetty end) near the iron pile pier. It is 17·823 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = X^h 33^m.

The highest high water recorded was 9·9 feet above the zero of the gauge, and occurred in January, 1885.

The lowest low water recorded was 0·1 foot above the zero of the gauge, and occurred in May, 1884.

In 1886 the mean range of largest ordinary springs was found to be 6·8 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1884-85	5·512 feet.
1885-86	5·577 „
1886-87	5·573 „
1887-88	5·486 „
1888-89	5·451 „

Values of H's *at Mormugáo.*

Tide	H 1884-85	1885-86	1886-87	1887-88	1888-89	Tide
	Feet	Feet	Feet	Feet	Feet	
S_1	0·080	0·041	0·047	0·046	0·050	S_1
S_2	·638	·641	·643	·638	·644	S_2
S_4	·008	·009	·008	·009	·010	S_4
S_6	·003	·005	·004	·005	·004	S_6
S_8	·003	·004	·003	·001	·004	S_8
M_1	·045	·055	·015	·017	·011	M_1
M_2	1·766	1·820	1·835	1·820	1·809	M_2
M_3	0·018	0·015	0·017	0·018	0·019	M_3
M_4	·041	·047	·051	·049	·049	M_4
M_6	·010	·013	·012	·014	·007	M_6
M_8	·012	·011	·017	·013	·012	M_8
O	·516	·524	·520	·522	·522	O
K_1	1·020	1·033	1·026	1·027	1·021	K_1
K_2	0·182	0·179	0·205	0·187	0·182	K_2
P	·300	·305	·289	·300	·305	P
J	·061	·085	·075	·049	·056	J
Q	·099	·119	·111	·099	·112	Q
L	·030	·053	·039	·075	·050	L
N	·427	·438	·427	·434	·439	N
λ	·011	·014	...	...	...	λ
ν	·153	·104	·018	·084	·137	ν
μ	·062	·042	·058	·048	·064	μ
R	...	·006	...	...	...	R
T	...	·068	...	·073	·096	T
MS	·022	·028	·025	·016	·031	MS
2SM	·002	·003	·007	·007	·011	2SM
2N	·062	·069	·074	·050	·062	2N
M_2N	·045	·057	·022	·068	·039	M_2N
M_2K_1	·019	·035	·039	·016	·020	M_2K_1
$2M_2K_1$	·009	·006	·005	·008	·007	$2M_2K_1$
Mm	·048	·029	·015	·049	·010	Mm
Mf	·048	·075	·089	·027	·056	Mf
MSf	·021	·057	·041	·010	·025	MSf
Sa	·306	·165	·291	·356	·226	Sa
Ssa	·075	·055	·133	·191	·128	Ssa

Values of κ's at Mormugáo.

Tide	κ					Tide
	1884-85	1885-86	1886-87	1887-88	1888-89	
	°	°	°	°	°	
S_1	157·27	177·47	171·52	181·50	184·93	S_1
S_2	336·75	332·23	330·54	330·05	329·36	S_2
S_4	108·91	99·97	89·25	86·96	76·10	S_4
S_6	119·75	109·89	127·48	114·34	101·04	S_6
S_8	94·57	24·44	30·58	45·00	43·92	S_8
M_1	97·69	98·02	43·12	31·94	97·64	M_1
M_2	305·20	300·10	299·36	299·18	297·80	M_2
M_3	307·67	299·19	295·64	289·25	283·85	M_3
M_4	20·58	5·62	5·60	2·38	357·30	M_4
M_6	260·96	245·04	254·19	237·94	249·18	M_6
M_8	24·42	19·98	16·29	29·47	22·91	M_8
O	53·03	49·59	47·85	47·66	47·03	O
K_1	48·07	45·78	44·84	44·76	44·48	K_1
K_2	324·00	331·45	324·14	315·57	320·87	K_2
P	49·40	42·88	41·74	44·79	43·50	P
J	42·76	43·16	70·57	74·65	44·50	J
Q	64·02	51·56	41·80	45·16	56·55	Q
L	306·67	338·19	302·74	342·98	309·09	L
N	287·03	282·22	281·15	279·00	278·27	N
λ	323·22	102·50	...	...	...	λ
ν	278·16	253·59	233·27	335·21	301·90	ν
μ	247·48	246·35	248·30	247·73	262·26	μ
R	...	137·86	...	...	...	R
T	...	277·82	...	357·21	312·50	T
MS	59·73	67·22	44·40	28·80	39·70	MS
2SM	201·24	138·43	70·18	150·34	121·40	2SM
2N	238·89	263·34	238·87	228·82	228·49	2N
M_2N	342·97	342·35	336·98	4·55	16·88	M_2N
M_2K_1	335·49	53·64	108·23	159·67	349·54	M_2K_1
$2M_2K_1$	350·96	29·69	91·58	68·74	69·02	$2M_2K_1$
Mm	74·73	358·85	285·62	106·43	300·58	Mm
Mf	13·85	13·91	11·24	153·63	317·72	Mf
MSf	150·99	279·30	354·01	288·86	305·53	MSf
Sa	307·36	333·22	327·53	297·45	301·14	Sa
Ssa	162·57	67·51	147·38	175·30	139·58	Ssa

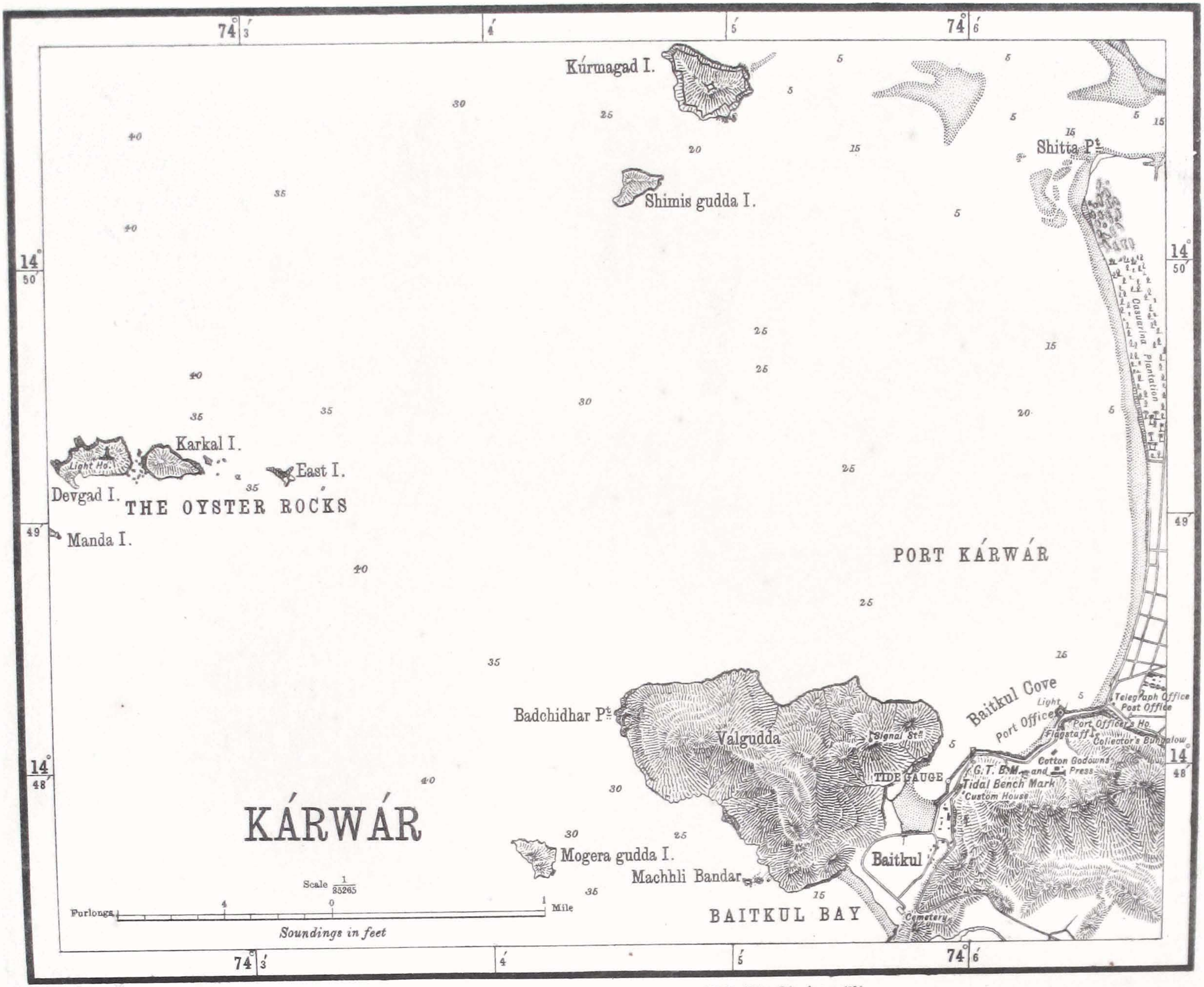
KÁRWÁR.

(*Tidal Observatory, Lat. 14° 48′ N., Long. 74° 6′ E.*)

The tidal observatory at Kárwár in North Kánara on the west coast of India was one of the minor observatories, at which five years' observations are considered sufficient, and was situated on the east side of the Baitkul Cove, three feet away from the wharf wall, in the position shown on the accompanying chart. It was a wooden structure supported by four iron screw-piles. The float-cylinder, of wrought iron, about twenty-two inches in internal diameter, fourteen feet long, and closed at the bottom with an iron plate, descended through the floor of the observatory and was sunk to a depth of about one foot into the ground, there being never less than two feet of water within it or about a foot of water outside it even at the lowest tides. The communication, when the gauge was first set up, was through a short external pipe rising from the bottom length of the cylinder and bent so as to be horizontal at the top where a stop-cock, always under water, was placed, and whence about one hundred and twenty feet of two-inch piping was carried under water, ending in a rose supported some two or three feet above the bottom on a tripod, and having about five feet of water above it at the lowest tides. It was found that by this arrangement the flow of water was retarded, and in the second year the long communication pipe was consequently removed, the short bend attached to the cylinder being retained. The mouth of this bend was closed with a wooden plug perforated with a communication hole one inch in diameter.

The working scale of the tide-gauge was one-half.

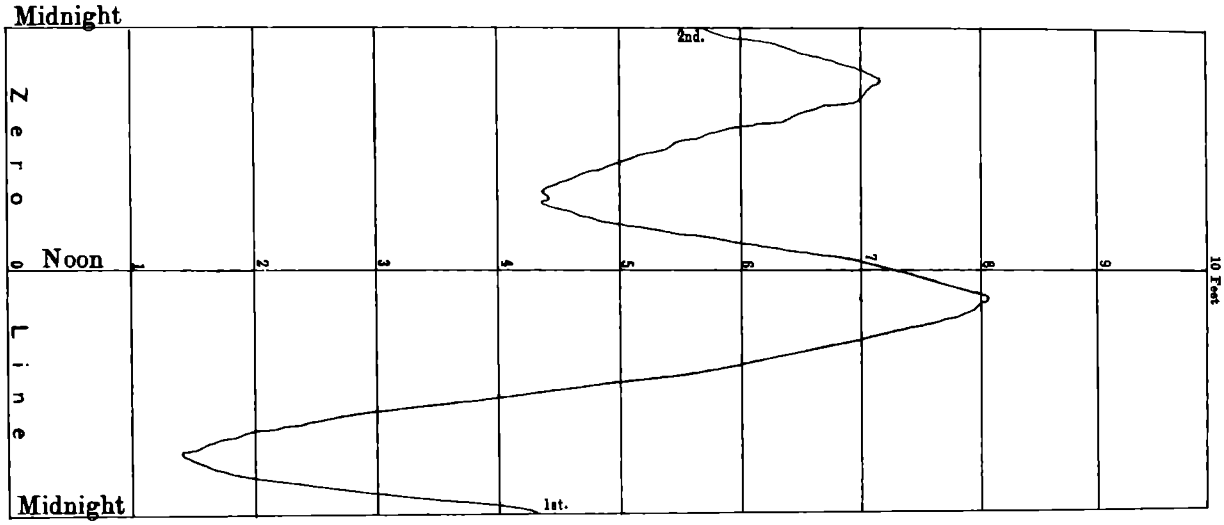
Registrations were commenced on the 1st March, 1878, and were carried on without any break of importance until the 15th April, 1883.



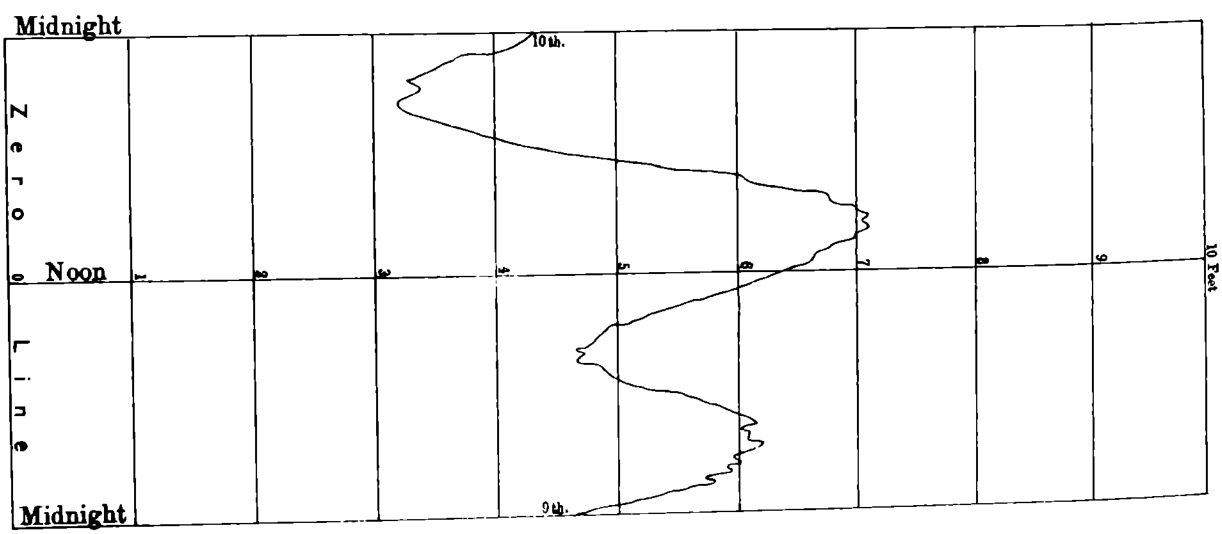
Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, August 1894.

TIDAL CURVES
at
KÁRWÁR

Spring Tide — 1st. August 1879.



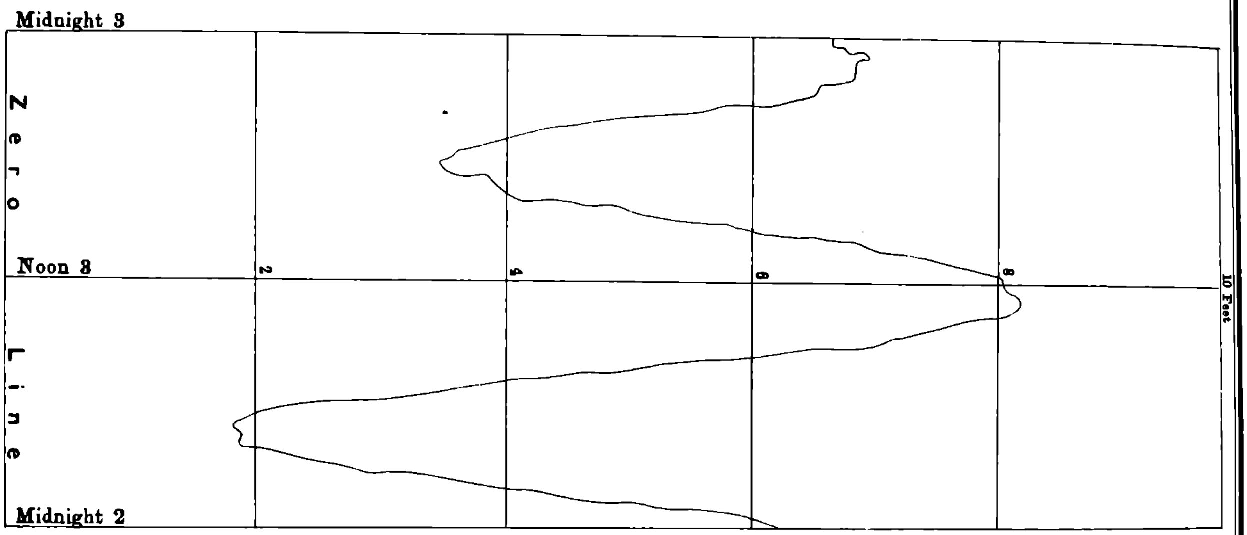
Neap Tide — 9th. August 1879.



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, October 1891.

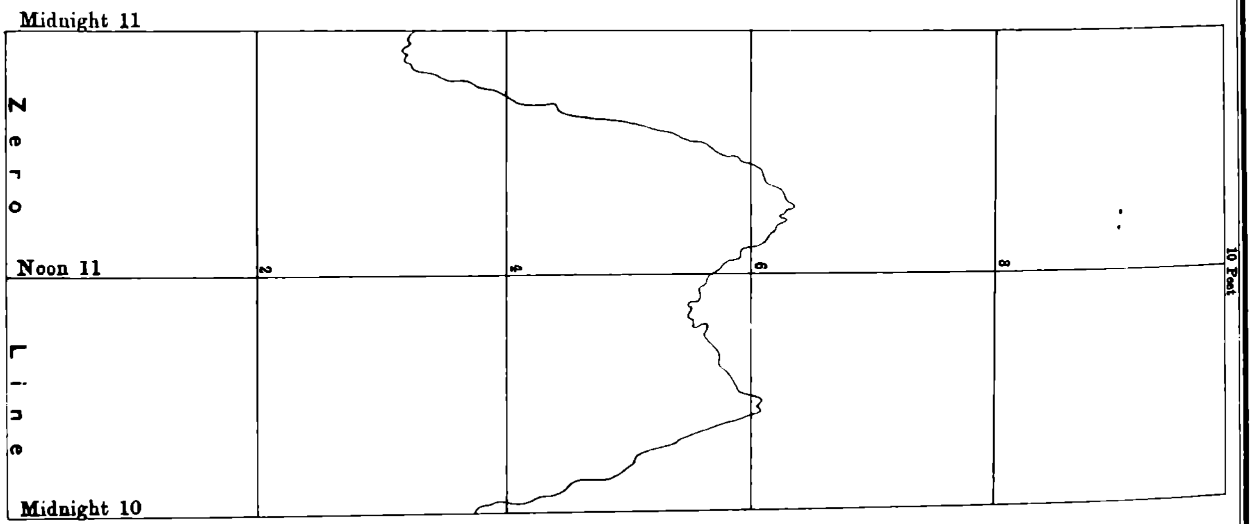
TIDAL CURVES
at
KÁRWÁR

Spring Tide — 3rd August 1879



Full Moon — 2nd August 1879

Neap Tide — 11th August 1879



Last Quarter — 10th August 1879

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, September 1899.

Regd No. D 136, S. L. D. – June 99–500

The action of the tides at Baitkul Cove was peculiar. At rising tide the water would continue to rise in the cylinder for, say, twenty minutes; stop dead; fall for perhaps four or five minutes; rise steadily for half an hour, and then repeat what had happened before. A similar action took place at falling tide. It was not a pumping action in the cylinder due to roughness of the surface water, for on the calmest day the peculiar motion of the water was often most distinct. The cause of this action is obscure. It may perhaps be found in the shape of Baitkul Cove. The gentle currents caused to circulate by the ebb and flow of the tide round the margins of the cove may produce the vibrations observed, which appear to bear some resemblance to those noticed in other confined sheets of water, *e.g.* in the lake of Geneva, where there is a gentle flow of water through the lake.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory, but as that site was not suitable for the anemometer, the latter instrument was placed about four miles off, on Devgad island, one of the Oyster Rocks, where the light-house is situated.

The bench-mark of reference is inscribed G.T.S. □ B.M. and embedded in a block of masonry close to the Travellers' Bungalow. It is 17·324 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = X^h 36^m.

The highest high water recorded was 9·7 feet above the zero of the gauge, and occurred in January, 1882.

The lowest low water recorded was 0·2 feet above the zero of the gauge, and occurred in June, 1880.

In 1878-79 the mean range of largest ordinary springs was found to be 6·7 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1878-79	5·650 feet.
1879-80	5·541 "
1880-81	5·564 "
1881-82	5·515 "
1882-83	5·492 "

Values of H's *at Kárwár.*

TIDE	H					TIDE
	1878-79	1879-80	1880-81	1881-82	1882-83	
	Feet	Feet	Feet	Feet	Feet	
S_1	0·067	0·075	0·055	0·052	0·035	S_1
S_2	·631	·629	·621	·616	·625	S_2
S_4	·007	·007	·016	·011	·011	S_4
S_6	·002	·007	·004	·006	·006	S_6
S_8	·002	·002	·000	·002	·004	S_8
M_1	·019	·017	·049	·045	·036	M_1
M_2	1·724	1·733	1·757	1·754	1·741	M_2
M_3	0·012	0·014	0·018	0·012	0·012	M_3
M_4	·045	·059	·054	·059	·060	M_4
M_6	·013	·010	·013	·011	·009	M_6
M_8	·001	·003	·004	·002	·002	M_8
O	·496	·498	·505	·494	·493	O
K_1	1·001	·996	1·010	1·008	1·006	K_1
K_2	0·175	·174	0·164	0·175	0·180	K_2
P	·269	·274	·282	·287	·274	P
J	·046	·078	·087	·064	·065	J
Q	·111	·133	·130	·101	·097	Q
L	·093	·041	·059	·038	·050	L
N	·416	·426	·413	·400	·397	N
λ	·022	·004	·032	·021	·021	λ
ν	·077	·136	·122	·057	·047	ν
μ	·033	·057	·046	·051	·033	μ
R	...	·006	...	·009	...	R
T	...	·046	...	·075	...	T
MS	·022	·028	·021	·029	·028	MS
2SM	·012	·004	·004	·007	·009	2SM
2N	·054	·050	·084	·043	·052	2N
M_2N	·067	·063	·028	·068	·042	M_2N
M_2K_1	·017	·023	·034	·020	·010	M_2K_1
$2M_2K_1$	·002	·008	·010	·011	·008	$2M_2K_1$
Mm	·046	·061	·048	·043	·126	Mm
Mf	·051	·058	·034	·038	·027	Mf
MSf	·029	·023	·021	·009	·030	MSf
Sa	·170	·344	·491	·383	·373	Sa
Ssa	·045	·083	·128	·053	·033	Ssa

Values of κ's at Kárwár.

Tide	κ 1878-79	1879-80	1880-81	1881-82	1882-83	Tide
	°	°	°	°	°	
S_1	158·71	148·57	156·16	164·75	167·47	S_1
S_2	335·49	336·44	333·98	333·29	334·73	S_2
S_4	114·66	87·36	84·37	109·55	91·64	S_4
S_6	31·61	57·53	82·24	51·34	39·14	S_6
S_8	343·61	295·46	296·57	282·53	302·91	S_8
M_1	70·05	45·49	28·59	10·24	48·45	M_1
M_2	303·21	303·34	300·55	300·87	300·72	M_2
M_3	279·86	285·59	275·29	263·62	260·70	M_3
M_4	28·20	22·11	11·48	16·37	7·26	M_4
M_6	288·51	282·53	277·11	283·85	287·36	M_6
M_8	210·08	50·95	8·76	58·37	215·12	M_8
O	49·72	50·23	48·75	48·39	48·88	O
K_1	46·55	46·56	44·66	44·33	44·85	K_1
K_2	329·58	328·70	327·07	333·49	329·56	K_2
P	41·49	42·73	42·59	40·86	40·05	P
J	51·36	54·61	70·68	67·07	42·28	J
Q	57·10	61·56	54·03	58·23	62·86	Q
L	326·01	325·14	318·48	291·59	323·70	L
N	281·60	283·57	282·57	281·16	279·48	N
λ	243·58	122·14	28·65	340·85	268·47	λ
ν	339·76	296·95	260·60	232·42	338·36	ν
μ	283·28	244·88	260·00	244·24	284·47	μ
R	...	61·03	...	229·83	...	R
T	...	9·46	...	300·28	...	T
MS	80·36	75·49	60·64	59·79	59·77	MS
2SM	30·76	353·33	14·58	106·45	351·28	2SM
2N	238·25	249·05	239·63	252·12	241·42	2N
M_2N	209·78	184·05	183·19	156·13	208·87	M_2N
M_2K_1	270·35	15·49	89·46	151·59	338·28	M_2K_1
$2M_2K_1$	83·44	120·14	87·98	67·41	44·24	$2M_2K_1$
Mm	350·58	14·28	99·91	0·47	31·69	Mm
Mf	345·14	0·82	345·59	14·42	37·39	Mf
MSf	213·90	267·52	221·88	89·22	26·66	MSf
Sa	321·95	307·25	302·72	302·56	317·09	Sa
Ssa	296·82	201·81	191·21	224·01	225·45	Ssa

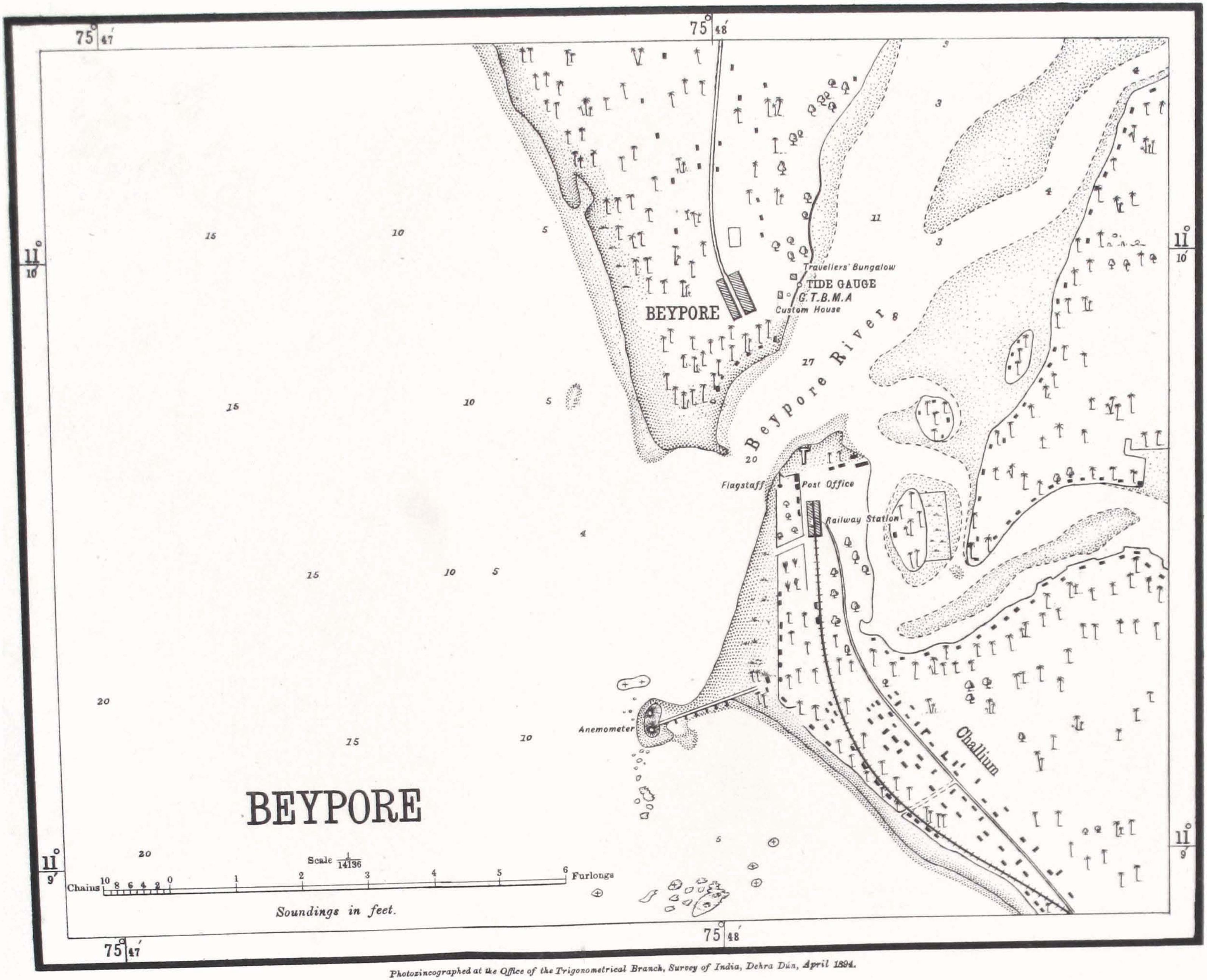
BEYPORE.

(*Tidal Observatory, Lat. 11° 10′ N., Long. 75° 48′ E.*)

The tidal observatory at Beypore, about seven miles south of Calicut, on the west coast of India, was one of the minor observatories at which five years' observations are generally considered sufficient, and was situated on the northern bank of the Back-water about fifty yards south of the Travellers' Bungalow and some six hundred yards from the open sea, in the position shown on the accompanying chart. It was a wooden cabin supported partly on piles and partly on the wall of a former wharf. The iron float-cylinder, twenty-four inches in diameter and about sixteen feet long, was sunk about twelve feet into the bank of the Back-water, there being generally about seven feet of the cylinder below the lowest tides and about four feet of it above the highest. The communication was through a two inch iron external pipe rising vertically from the cylinder near its bottom to a point about two feet below mean-sea-level where a stop-cock, manipulated at high-tide, was fixed for the escape of air. From the stop-cock, which was enclosed in a protecting box, the pipe sloped gently downwards, first through and then over the bank into deep water, its length being about seventy feet. To its outer end a further length of twenty-five feet of flexible tubing was originally attached: this ended in a rose, supported so as to be about twelve feet below the lowest tides. But, after nearly two years' experience of this contrivance, during which time there must have been considerable retardation the tubing was examined and found choked with mud, although admitting water through a break in it, one foot beyond the mouth of the iron pipe. The tubing and rose were therefore removed, and it was found that the iron pipe alone (protected at its mouth by a strong basket) gave, on the whole, satisfactory passage to the water.

The working scale of the tide-gauge was one-half.

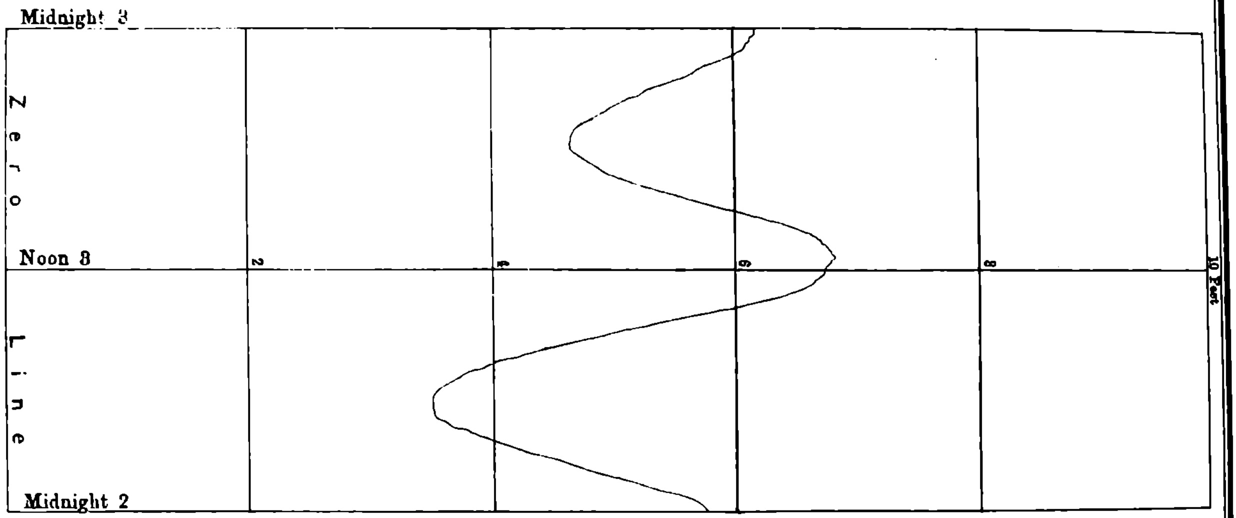
Registrations were commenced on the 1st December, 1878, and, in consequence of some uncertainty about the accuracy of the early observations, were continued to the 14th March, 1885. They were absolutely continuous, and so far satisfactory; but the agreement between the predicted values of the times and heights of high and low water obtained from them and the actual values, is below the average.



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dūn, April 1894.

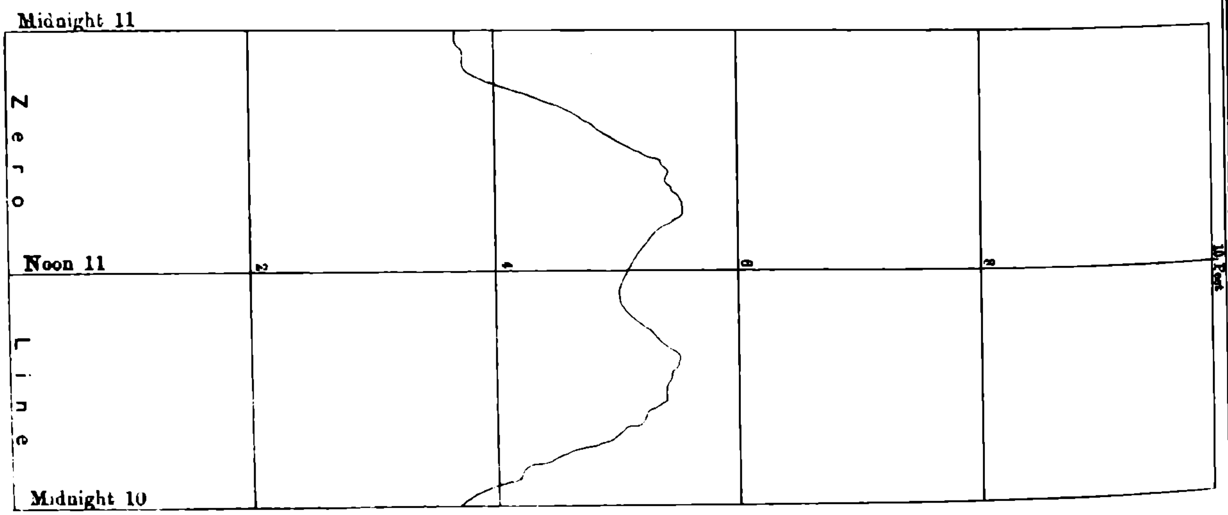
TIDAL CURVES
at
BEYPORE

Spring Tide ____ 3rd August 1879



Full Moon ____ 2nd August 1879

Neap Tide ____ 11th August 1879



Last Quarter ____ 10th August 1879

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, April 1900.

The disturbances of the surface of the ocean, caused by the Krakatoa volcanic eruptions, were recorded at this Tidal Station by the self-registering tide-gauge on the 27th August, 1883.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory, but as that site was not suitable for the anemometer, the latter instrument was set up on the small rocky island situated about half a mile south-west of the Flag-staff.

The bench-mark of reference is a stone embedded in a block of masonry and marked G. T. S. □ B. A. M., situated about a hundred feet east of the front door of the Custom House. It is 19·707 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $XI^h\ 16^m$.

The highest high water recorded was 8·4 feet above the zero of the gauge, and occurred in January, 1882.

The lowest low water recorded was 1·9 feet above the zero of the gauge, and occurred in May, 1884.

In 1878-79 the mean range of largest ordinary springs was found to be 4·1 feet.

The height of mean-sea-level above the zero of the gauge had the following values :—

1878-79	5·385 feet.
1879-80	5·392 „
1880-81	5·412 „
1881-82	5·412 „
1882-83	5·395 „
1883-84	5·301 „

Values of H's *at Beypore.*

TIDE	H						TIDE
	1878-79	1879-80	1880-81	1881-82	1882-83	1883-84	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·021	0·083	0·093	0·073	0·035	0·048	S_1
S_2	·331	·310	·308	·341	·359	·350	S_2
S_4	·004	·003	·004	·006	·007	·007	S_4
S_6	·004	·004	·003	·006	·010	·009	S_6
S_8	·001	·000	·001	·001	·001	·003	S_8
M_1	·017	·032	·038	·024	·032	·055	M_1
M_2	·907	·904	·895	·950	1·001	·999	M_2
M_3	·011	·010	·011	·010	0·009	·008	M_3
M_4	·021	·015	·018	·020	·026	·027	M_4
M_6	·010	·004	·003	·006	·012	·013	M_6
M_8	·008	·010	·007	·008	·009	·009	M_8
O	·337	·338	·334	·337	·356	·362	O
K_1	·704	·691	·683	·715	·727	·730	K_1
K_2	·065	·079	·089	·069	·098	·105	K_2
P	·184	·188	·197	·177	·211	·230	P
J	·035	·047	·064	·040	·034	·073	J
Q	·078	·089	·082	·078	·078	·091	Q
L	·018	·037	·020	·033	·025	·028	L
N	·191	·189	·190	·199	·215	·221	N
λ	·004	·012	·013	·017	·011	·002	λ
ν	·035	·041	·050	·095	·053	·003	ν
μ	·024	·020	·008	·014	·030	·009	μ
R	...	·017	...	·028	...	·013	R
T	...	·043	...	·036	...	·061	T
MS	·010	·004	·005	·008	·016	·015	MS
2SM	·006	·004	·004	·004	·007	·004	2SM
2N	·027	·023	·046	·011	·021	·019	2N
M_2N	·058	·020	·043	·014	·047	·016	M_2N
M_2K_1	·008	·016	·022	·023	·010	·003	M_2K_1
$2M_2K_1$	·011	·019	·014	·009	·004	·004	$2M_2K_1$
Mm	·073	·072	·105	·144	·059	·031	Mm
Mf	·086	·086	·022	·118	·044	·054	Mf
MSf	·066	·037	·017	·041	·028	·037	MSf
Sa	·307	·344	·328	·321	·243	·308	Sa
Ssa	·139	·252	·180	·189	·123	·113	Ssa

Values of κ's at Beypore.

Tide	κ						Tide
	1878-79	1879-80	1880-81	1881-82	1882-83	1883-84	
	°	°	°	°	°	°	
S_1	119·85	206·72	187·29	185·05	172·85	171·77	S_1
S_2	19·96	19·36	21·78	16·61	11·58	11·32	S_2
S_4	139·69	118·30	132·80	144·69	147·53	128·40	S_4
S_6	252·47	244·06	265·76	226·93	247·65	244·94	S_6
S_8	20·56	251·57	45·00	319·40	339·44	95·91	S_8
M_1	145·76	68·68	22·56	39·56	90·35	60·51	M_1
M_2	330·23	329·74	332·96	328·89	323·67	323·52	M_2
M_3	213·51	183·64	199·61	195·90	193·50	198·96	M_3
M_4	45·30	35·80	53·33	40·78	31·39	22·52	M_4
M_6	120·50	114·14	184·37	137·66	132·67	106·13	M_6
M_8	136·69	130·03	139·68	161·96	161·87	158·34	M_8
O	58·02	56·82	58·87	57·03	55·13	55·64	O
K_1	52·37	53·35	54·16	50·71	47·07	48·17	K_1
K_2	11·24	2·79	13·04	11·35	17·06	359·99	K_2
P	48·93	56·07	57·29	53·82	48·46	51·48	P
J	66·65	44·07	84·25	81·78	39·75	33·80	J
Q	67·77	75·93	59·17	62·31	67·28	62·43	Q
L	349·01	340·99	341·51	347·41	1·09	1·88	L
N	305·94	309·11	302·47	306·94	298·94	296·36	N
λ	186·90	1·13	288·64	13·56	354·41	252·58	λ
ν	248·75	20·19	354·07	296·15	276·57	15·13	ν
μ	201·54	349·25	203·27	298·75	238·84	269·00	μ
R	...	163·16	...	100·70	...	126·16	R
T	...	37·30	...	0·13	...	16·94	T
MS	76·22	80·10	100·39	57·14	69·18	60·44	MS
2SM	65·06	218·50	241·47	243·10	350·07	0·54	2SM
2N	236·65	261·18	257·79	265·66	241·61	242·94	2N
M_2N	315·67	32·02	326·03	318·61	350·51	37·88	M_2N
M_2K_1	89·79	350·89	34·80	87·62	130·57	334·69	M_2K
$2M_2K_1$	66·24	40·08	39·44	42·44	104·87	133·24	$2M_2K$
Mm	5·95	85·42	349·81	33·01	43·74	144·22	Mm
Mf	14·59	18·49	50·01	48·04	345·81	158·34	Mf
MSf	228·09	166·84	274·53	197·13	213·94	201·77	MSf
Sa	311·24	315·68	310·74	328·87	298·01	300·79	Sa
Ssa	225·98	181·30	208·39	193·16	214·49	208·26	Ssa

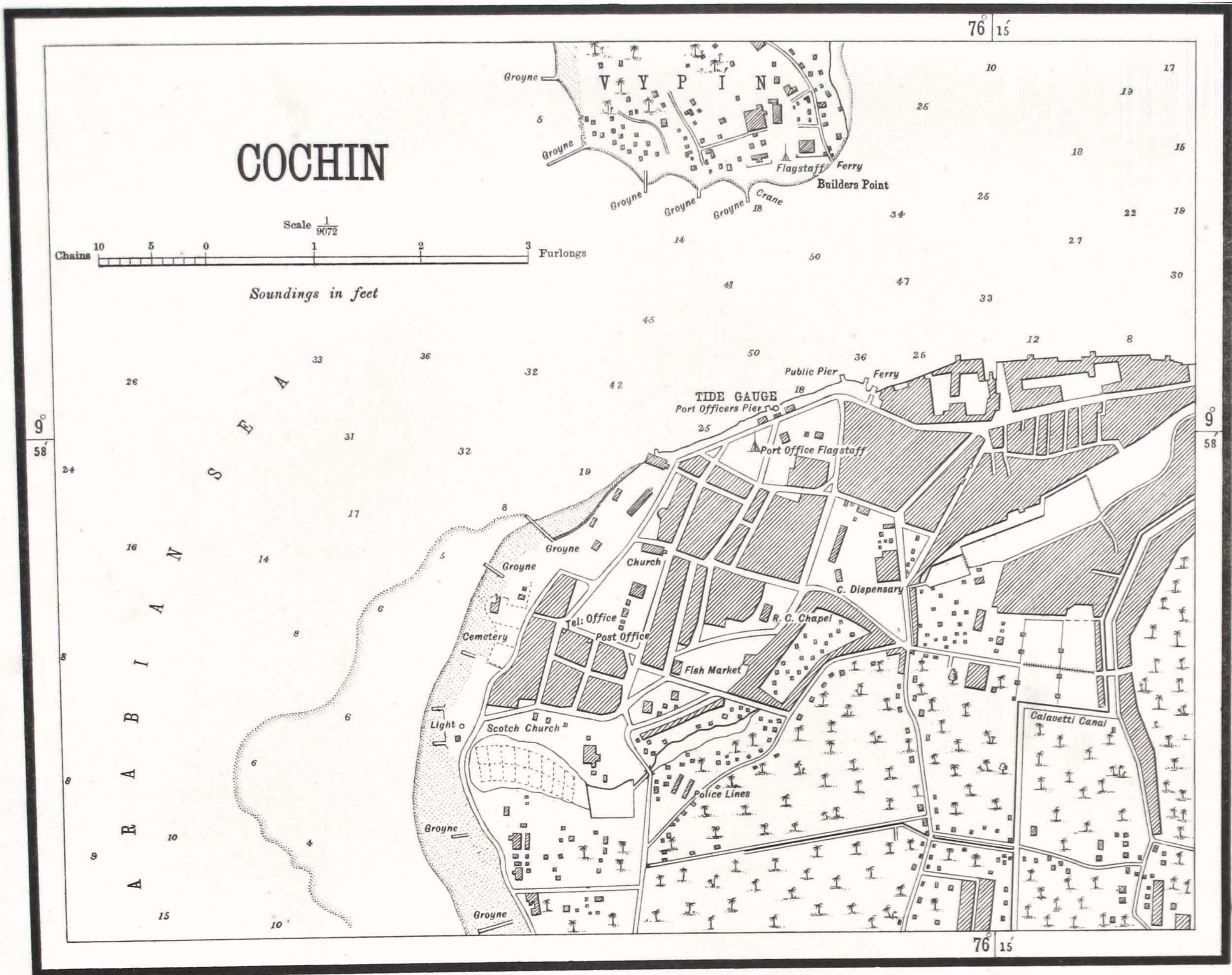
COCHIN.

(Tidal Observatory, Lat. 9° 58′ N., Long. 76° 15′ E.)

The tidal observatory at Cochin, the southernmost tidal observatory on the west coast of India, was one of the minor observatories at which five years' observations are generally considered sufficient. It was situated in the town, and within the Store-yard of the Marine Department, on the left or southern bank of what is known as the Cochin River (a passage from the backwater to the sea dividing Vypín from the town of Cochin), in the position shown on the accompanying chart. It was a wooden cabin supported on the bank by nine short piles. The float-cylinder was twenty-four inches in diameter and twelve feet long and was sunk nine feet in the bank so that its lower end should be about four feet below the lowest tides and its upper end about four feet above the highest. Both observatory and cylinder were brought from Beypore after the dismantling of the tidal observatory at that station in March, 1885; three out of the four lengths forming the cylinder being utilised. The communication was through a straight, horizontal, three-inch pipe, thirty-six feet long, which left the cylinder two feet above its bottom and after passing through about ten feet of the bank entered the water about two feet below the lowest tides. Its outer end was about one foot above the river-bed and was fitted originally with a rose; but after being over four years in use, the rose, which was greatly corroded, fell off, and a basket was substituted for it and found to answer.

The working scale of the tide-gauge was the natural scale.

Registrations were commenced on the 25th January, 1886, and continued satisfactorily until the 9th of the following July, when the driving clock stopped and could not be set going again for about a fortnight. On the 4th April, 1887, during boisterous weather, a surprising accumulation of sand formed over the mouth of the communication pipe and in spite of strenuous, but unavailing, efforts to clear it away, rendered the tidal curves inaccurate and interrupted until the 26th of the following month, when the action of the water unexpectedly removed the accumulation. After this, the registrations were highly satisfactory until their close, on the 20th March, 1892, when an extra year's observations (taken in consideration of the imperfections mentioned) were completed.

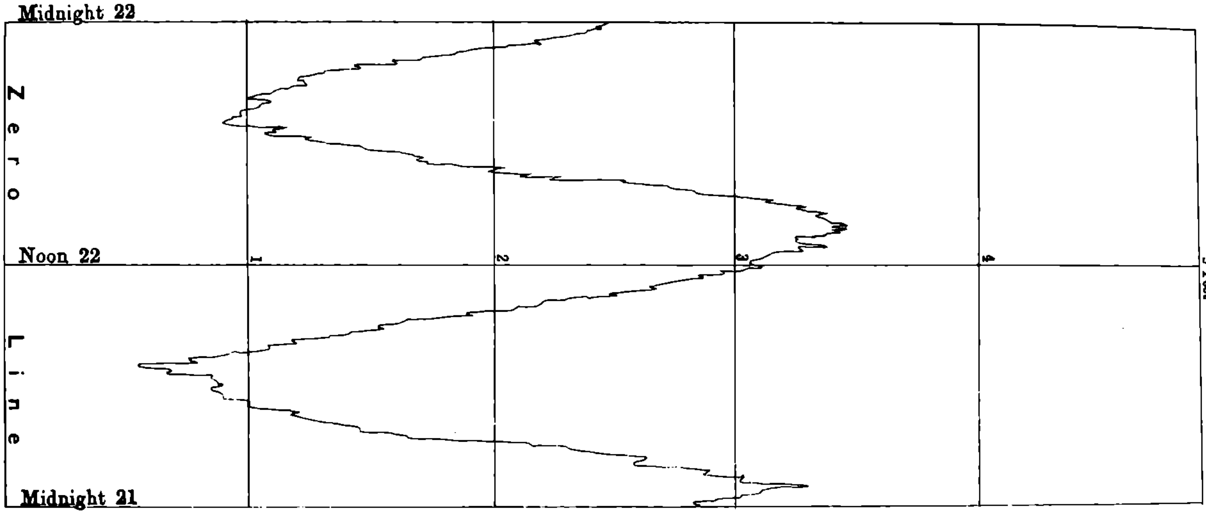


S. I. D. - Nov. 94 - 500

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dûn, November 1894.

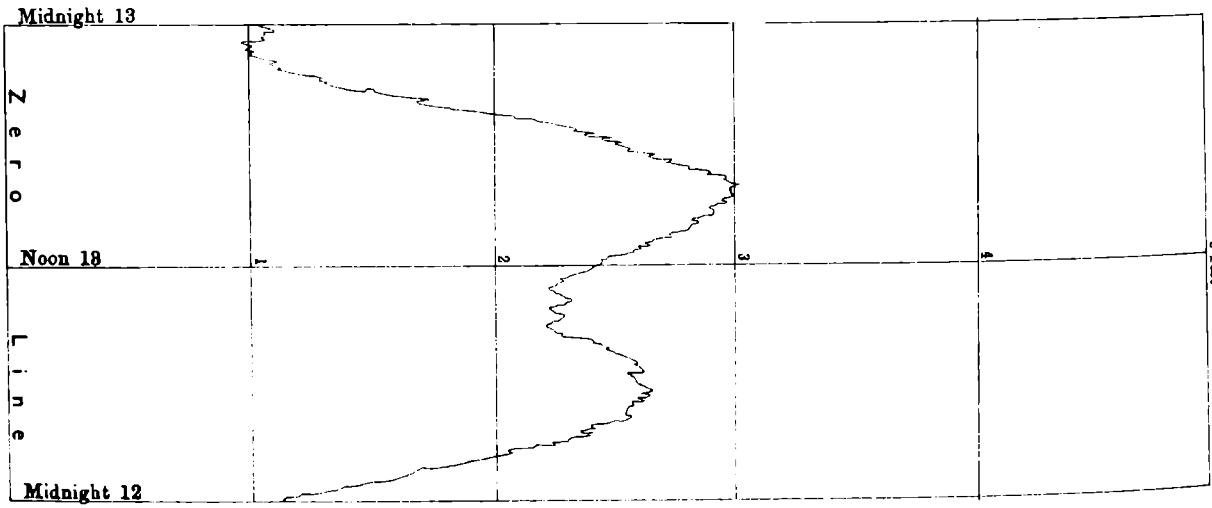
TIDAL CURVES
at
COCHIN

Spring Tide — 22nd August 1891



Full Moon — 19th August 1891

Neap Tide — 13th August 1891



First Quarter — 12th August 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. March 1900.

Occasional very rapid changes of level of the water to the extent of about a foot—due to squalls—are a feature of the Cochin tides.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory; but as that site was not suitable for the anemometer, the latter instrument was set up about half a mile away, on a mound close to, and N.W. of the Light-house.

The bench-mark of reference is a granite stone, six feet long and two and a half feet broad, inscribed G.T.S. □ A B.M., and embedded in a block of masonry in the centre of the verandah of the Port Office, which is about fifty yards south of the site of the tidal observatory. It is 8·93 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $XI^h 26^m$.

The highest high water recorded was 4·7 feet above the zero of the gauge, and occurred in December, 1887.

The lowest low water recorded was 0·2 foot *below* the zero of the gauge, and occurred in May, 1889.

In 1890 the mean range of largest ordinary springs was found to be 3·2 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1886-87	2·422 feet.
1887-88	2·359 „
1888-89	2·307 „
1889-90	2·421 „
1890-91	2·345 „
1891-92	2·331 „

Values of H's *at Cochin.*

Tide	H						Tide
	1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·031	0·039	0·024	0·028	0·026	0·024	S_1
S_2	·256	·270	·259	·256	·260	·265	S_2
S_4	·006	·008	·007	·005	·004	·005	S_4
S_6	·007	·005	·005	·005	·005	·007	S_6
S_8	·002	·002	·002	·002	·002	·001	S_8
M_1	·010	·008	·017	·033	·024	·017	M_1
M_2	·731	·731	·722	·730	·720	·727	M_2
M_3	·005	·004	·007	·008	·016	·016	M_3
M_4	·028	·025	·024	·024	·027	·029	M_4
M_6	·009	·011	·009	·011	·008	·008	M_6
M_8	·002	·003	·005	·002	·004	·007	M_8
O	·306	·326	·307	·308	·298	·306	O
K_1	·586	·602	·596	·591	·580	·591	K_1
K_2	·089	·063	·083	·078	·083	·086	K_2
P	·163	·175	·162	·165	·163	·168	P
J	·026	·039	·048	·052	·031	·034	J
Q	·068	·082	·084	·085	·069	·063	Q
L	·027	·041	·035	·029	·019	·031	L
N	·153	·175	·160	·154	·147	·145	N
λ	·013	...	...	...	...	...	λ
ν	·033	·053	·053	·029	·016	·048	ν
μ	·009	·032	·006	·007	·008	·003	μ
R	...	...	...	...	...	...	R
T	...	·058	·030	·025	·039	·028	T
MS	·020	·018	·020	·017	·023	·021	MS
2SM	·004	·009	·003	·003	·005	·002	2SM
2N	·014	·022	·015	·031	·021	·013	2N
M_2N	·023	·014	·027	·014	·023	·021	M_2N
M_2K_1	·037	·025	·020	·035	·038	·025	M_2K_1
$2M_2K_1$	·017	·021	·021	·015	·018	·020	$2M_2K_1$
Mm	·014	·035	·055	·058	·054	·031	Mm
Mf	·070	·072	·056	·041	·025	·071	Mf
MSf	·037	·042	·026	·025	·015	·024	MSf
Sa	·309	·418	·286	·363	·352	·295	Sa
Ssa	·134	·161	·159	·072	·109	·073	Ssa

Values of κ's at Cochin.

Tide	κ						Tide
	1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	
	°	°	°	°	°	°	
S_1	161·45	226·56	187·83	179·39	186·19	189·26	S_1
S_2	25·81	37·09	26·88	26·87	28·42	30·71	S_2
S_4	203·07	138·24	153·82	173·29	188·13	192·76	S_4
S_6	226·17	222·44	221·99	211·37	250·77	228·01	S_6
S_8	162·47	296·57	327·27	210·47	277·43	284·04	S_8
M_1	5·49	87·01	86·67	20·37	356·30	71·36	M_1
M_2	331·52	330·48	332·84	331·79	333·27	332·79	M_2
M_3	158·79	264·85	211·29	216·22	206·55	206·26	M_3
M_4	76·36	64·29	74·42	71·18	80·33	83·99	M_4
M_6	95·32	79·89	79·07	82·92	83·54	98·45	M_6
M_8	287·28	12·21	318·35	338·23	305·64	332·41	M_8
O	58·21	56·03	58·22	59·31	59·63	59·46	O
K_1	50·99	52·68	52·11	51·60	52·24	52·16	K_1
K_2	26·05	20·65	21·99	22·55	23·98	23·26	K_2
P	52·49	42·88	50·65	50·69	53·31	49·70	P
J	77·35	48·60	49·78	81·80	80·72	43·85	J
Q	60·49	61·60	70·55	65·31	69·85	80·11	Q
L	24·44	332·37	355·33	338·58	1·79	359·25	L
N	300·67	299·91	304·86	305·43	303·53	302·08	N
λ	320·82	...	...	...	...	...	λ
ν	355·39	334·48	286·74	255·74	10·22	344·51	ν
μ	168·39	203·60	196·44	176·20	160·15	101·83	μ
R	...	...	...	...	...	...	R
T	...	8·92	6·88	84·48	47·25	3·16	T
MS	135·40	143·47	125·91	139·14	149·26	146·10	MS
2SM	324·13	128·55	334·33	324·85	333·56	310·49	2SM
2N	274·08	185·45	256·90	245·29	268·07	275·28	2N
M_2N	101·66	64·94	146·75	76·07	125·40	101·89	M_2N
M_2K_1	131·29	137·81	113·83	117·17	140·75	143·79	M_2K_1
$2M_2K_1$	107·19	108·24	109·46	98·96	110·54	106·82	$2M_2K_1$
Mm	50·00	111·89	20·82	185·96	229·68	315·04	Mm
Mf	355·35	36·39	285·07	343·46	31·82	6·95	Mf
MSf	292·52	310·90	295·51	252·88	138·11	317·23	MSf
Sa	312·98	296·49	296·46	293·32	299·46	312·95	Sa
Ssa	153·95	160·90	136·80	167·72	193·41	89·46	Ssa

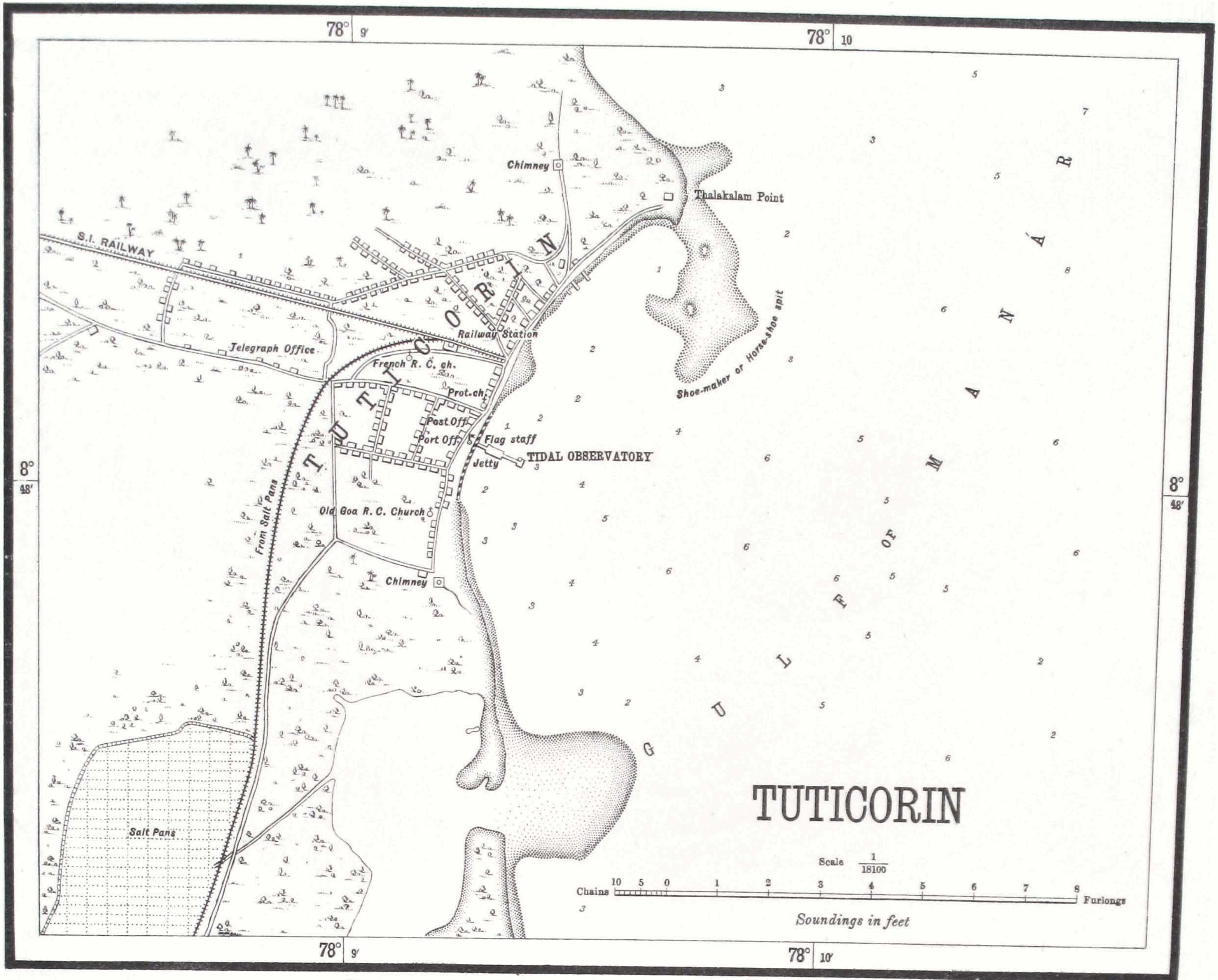
TUTICORIN.

(*Tidal Observatory, Lat. 8° 48′ N., Long. 78° 9′ E.*)

The tidal observatory at Tuticorin on the western shore of the Gulf of Manar, and the southernmost tidal observatory on the east coast of India, is one of the minor observatories at which five years' observations are considered sufficient. It is situated in the north re-entering angle of the T-head of the Government Jetty, in the position shown on the accompanying chart. It is a well-constructed wooden cabin supported on stout piles. It is isolated from the jetty, and made safe from the impact of boats by outer piles braced together. The iron float-cylinder is twenty-four inches in diameter and eight feet long. It is suspended from its upper flange which rests on the strongly-framed floor of the observatory, three feet above the highest tides: its lower portion is firmly secured by iron bars extending to the supporting piles: its bottom is closed with an iron plate containing five half-inch perforations for the passage of the water, and is about one foot below the lowest tides.

The working scale of the tide-gauge is the natural scale.

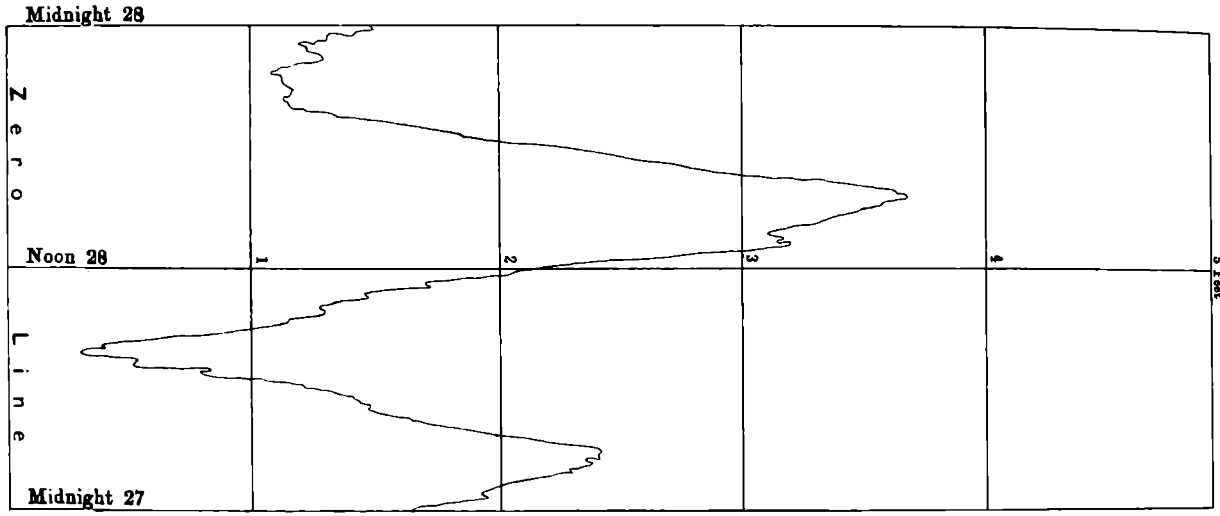
Registrations were commenced on the 1st June, 1888, and have been proceeding most satisfactorily up to the present. A feature of the Tuticorin tides is their great susceptibility to the influence of the wind; sudden changes of the level of the water, as much as a foot in an hour, due to wind, having been recorded. Another peculiarity of the Tuticorin tides, and of the tides in the Gulf of Manar generally, is that, contrary to what might be expected, the mean-sea-level during the south-west monsoon



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, January 1898.

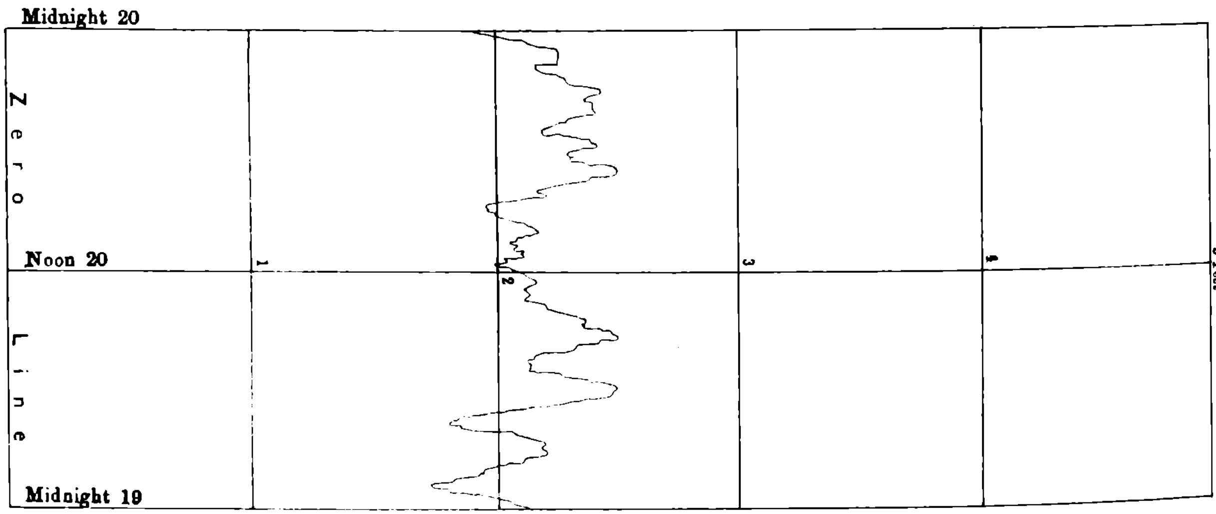
TIDAL CURVES
at
TUTICORIN

Spring Tide ____ 28th May 1892



New Moon ____ 26th May 1892

Neap Tide ____ 20th May 1892



Last Quarter ____ 19th May 1892

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, September 1900.

Regr. No. D. 792, S. L. D. - July 1900 - 500

is considerably lower than during the north-east monsoon. The yearly mean range of the tide in the Gulf is less than two feet, but during August the monthly mean value of mean-sea-level falls lower than during December by as much as 10·6 inches. This well illustrates the fact that tidal observations taken during one lunation only, may not, as it is sometimes assumed they do, supply a good working value of mean-sea-level for spirit-levelling purposes.

Barometrical and anemometrical observations have been carried on simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference is a stone inscribed G.T.S. □ B.M. and set flush with the level of the verandah floor immediately under the staircase of the Port Office. It is 9·063 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = I^h 28^m.

The highest high water recorded was 4·5 feet above the zero of the gauge, and occurred in April, 1893.

The lowest low water recorded was 0·1 foot *below* the zero of the gauge, and occurred in June, 1891.

In 1890-91 the mean range of largest ordinary springs was found to be 3·2 feet.

The height of mean-sea-level above the zero of the gauge had the following values :—

1888-89	...	...	...	2·091 feet.
1889-90	...	...	...	2·186 „
1890-91	...	...	...	2·149 „
1891-92	...	...	...	2·074 „

Values of H's *at Tuticorin.*

Tide	H 1888-89	1889-90	1890-91	1891-92	Tide
	Feet	Feet	Feet	Feet	
S_1	0·034	0·043	0·057	0·040	S_1
S_2	·458	·466	·478	·473	S_2
S_4	·005	·005	·005	·006	S_4
S_6	·007	·007	·007	·004	S_6
S_8	·005	·015	·014	·007	S_8
M_1	·003	·017	·017	·004	M_1
M_2	·656	·658	·666	·667	M_2
M_3	·018	·022	·022	·019	M_3
M_4	·024	·024	·024	·026	M_4
M_6	·013	·016	·015	·016	M_6
M_8	·006	·002	·006	·013	M_8
O	·114	·127	·119	·111	O
K_1	·300	·294	·300	·308	K_1
K_2	·128	·135	·123	·128	K_2
P	·076	·072	·078	·075	P
J	·021	·010	·021	·022	J
Q	·032	·042	·039	·028	Q
L	·026	·023	·032	·042	L
N	·083	·080	·085	·084	N
λ	...	...	...	...	λ
ν	·002	·027	·031	·024	ν
μ	·019	·021	·025	·028	μ
R	...	...	...	...	R
T	...	·021	·008	·025	T
MS	·008	·011	·012	·013	MS
2SM	·005	·004	·009	·009	2SM
2N	·005	·003	·021	·010	2N
M_2N	·019	·022	·014	·023	M_2N
M_2K_1	·009	·007	·002	·005	M_2K_1
$2M_2K_1$	·005	·008	·007	·005	$2M_2K_1$
Mm	·059	·048	·007	·051	Mm
Mf	·039	·029	·037	·063	Mf
MSf	·013	·012	·011	·046	MSf
Sa	·289	·348	·289	·241	Sa
Ssa	·241	·093	·109	·152	Ssa

Values of κ's at Tuticorin.

Tide	κ 1888-89	κ 1889-90	κ 1890-91	κ 1891-92	Tide
	°	°	°	°	
S_1	62·98	58·39	59·38	51·16	S_1
S_2	84·90	84·20	82·70	83·10	S_2
S_4	227·35	238·63	232·70	238·86	S_4
S_6	180·83	176·68	201·16	145·22	S_6
S_8	224·09	230·60	227·92	222·17	S_8
M_1	137·47	52·68	39·21	354·88	M_1
M_2	44·10	44·32	42·71	42·71	M_2
M_3	163·26	161·82	159·65	160·30	M_3
M_4	161·88	154·32	155·15	152·33	M_4
M_6	8·51	22·70	23·14	22·79	M_6
M_8	304·57	264·50	245·76	292·36	M_8
O	48·90	44·58	46·17	47·45	O
K_1	26·77	27·72	27·85	27·04	K_1
K_2	85·28	81·55	81·09	85·57	K_2
P	9·97	11·81	3·31	13·13	P
J	65·05	19·57	32·27	63·59	J
Q	79·63	66·77	73·54	77·88	Q
L	63·90	41·93	78·48	23·20	L
N	32·26	32·43	33·21	35·11	N
λ	...	...	...	...	λ
ν	33·40	63·61	24·83	3·50	ν
μ	92·71	95·14	92·87	91·48	μ
R	...	...	...	...	R
T	...	45·80	173·07	130·87	T
MS	263·31	250·88	260·97	259·05	MS
2SM	303·44	359·04	315·01	304·64	2SM
2N	6·39	299·61	43·41	95·65	2N
M_2N	75·24	47·58	91·63	81·97	M_2N
M_2K_1	94·36	140·22	264·97	32·67	M_2K_1
$2M_2K_1$	353·54	322·71	297·24	232·92	$2M_2K_1$
Mm	22·76	74·70	125·95	219·93	Mm
Mf	358·52	328·37	4·48	359·84	Mf
MSf	348·03	293·96	258·80	276·09	MSf
Sa	311·80	297·57	313·80	316·17	Sa
Ssa	71·95	111·84	77·25	55·62	Ssa

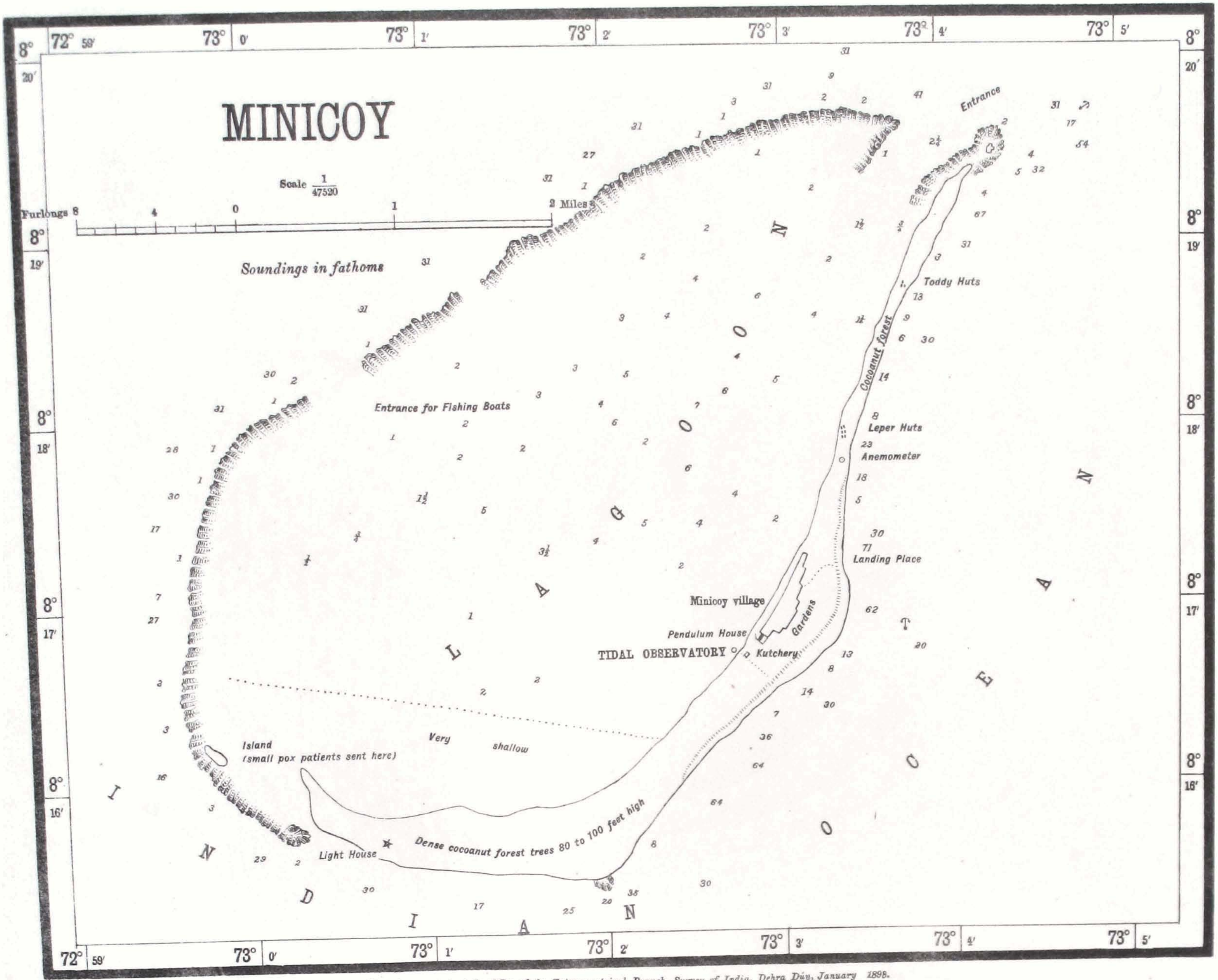
MINICOY.

(*Tidal Observatory, Lat. 8° 17′ N., Long. 73° 3′ E.*)

Minicoy is a solitary coral island situated in the Indian Ocean between the 8° and 9° channels, two hundred and seventy nautical miles west of Cape Comorin. The tidal observatory is one of the minor observatories, at which five years' observations are considered sufficient, and special interest attaches to it owing to its position in mid-ocean. It stands within the lagoon, in the position shown on the accompanying chart, one hundred and ten feet from the shore, and opposite the kacheri, at the southern end of the only village on the island. It is a wooden cabin, ten feet square, resting on a stout level framework of cocoanut logs supported on nine cocoanut piles sixteen or seventeen feet long, well driven into the sand and coral, and firmly braced. The float-cylinder is a massive iron drainage pipe, twenty inches in internal diameter and twelve and a half feet long, braced firmly to the piles by beams, and having its bottom about two and a half feet below lowest tides and its top about six feet above highest. Its bottom is plugged with a perforated wooden disc and rests on a large stone block whose upper face is grooved to take the rim and hollowed out under the centre of the cylinder, the hollow being connected by openings on each side with the external water which has thus free communication with the float.

The working scale of the tide-gauge is one-half.

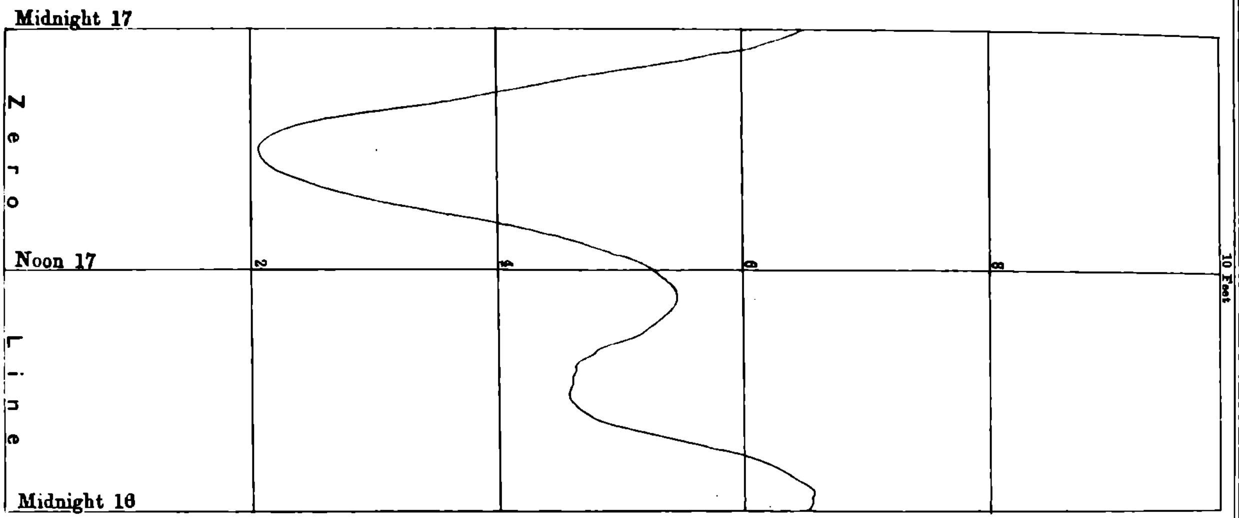
Registrations were commenced on the 12th January, 1891, and have been highly satisfactory up to the present.



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, January 1898.

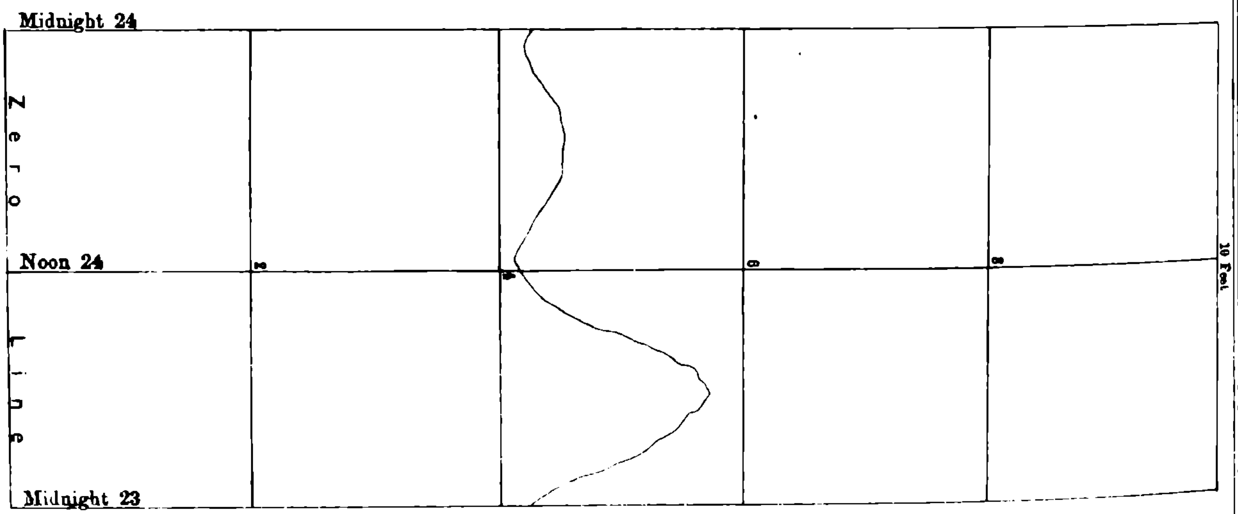
TIDAL CURVES
at
MINICOY

Spring Tide — 17th November 1891



Full Moon — 16th November 1891

Neap Tide — 24th November 1891



Last Quarter — 23rd November 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun, September 1900.

Regr. No. D 861, S. I. D. - April 1900 - 800

Barometrical and anemometrical observations are being carried on simultaneously with the tidal observations. The barometer was placed in the observatory, but as that site was unsuitable for the anemometer, the latter instrument was set up two miles north of the tidal observatory on a slight elevation which is exceptionally open, and free from tall trees.

The bench-mark of reference is a stone inscribed G.T.S. □ A. B.M. embedded one hundred and thirteen and a half feet east of the N.E. corner of the kacheri. It is 10·046 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = X^h 52^m.

The highest high water recorded was 7·7 feet above the zero of the gauge, and occurred in January, 1893.

The lowest low water recorded was 1·8 feet above the zero of the gauge, and occurred in November, 1892.

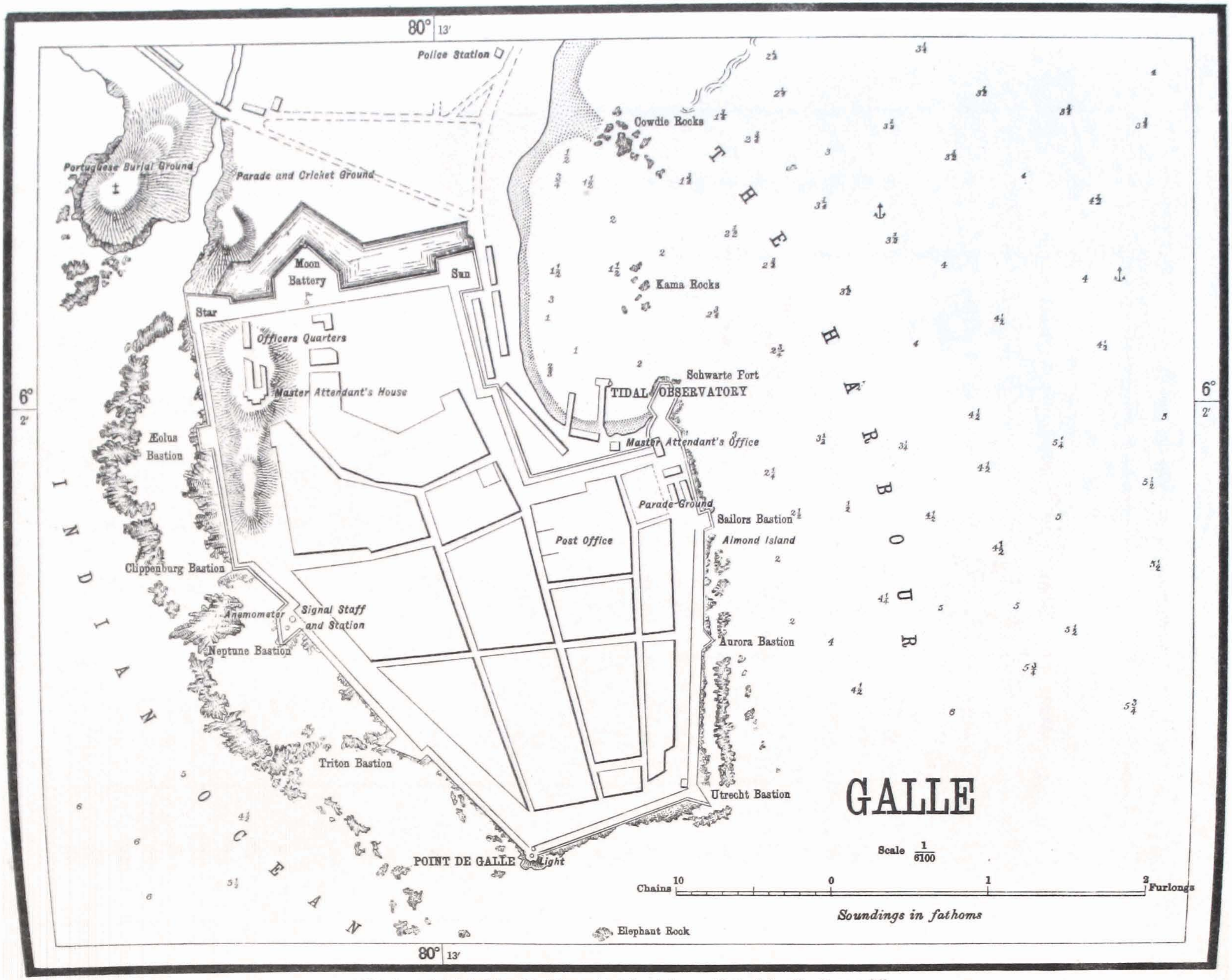
In 1891-92 the mean range of largest ordinary springs was found to be 4·0 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1891-92	5·174 feet.
1892-93	5·269 „

Values of H's *and* κ's *at Minicoy.*

Tide	H		κ		Tide
	1891-92	1892-93	1891-92	1892-93	
	Feet	Feet	°	°	
S_1	0·037	0·061	209·86	198·35	S_1
S_2	·360	·332	18·83	21·74	S_2
S_4	·003	·001	128·05	12·10	S_4
S_6	·001	·001	170·54	291·80	S_6
S_8	·000	·001	213·69	145·01	S_8
M_1	·032	·020	25·56	37·76	M_1
M_2	·880	·835	327·78	331·97	M_2
M_3	·007	·003	175·36	188·30	M_3
M_4	·011	·004	17·91	170·60	M_4
M_6	·004	·001	105·81	39·77	M_6
M_8	·002	·003	138·95	244·83	M_8
O	·338	·327	58·49	59·70	O
K_1	·695	·682	49·76	52·24	K_1
K_2	·096	·093	11·14	24·41	K_2
P	·224	·226	47·35	45·78	P
J	·065	·035	76·08	82·20	J
Q	·075	·055	63·23	60·35	Q
L	·021	·039	18·49	14·84	L
N	·180	·172	300·67	304·38	N
λ	...	...	...	...	λ
ν	·058	·071	316·76	283·64	ν
μ	·005	·016	278·79	273·15	μ
R	...	...	...	...	R
T	...	·034	...	321·76	T
MS	·005	·011	127·36	299·28	MS
2SM	·002	·004	305·83	315·38	2SM
2N	·024	·014	246·19	240·01	2N
M_2N	·015	·051	223·52	261·03	M_2N
M_2K_1	·008	·005	45·51	236·16	M_2K_1
$2M_2K_1$	·002	·004	207·90	263·25	$2M_2K_1$
Mm	·032	·039	68·31	146·97	Mm
Mf	·063	·054	10·86	357·04	Mf
MSf	·011	·016	55·56	49·93	MSf
Sa	·369	·283	355·19	358·24	Sa
Ssa	·106	·170	273·92	228·86	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, January 1898.

GALLE.

(Tidal Observatory, Lat. 6° 2′ N., Long. 80° 13′ E.)

The tidal observatory at Galle, near the southern extremity of the west coast of Ceylon, was one of the minor observatories at which five years' observations are generally considered sufficient, and was situated in the angle formed by the T-head of the end of the landing pier, in the position shown on the accompanying chart. It was a small wooden cabin having its floor on a level with that of the pier and isolated from it, and was supported on four piles protected by copper sheathing from the action of the water. The float-cylinder was twenty-two inches in diameter and eleven feet long, formed in two sections. The lower section, nine feet long, was of iron and rested on the bed of the harbour which is about three and a half feet below lowest tides: the upper, two feet long, was of wood and had its top on a level with the floor of the observatory, about three feet above highest tides. The communication was through two small holes near the bottom of the cylinder.

The working scale of the tide-gauge was the natural scale.

Registrations were commenced on the 23rd March, 1884. In September of the same year rough weather displaced the cylinder, and caused about a fortnight's interruption to the observations. The water was found to have a very corrosive action on the iron of the cylinder. Holes due to this cause began to appear, and in July of the following year the cylinder had to be repaired at the cost of a week's break in the observations. In December, 1886, the cylinder had become useless through corrosion and there was a month's break in the observations while it was being renewed. After this, for nearly two years, the registrations were satisfactory, but between November, 1888, and June, 1889, they suffered many short interruptions due to various causes, and the curves for about nine weeks preceding the latter date (owing to the corrosion of the bottom of the cylinder and the consequent excessive flow of water through openings so made) were rendered difficult to read from the great oscillation of the pencil. It was considered expedient to extend the observations to the 8th April, 1890, when the observatory was dismantled after having been in operation for six years.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory. The anemometer after being at work for a year on the top of the same building was removed to the top of the signal house on the southern rampart of the Fort, a much better position for it.

The bench-mark of reference is a stone embedded in a block of masonry and inscribed G.T.S. □ B.M. A.D. 1884.; it is situated four feet outside the Fort-wall and nine feet east of the northern gateway through which the road from the landing-pier enters the Fort, and on the wall of the Fort just opposite the bench-mark, the inscription G.T.S. B.M. has been cut. The bench-mark is 7·710 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $II^h\ 3^m$.

The highest high water recorded was 4·9 feet above the zero of the gauge, and occurred in December, 1889.

The lowest low water recorded was 0·7 foot above the zero of the gauge, and occurred in July, 1886.

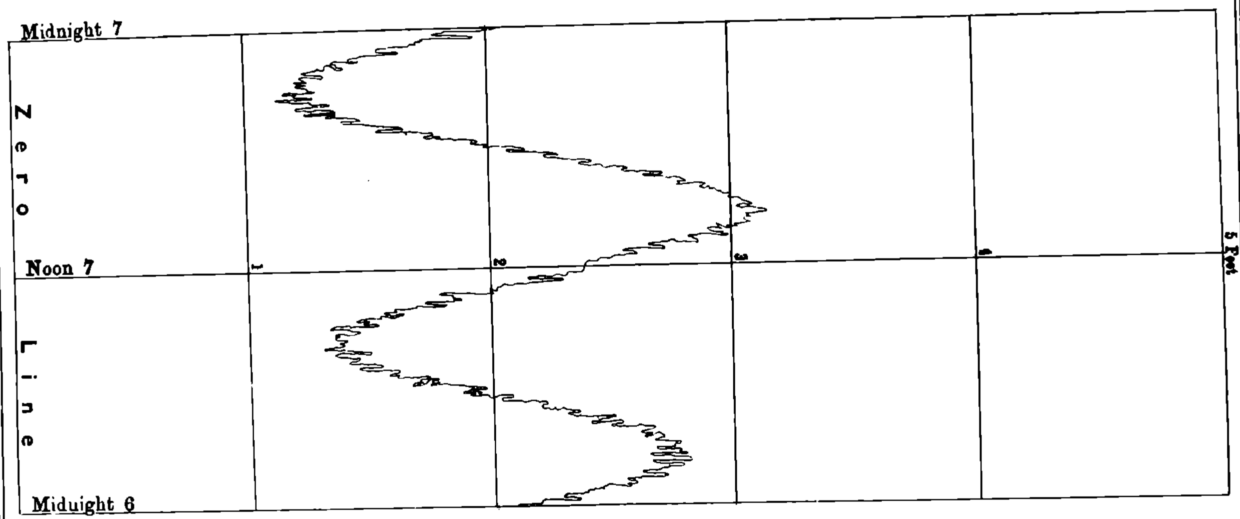
In 1889 the mean range of largest ordinary springs was 2·3 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1884-85	2·656 feet.
1885-86	2·700 „
1886-87	2·679 „
1887-88	2·606 „
1888-89	2·570 „
1889-90	2·685 „

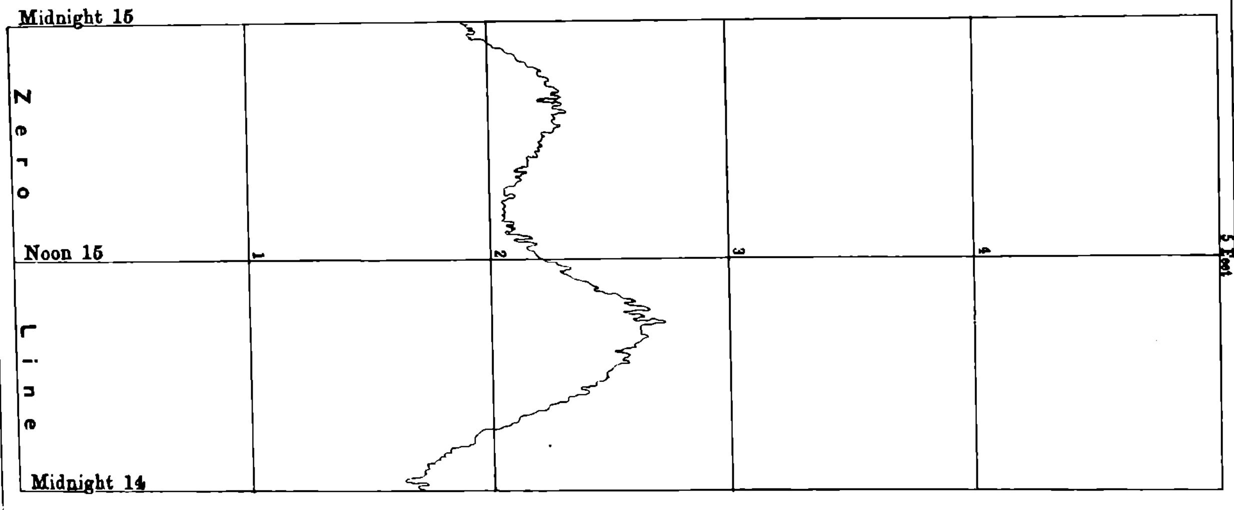
TIDAL CURVES
at
GALLE

Spring Tide —— 7th August 1884



Full Moon —— 6th August 1884

Neap Tide —— 15th August 1884



Last Quarter —— 14th August 1884

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. September 1900.

Reg. No. D.513. S. I. D.-Febv. 1900-500

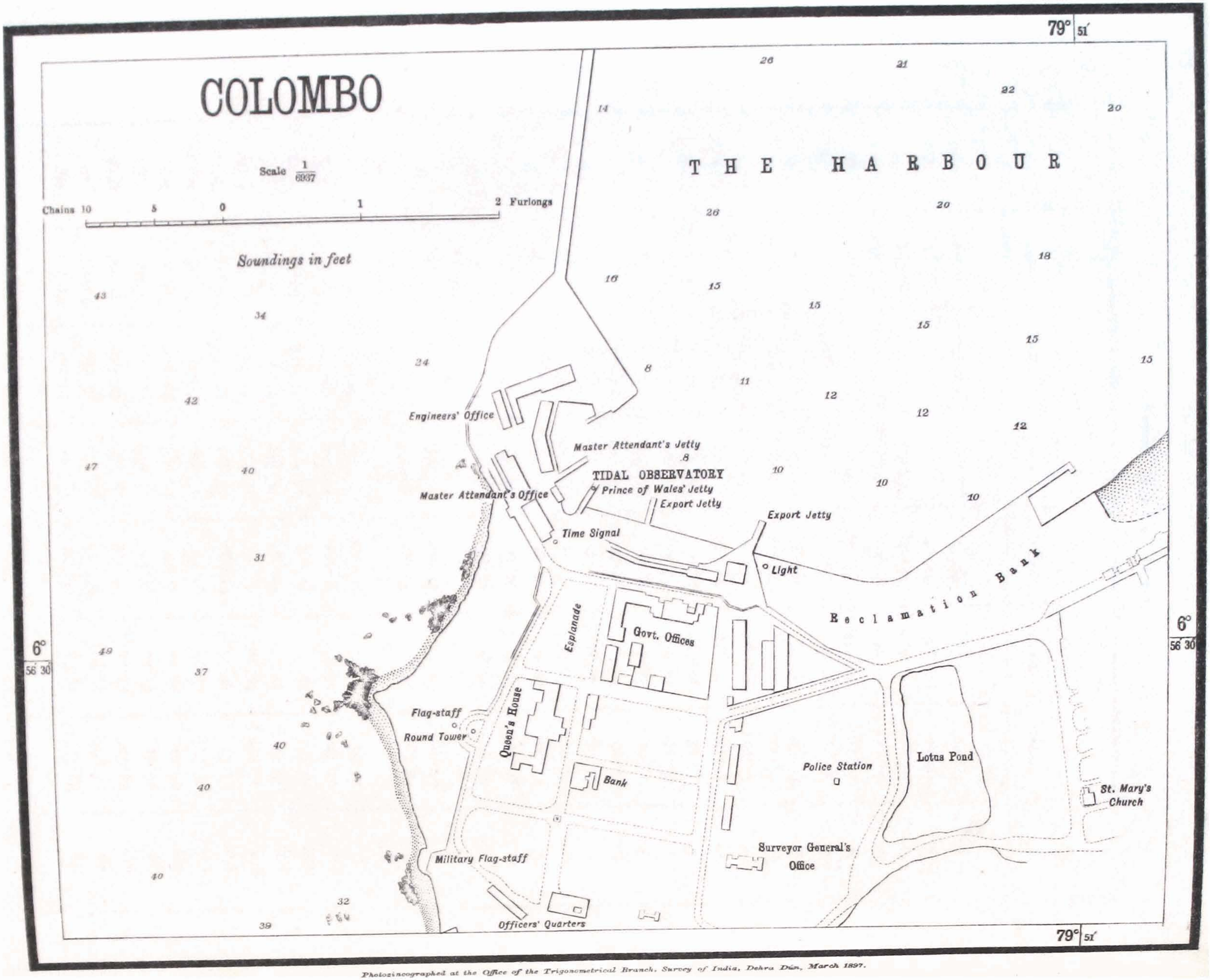
Values of H's *at Galle.*

Tide	H						Tide
	1884-85	1885-86	1886-87	1887-88	1888-89	1889-90	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·011	0·012	0·031	0·011	0·012	0·011	S_1
S_2	·357	·357	·370	·369	·358	·361	S_2
S_4	·002	·004	·002	·003	·004	·003	S_4
S_6	·001	·000	·004	·001	·001	·000	S_6
S_8	·001	·001	·001	·001	·003	·001	S_8
M_1	·010	·008	·004	·007	·007	·003	M_1
M_2	·526	·525	·530	·524	·527	·531	M_2
M_3	·014	·012	·014	·012	·013	·010	M_3
M_4	·009	·011	·013	·014	·015	·012	M_4
M_6	·004	·003	·003	·002	·002	·002	M_6
M_8	·002	·002	·001	·001	·001	·002	M_8
O	·044	·052	·046	·049	·049	·041	O
K_1	·165	·165	·168	·170	·166	·166	K_1
K_2	·093	·089	·154	·115	·098	·108	K_2
P	·053	·049	·037	·043	·053	·046	P
J	·010	·006	·012	·013	·008	·010	J
Q	·023	·024	·028	·030	·024	·025	Q
L	·036	·028	·042	·029	·024	·020	L
N	·053	·066	·054	·060	·072	·071	N
λ	·018	·012	...	...	...	...	λ
ν	·048	·038	·013	·005	·028	·030	ν
μ	·025	·025	·026	·020	·024	·021	μ
R	...	·018	...	...	...	...	R
T	...	·041	...	·016	·039	·024	T
MS	·006	·006	·009	·007	·007	·005	MS
2SM	·007	·012	·008	·007	·009	·012	2SM
2N	·007	·020	·009	·009	·004	·009	2N
M_2N	·026	·013	·024	·014	·017	·016	M_2N
M_2K_1	·005	·008	·005	·004	·002	·002	M_2K_1
$2M_2K_1$	·002	·001	·003	·004	·006	·007	$2M_2K_1$
Mm	·067	·017	·017	·058	·035	·038	Mm
Mf	·020	·027	·066	·073	·030	·012	Mf
MSf	·013	·013	·030	·028	·013	·020	MSf
Sa	·377	·287	·346	·371	·324	·392	Sa
Ssa	·097	·089	·142	·096	·178	·159	Ssa

Values of κ's at Galle.

Tide	κ						Tide
	1884-85	1885-86	1886-87	1887-88	1888-89	1889-90	
	°	°	°	°	°	°	
S_1	65·77	74·88	27·87	34·29	63·02	13·64	S_1
S_2	96·56	93·95	91·80	92·94	93·51	96·40	S_2
S_4	205·20	245·56	252·65	241·93	213·28	248·96	S_4
S_6	264·29	135·00	106·14	26·57	296·57	206·57	S_6
S_8	196·70	258·69	274·09	296·57	322·70	261·87	S_8
M_1	225·42	245·42	332·67	349·16	3·06	64·08	M_1
M_2	59·80	57·32	54·95	54·56	55·76	58·93	M_2
M_3	166·23	161·03	149·98	157·80	159·14	174·32	M_3
M_4	171·06	164·32	166·44	161·51	162·32	159·44	M_4
M_6	1·98	335·69	24·27	302·84	270·57	31·23	M_6
M_8	284·91	211·54	255·33	138·67	235·43	31·38	M_8
O	78·75	79·25	78·47	73·81	70·95	72·20	O
K_1	19·87	17·59	15·66	18·82	17·83	19·61	K_1
K_2	91·99	104·40	100·97	90·42	88·95	94·72	K_2
P	26·58	14·67	24·19	20·42	19·87	23·91	P
J	68·55	53·28	355·41	16·93	57·87	22·11	J
Q	88·84	95·68	94·72	91·11	104·02	104·13	Q
L	67·31	6·56	79·98	25·77	75·28	32·98	L
N	47·26	41·97	44·77	44·58	46·38	53·69	N
λ	100·75	17·88	...	...	...	...	λ
ν	66·52	16·39	351·33	160·33	82·39	46·46	ν
μ	101·82	106·19	100·12	98·93	102·90	87·81	μ
R	...	357·83	...	...	...	...	R
T	...	58·79	...	103·36	72·91	39·43	T
MS	312·74	240·89	238·24	236·91	258·86	243·16	MS
2SM	23·69	340·19	319·94	306·21	4·55	7·54	2SM
2N	208·91	66·21	148·64	70·24	171·42	49·31	2N
M_2N	164·87	228·78	189·31	250·29	181·64	258·78	M_2N
M_2K_1	284·39	28·48	126·55	165·12	10·48	5·73	M_2K_1
$2M_2K_1$	135·25	95·67	82·31	14·46	11·38	335·54	$2M_2K_1$
Mm	21·93	337·01	339·95	42·49	22·06	42·16	Mm
Mf	12·20	38·74	338·73	12·56	55·13	17·96	Mf
MSf	324·41	133·17	267·51	212·44	47·40	213·83	MSf
Sa	314·15	330·35	311·78	297·53	304·80	296·59	Sa
Ssa	124·75	102·12	121·83	125·34	84·63	135·85	Ssa

COLOMBO



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, March 1897.

COLOMBO.

(*Tidal Observatory, Lat. 6° 57′ N., Long. 79° 51′ E.*)

The tidal observatory at Colombo, on the west coast of Ceylon, was one of the minor observatories at which five years' observations are generally considered sufficient, and was situated over the small water-space between the end of the Import Jetty and the masonry pedestal of the large crane in front of the Master Attendant's and Customs Offices, in the position shown on the accompanying chart. It was the wooden cabin previously used at Pámban, but reduced in size to fit the rather cramped space available for its reception. It was fixed on substantial cross beams each of which rested at first with one of its ends on the beams of the Jetty and the other inserted in the pedestal of the crane; but after a year's trial it was found necessary to isolate the observatory as the shocks caused by boats striking against the Jetty stopped the driving clock. Piles were therefore driven to act as supports in lieu of the Jetty, and the cross beams were securely fixed to them and into the pedestal of the crane, an arrangement which was found to give the necessary stability. The float-cylinder was of iron, twenty-two inches in diameter and eleven feet long. Its top projected about six inches above the floor of the observatory and was four feet above the highest tides; and its bottom, which was closed, rested on stones laid on the bed of the harbour, and was two and a half feet below the lowest tides. The communication was at first through a hole, covered with a perforated copper nozzle, close to the bottom of the cylinder. After trial for about a year and a half this arrangement had to be discarded as the pencil was found to oscillate to such an extent as to make the tidal curves almost illegible. In lieu of it, a short external pipe in two pieces and bent downwards was fitted to the hole. Its lower piece was fitted within with a wooden block having a half-inch tube passing through its centre, at the top and bottom of which a rose was attached. This arrangement made the curves legible; but it was troublesome, as the pipe frequently became choked, and retardation was caused.

The working scale of the tide-gauge was the natural scale.

Registrations were commenced on the 24th January, 1884. In September of the same year about a fortnight's observations had to be rejected owing to retardation. For a similar reason the curves between the 1st November and 5th December, 1885, and those between the 21st October and 18th November, 1889, had also to be rejected—otherwise the registrations may be considered satisfactory. The observatory was closed on the 29th March, 1890, after a period of six years' observations, it being found convenient to close both the Colombo and Galle tidal observatories about the same time.

Barometrical and anemometrical observations were not taken, as the Colombo meteorological statistics are obtainable from the Surveyor General of Ceylon.

The bench-mark of reference is a stone engraved G. T. S. □ B. M. embedded six inches under ground in a block of masonry, close under the outer wall of the double flight of steps leading (on the Harbour side) to the Customs House and Master Attendant's Office, and ten and a half feet east of the lowest step of the western flight. Just above the bench-mark there is a slab of cement let into the wall bearing the inscription G. T. S. B. M. Below. The bench-mark is 10·075 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $I^h\ 50^m$.

The highest high water recorded was 4·4 feet above the zero of the gauge, and occurred in October, 1886.

The lowest low water recorded was 0·3 foot above the zero of the gauge, and occurred in September, 1888.

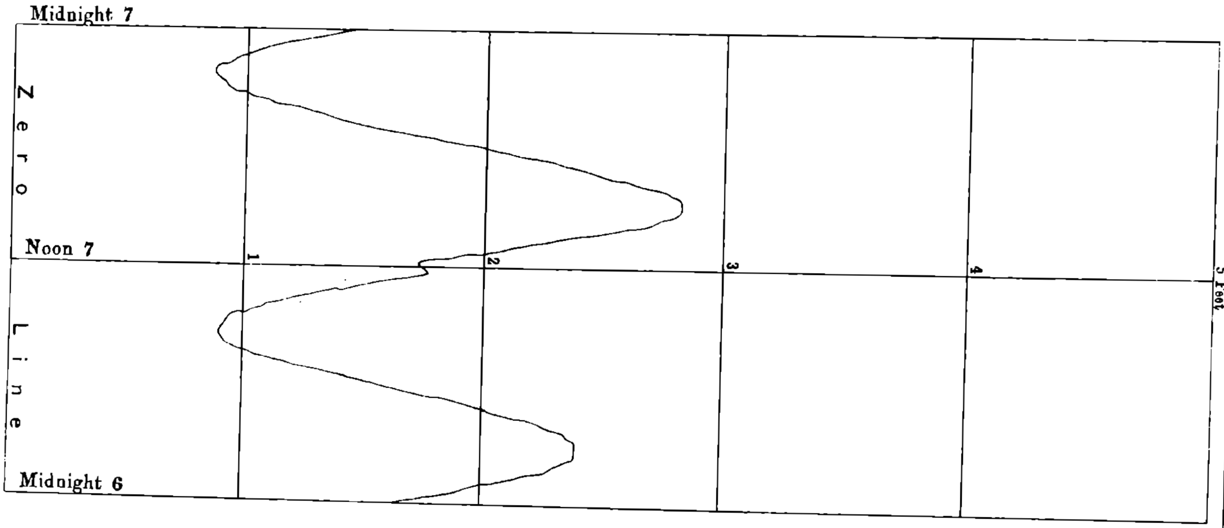
In 1889-90 the mean range of largest ordinary springs was found to be 2·6 feet.

The height of mean-sea-level above the zero of the gauge had the following values :—

1884-85	2·208 feet.
1885-86	2·261 „
1886-87	2·304 „
1887-88	2·199 „
1888-89	2·112 „
1889-90	2·216 „

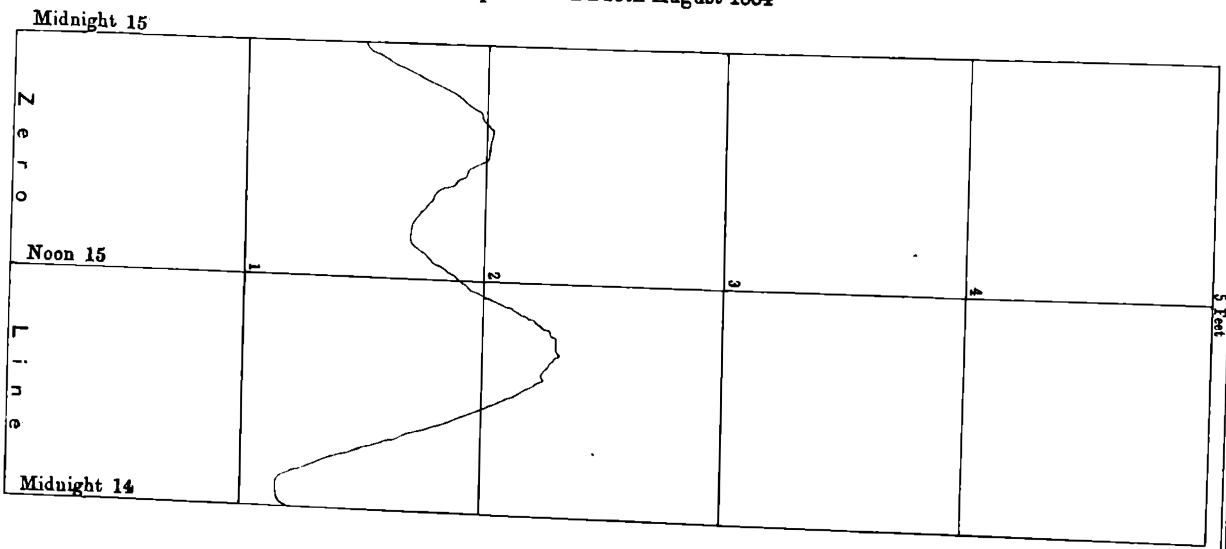
TIDAL CURVES
at
COLOMBO

Spring Tide ——— 7th August 1884



Full Moon ——— 6th August 1884

Neap Tide ——— 15th August 1884



Last Quarter ——— 14th August 1884

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dūn, September 1900.

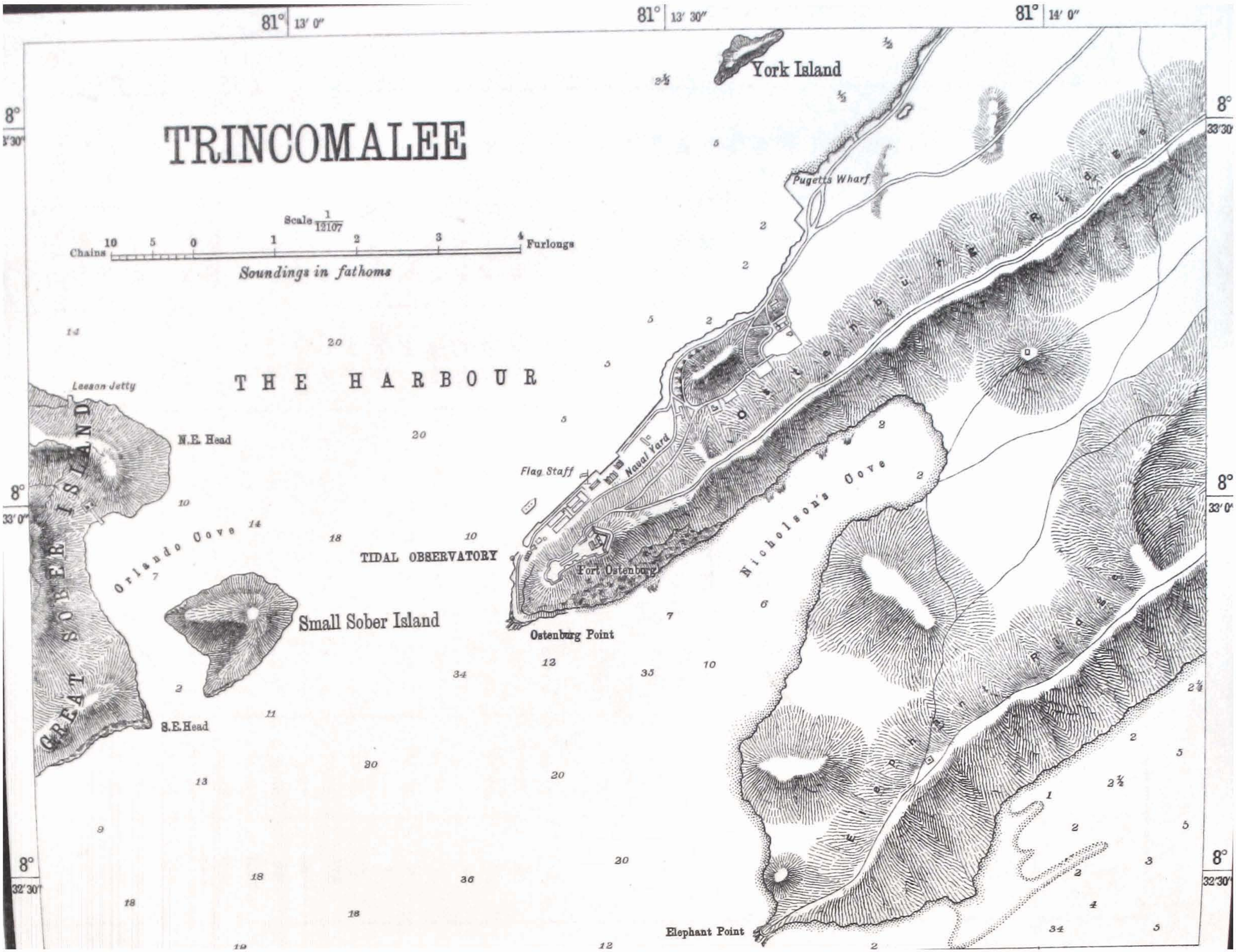
Regr. No. D. 603, S. I. D. - Mar. 1900—500

Values of H's *at Colombo.*

Tide	H 1884-85	1885-86	1886-87	1887-88	1888-89	1889-90	Tide
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·018	0·030	0·003	0·006	0·004	0·016	S_1
S_2	·362	·389	·404	·404	·392	·394	S_2
S_4	·004	·004	·004	·006	·005	·005	S_4
S_6	·002	·002	·002	·001	·002	·002	S_6
S_8	·001	·001	·000	·000	·000	·001	S_8
M_1	·008	·013	·006	·007	·015	·014	M_1
M_2	·546	·563	·590	·593	·596	·586	M_2
M_3	·015	·015	·014	·016	·012	·016	M_3
M_4	·015	·014	·017	·018	·017	·018	M_4
M_6	·002	·003	·005	·004	·004	·004	M_6
M_8	·000	·001	·000	·001	·001	·001	M_8
O	·093	·101	·091	·092	·098	·091	O
K_1	·237	·231	·239	·240	·240	·238	K_1
K_2	·072	·104	·126	·115	·127	·105	K_2
P	·082	·062	·068	·066	·071	·081	P
J	·030	·006	·013	·022	·017	·008	J
Q	·029	·027	·031	·036	·035	·031	Q
L	·028	·018	·038	·028	·035	·016	L
N	·063	·050	·073	·075	·085	·090	N
λ	·024	·032	·016	...	...	...	λ
ν	·023	·014	·011	·022	·021	·017	ν
μ	·020	·017	·018	·016	·019	·014	μ
R	...	·059	...	...	...	...	R
T	...	·041	...	·014	·033	·047	T
MS	·005	·008	·009	·009	·010	·012	MS
2SM	·008	·005	·008	·005	·007	·014	2SM
2N	·011	·012	·008	·015	·008	·008	2N
M_2N	·031	·014	·009	·013	·027	·037	M_2N
M_2K_1	·004	·002	·007	·009	·010	·001	M_2K_1
$2M_2K_1$	·005	·002	·005	·005	·005	·005	$2M_2K_1$
Mm	·043	·035	·040	·028	·051	·026	Mm
Mf	·033	·064	·049	·066	·015	·030	Mf
MSf	·014	·012	·026	·025	·010	·016	MSf
Sa	·328	·267	·323	·331	·276	·353	Sa
Ssa	·123	·060	·155	·105	·190	·165	Ssa

Values of κ's at Colombo.

Tide	κ 1884-85	1885-86	1886-87	1887-88	1888-89	1889-90	Tide
	°	°	°	°	°	°	
S_1	61·68	59·87	142·77	358·09	62·85	61·63	S_1
S_2	99·60	101·28	90·30	92·48	94·11	94·34	S_2
S_4	211·50	248·46	225·94	218·33	247·38	265·60	S_4
S_6	188·53	214·38	144·16	148·00	195·95	170·13	S_6
S_8	236·31	105·95	108·44	108·44	291·80	172·03	S_8
M_1	56·56	192·29	288·84	15·35	347·82	340·92	M_1
M_2	52·78	54·04	45·83	46·95	51·14	48·40	M_2
M_3	169·49	166·04	161·36	168·12	170·48	181·62	M_3
M_4	179·76	174·19	164·55	171·35	167·93	164·14	M_4
M_6	76·27	62·83	346·03	1·97	5·30	27·83	M_6
M_8	54·23	228·21	145·52	107·37	227·24	87·71	M_8
O	64·30	67·36	59·23	62·03	60·76	58·25	O
K_1	35·72	35·67	29·26	30·70	33·48	31·77	K_1
K_2	108·98	82·45	84·74	90·42	93·12	81·39	K_2
P	34·05	11·86	29·87	27·72	36·65	17·12	P
J	36·95	59·88	1·80	26·24	50·47	45·03	J
Q	80·79	88·34	81·74	86·57	90·82	99·45	Q
L	53·79	46·01	64·41	27·22	54·67	57·11	L
N	28·53	46·72	29·94	31·09	33·40	31·44	N
λ	59·07	55·85	16·40	...	...	...	λ
ν	39·47	49·84	76·34	47·53	22·13	11·07	ν
μ	105·63	96·51	122·45	111·12	108·33	82·94	μ
R	...	339·70	...	...	...	...	R
T	...	353·08	...	117·48	77·94	27·24	T
MS	258·28	267·88	260·33	237·22	243·94	251·55	MS
2SM	279·95	348·65	357·28	321·69	334·31	5·41	2SM
2N	50·96	122·83	15·61	91·58	342·25	79·30	2N
M_2N	252·45	256·23	262·00	306·29	281·20	280·19	M_2N
M_2K_1	154·35	107·03	27·42	91·86	140·40	174·28	M_2K_1
$2M_2K_1$	181·94	83·42	86·55	49·39	355·63	314·72	$2M_2K_1$
Mm	18·39	321·39	23·98	76·28	16·47	67·06	Mm
Mf	320·88	13·97	343·51	22·76	65·08	304·32	Mf
MSf	35·96	60·25	274·83	280·39	261·77	277·82	MSf
Sa	308·75	326·88	314·71	298·52	303·70	296·17	Sa
Ssa	128·39	83·27	121·94	116·65	88·52	130·01	Ssa


TRINCOMALEE
Scale 1/12107
Chains
Furlongs
Soundings in fathoms
THE HARBOUR
York Island
Pugetts Wharf
Naval Yard
Flag Staff
Fort Ostenburg
Ostenburg Point
Nicholson's Cove
TIDAL OBSERVATORY
Small Sober Island
Orlando Cove
Lesson Jetty
N.E. Head
S.E. Head
GREAT SOBER ISLAND
Elephant Point
Ostenburg Ridge
Elephant Ridge

TRINCOMALEE.

(Tidal Observatory, Lat. 8° 33′ N., Long. 81° 13′ E.)

The tidal observatory at Trincomalee, on the north-east coast of Ceylon, is one of the minor observatories at which five years' observations are considered sufficient, and is situated on the small stone wharf at the south end of the Naval Dockyard on the east side of Trincomalee Harbour, in the position shewn on the accompanying chart. It is twelve feet square, with wooden walls and a tiled roof. Half the building rests on the wharf wall, to which it is secured by iron bolts, while the other half, which projects beyond the wharf, is supported by three iron struts thrown out from the wall. The float-cylinder is a massive iron drainage pipe twenty inches in internal diameter and twelve and a half feet long. Its top rises one foot four inches above the floor of the observatory, and is three feet above the highest tides; and the bottom, which is closed with an iron-wood plug, is five and a half feet below the lowest tides, and rests on three stout iron pegs driven into the bed of the harbour above which they project about nine inches. The communication is through five perforations (each an inch in diameter) in the iron-wood plug at the bottom of the cylinder.

The working sçale of the tide-gauge is the natural scale.

Registrations were commenced on the 10th November, 1890, and have been very satisfactory up to the present.

Barometrical and anemometrical observations are being carried on simultaneously with the tidal observations. The barometer has been set up in the tidal observatory. The anemometer was at first on the roof of the same building and worked there until the 9th March, 1893, when it was removed to the top of Fort Ostenburg immediately above the Dockyard, a much better position as it is exposed to the wind from every quarter, whereas the tidal observatory is much shut in.

The bench-mark of reference is on a large stone in the wharf wall of the Naval Dockyard, twenty-five feet from the tidal observatory door, bearing the inscription G. T. S. A.□ B. M. 1890. It is 5·900 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $IX^h\ 23^m$.

The highest high water recorded was 4·3 feet above the zero of the gauge, and occurred in November, 1892.

The lowest low water recorded was 0·2 foot above the zero of the gauge, and occurred in March, 1892.

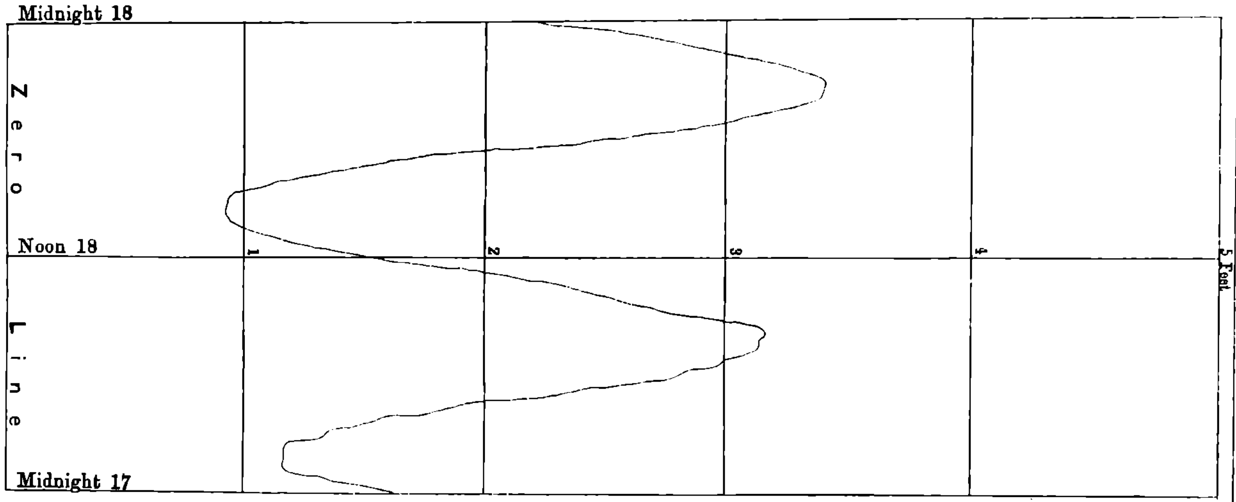
In 1890-91 the mean range of largest ordinary springs was found to be 2·1 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1890-91	1·842 feet.
1891	1·826 „
1892	2·043 „

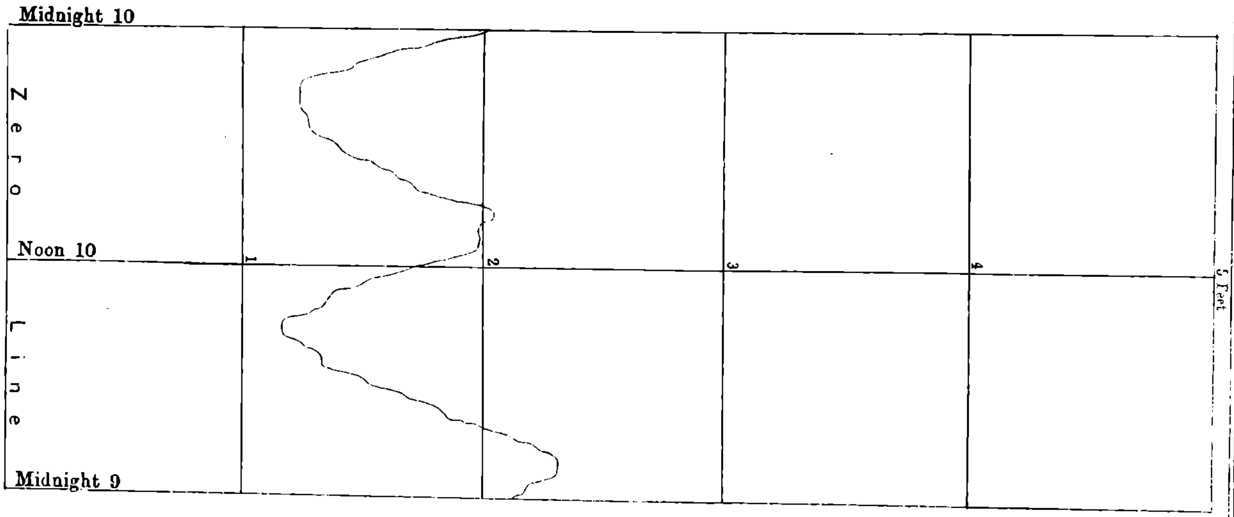
TIDAL CURVES
at
TRINCOMALEE

Spring Tide — 18th October 1891



Full Moon — 17th October 1891

Neap Tide — 10th October 1891



First Quarter — 10th October 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, September 1900.

Regr. No. D. 291, S. [illegible] July 1900—600

Values of H's *and* κ's *at Trincomalee.*

Tide	H 1890-91	H 1891	H 1892	κ 1890-91	κ 1891	κ 1892	Tide
	Feet	Feet	Feet	°	°	°	
S_1	0·018	0·020	0·015	65·25	64·86	55·11	S_1
S_2	·191	·192	·208	269·31	264·50	266·49	S_2
S_4	·007	·006	·003	251·57	258·89	272·05	S_4
S_6	·000	·001	·001	45·00	48·37	167·47	S_6
S_8	·001	·001	·000	323·13	336·80	26·57	S_8
M_1	·008	·007	·006	4·92	23·99	305·74	M_1
M_2	·587	·591	·621	240·15	242·08	237·86	M_2
M_3	·004	·001	·005	194·03	340·82	124·92	M_3
M_4	·013	·012	·009	224·67	258·82	238·27	M_4
M_6	·006	·006	·002	108·71	115·51	112·73	M_6
M_8	·002	·003	·001	159·61	82·72	214·69	M_8
O	·062	·064	·064	307·58	308·31	307·40	O
K_1	·211	·211	·213	330·86	331·61	330·97	K_1
K_2	·072	·079	·065	249·29	264·36	265·33	K_2
P	·074	·076	·068	343·26	340·21	330·02	P
J	·020	·019	·011	279·21	273·03	300·91	J
Q	·011	·009	·009	177·27	192·95	212·39	Q
L	·053	·058	·067	308·76	332·51	248·78	L
N	·144	·147	·127	227·80	224·76	226·30	N
λ	...	...	...	...	...	...	λ
ν	·048	·054	·059	208·88	245·16	200·29	ν
μ	·033	·037	·039	160·13	165·91	163·28	μ
R	...	...	...	...	...	...	R
T	...	·056	·050	...	187·56	239·26	T
MS	·010	·013	·011	189·70	198·21	212·41	MS
2SM	·010	·007	·024	248·07	231·97	248·23	2SM
2N	·024	·020	·043	231·60	195·37	238·47	2N
M_2N	·007	·007	·028	322·30	245·28	84·55	M_2N
M_2K_1	·008	·005	·008	197·68	213·45	280·69	M_2K_1
$2M_2K_1$	·005	·005	·005	21·62	14·11	141·01	$2M_2K_1$
Mm	·023	·031	·067	330·72	338·68	135·61	Mm
Mf	·055	·050	·055	14·54	19·54	4·26	Mf
MSf	·015	·012	·009	235·75	266·46	237·18	MSf
Sa	·291	·266	·255	281·40	287·80	231·24	Sa
Ssa	·207	·165	·169	133·69	139·70	122·30	Ssa

PÁMBAN.

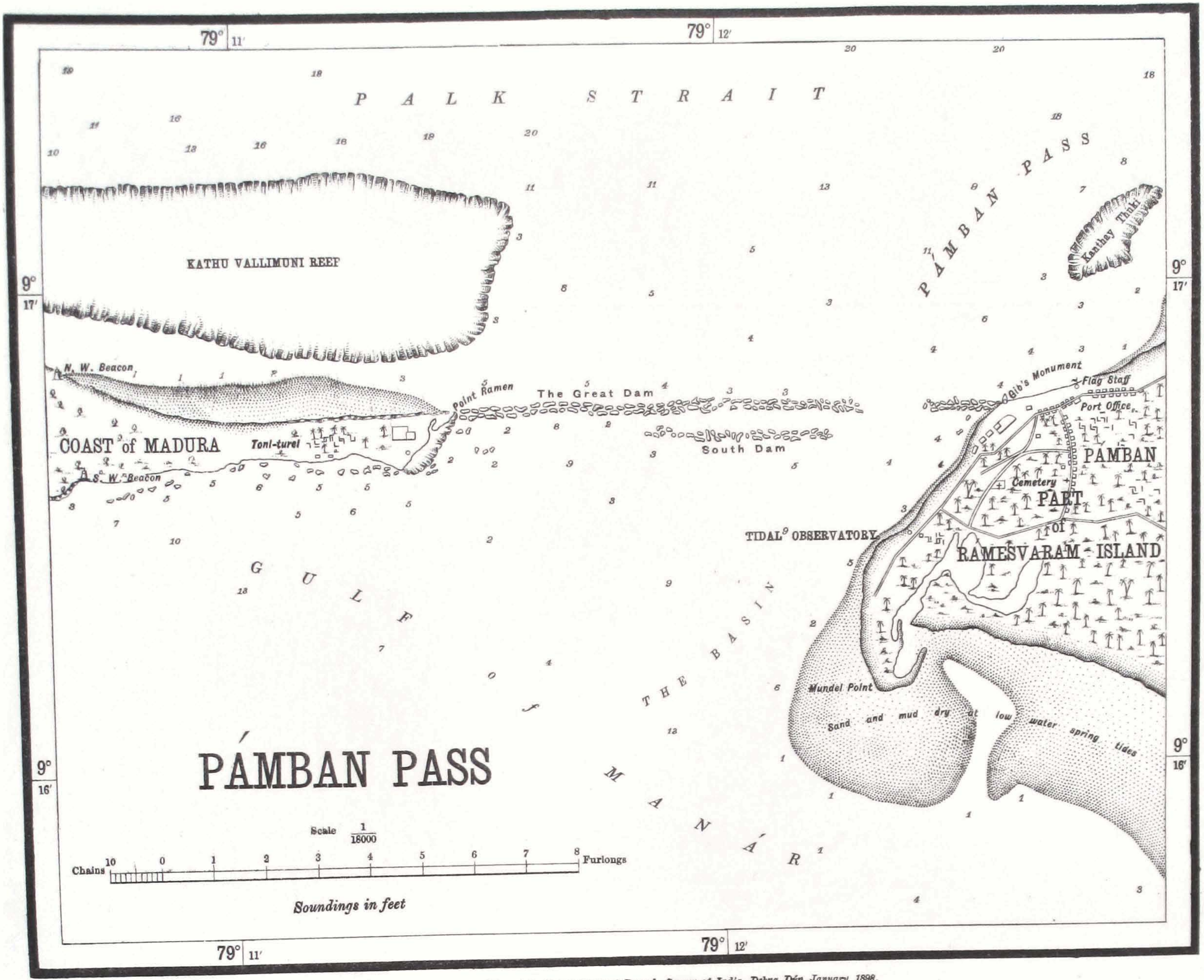
(PÁMBAN PASS.)

(Tidal Observatory, Lat. 9° 16′ N., Long. 79° 12′ E.)

Pámban Pass is the channel connecting the Gulf of Manar and Palk Straits, and separating the island of Rámesvaram (adjoining it on the east) from a remarkable, straight reef of rocks (immediately on its west) called the Great Dam, which extends westwards for a mile and a quarter and then joins the coast of India at the point known as Toni-turei. The tidal observatory was situated on the western shore of Rámesvaram, about half a mile south of the town of Pámban and a hundred yards south of the Telegraph Cable House, in the position shown on the accompanying chart, and was one of the minor observatories at which five years' observations are considered sufficient. It was a wooden cabin, twelve feet square, supported on six piles driven about five feet into the sand, and having its floor well above high water. The float-cylinder was of iron, twenty-two inches in diameter and nine feet long. The top was about a foot above the floor of the observatory and about two feet above highest tides, and the bottom (which was closed) was sunk in the sand and was about three feet below lowest tides. The communication was through a two-inch pipe, eighty-one feet in length, and bent so as to form a siphon, the first fifty-six feet of it being iron piping and the outer twenty-five feet being flexible tubing. The short branch left the cylinder about one and a half feet above the bottom and rose about three feet vertically to a point where an air cock was placed at about mean-sea-level; from this point the pipe sloped downwards into deep water and ended, about ten feet below the lowest tides, in a rose supported on a tripod.

The working scale of the tide-gauge was the natural scale.

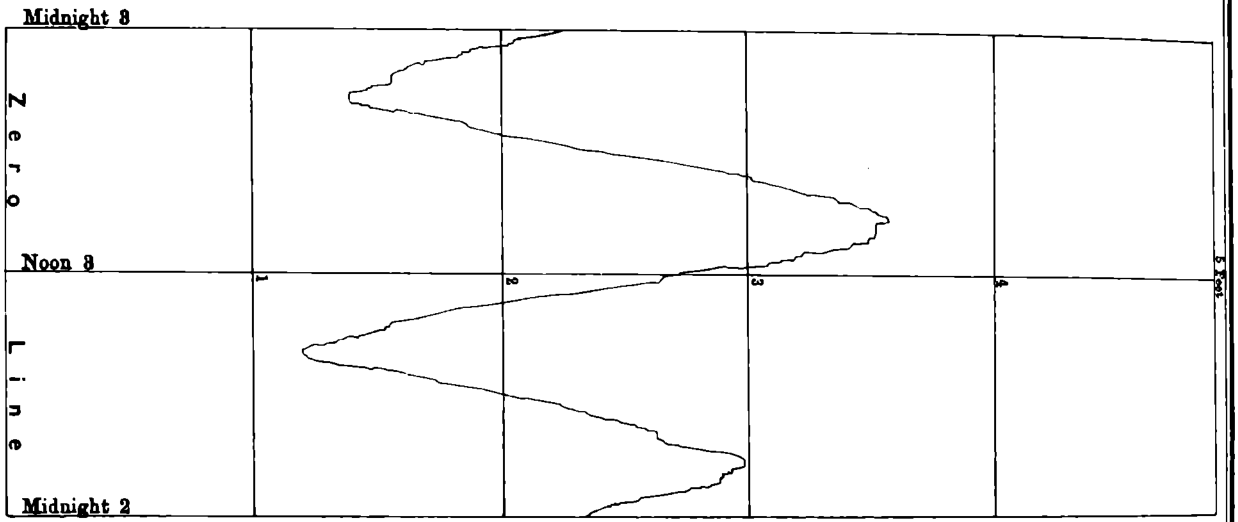
Registrations were commenced on the 1st October, 1878. In December of the same year, during bad weather, the piles of the observatory were denuded of their supporting sand, but prompt measures being taken, no interruption occurred. In January, February and March, 1880, air got into the communication pipe through the packing round the joints and caused a small amount of retardation. In 1881



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. January 1898.

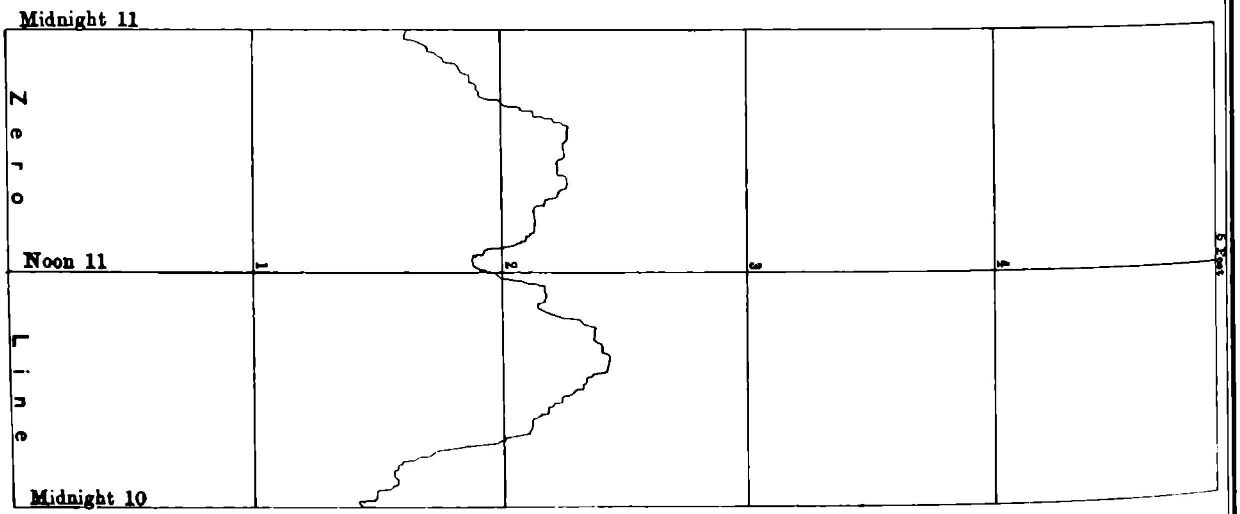
TIDAL CURVES
at
PÁMBAN PASS

Spring Tide —— 3rd August 1879



Full Moon —— 2nd August 1879

Neap Tide —— 11th August 1879



Last Quarter —— 10th August 1879

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, September 1900.

there were several short stoppages caused by accidents to various parts of the mechanism of the tide-gauge: and finally, in February, 1882, parts of the communication pipe having been eaten into holes had to be renewed thus causing an interruption of work for three days. The observations were continued until the 28th December, 1882, when heavy weather endangered the safety of the observatory, and the instruments had to be removed. The necessary strengthening of the observatory would have caused a large break in the fifth year's observations, and as four years' satisfactory registrations had been obtained it was not thought necessary to extend the observations further. The disturbances of the surface of the ocean caused by an earthquake whose centre lay between Port Blair and Car Nicobar were recorded at this station by the self-registering tide-gauge on the 31st December, 1881.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference is a stone embedded in a block of masonry close to the western wall of the Telegraph Cable House and marked G.T.S. □ B.M. A. It is 10·18 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $I^h\ 48^m$.

The highest high water recorded was 4·8 feet above the zero of the gauge, and occurred in December, 1880.

The lowest low water recorded was 0·9 foot above the zero of the gauge, and occurred in August, 1880.

In 1878-79 the mean range of largest ordinary springs was found to be 2·6 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1878-79	2·666 feet.
1879-80	2·707 ,,
1880-81	2·759 ,,
1881-82	2·705 ,,

Values of H's *at Pámban.*

Tide	H				Tide
	1878-79	1879-80	1880-81	1881-82	
	Feet	Feet	Feet	Feet	
S_1	0·036	0·049	0·035	0·022	S_1
S_2	·377	·375	·377	·360	S_2
S_4	·005	·001	·004	·003	S_4
S_6	·002	·001	·005	·006	S_6
S_8	·004	·005	·002	·001	S_8
M_1	·013	·009	·013	·008	M_1
M_2	·589	·585	·598	·569	M_2
M_3	·016	·016	·015	·017	M_3
M_4	·020	·016	·015	·014	M_4
M_6	·011	·011	·011	·009	M_6
M_8	·005	·004	·004	·007	M_8
O	·114	·113	·116	·115	O
K_1	·297	·293	·295	·291	K_1
K_2	·103	·110	·116	·121	K_2
P	·105	·110	·108	·115	P
J	·008	·013	·014	·021	J
Q	·025	·021	·023	·016	Q
L	·023	·026	·016	·026	L
N	·076	·087	·084	·082	N
λ	·017	·023	·008	·014	λ
ν	·016	·034	·030	·027	ν
μ	·004	·010	·012	·011	μ
R	...	·012	...	·019	R
T	...	·038	...	·012	T
MS	·021	·017	·018	·017	MS
2SM	·010	·008	·012	·008	2SM
2N	·003	·015	·008	·008	2N
M_2N	·022	·023	·013	·015	M_2N
M_2K_1	·005	·005	·007	·001	M_2K_1
$2M_2K_1$	·003	·007	·007	·008	$2M_2K_1$
Mm	·063	·053	·033	·043	Mm
Mf	·045	·040	·053	·033	Mf
MSf	·016	·013	·027	·007	MSf
Sa	·122	·138	·164	·171	Sa
Ssa	·138	·178	·184	·129	Ssa

Values of κ's at Pámban.

Tide	κ 1878-79	κ 1879-80	κ 1880-81	κ 1881-82	Tide
	°	°	°	°	
S_1	146·13	130·89	153·29	163·15	S_1
S_2	90·11	92·31	91·35	94·19	S_2
S_4	286·82	191·31	261·87	304·16	S_4
S_6	245·56	167·91	195·46	179·05	S_6
S_8	248·50	254·75	257·20	135·00	S_8
M_1	16·74	38·20	64·33	18·94	M_1
M_2	46·55	46·75	45·99	48·51	M_2
M_3	170·37	168·41	164·79	177·45	M_3
M_4	198·68	190·48	199·10	187·35	M_4
M_6	41·90	50·29	40·24	34·25	M_6
M_8	294·01	347·63	303·29	312·85	M_8
O	46·52	44·83	42·81	46·77	O
K_1	43·66	45·02	45·17	48·73	K_1
K_2	83·59	92·07	88·59	94·19	K_2
P	43·73	46·84	45·78	49·57	P
J	68·24	44·49	37·95	42·10	J
Q	84·20	98·42	91·24	81·48	Q
L	56·01	48·86	78·71	50·20	L
N	29·10	30·26	32·20	31·83	N
λ	63·03	24·06	353·92	173·02	λ
ν	81·70	49·26	14·96	334·12	ν
μ	77·62	98·04	94·88	148·26	μ
R	...	132·75	...	94·37	R
T	...	104·14	...	79·27	T
MS	291·60	293·92	285·94	294·52	MS
2SM	5·58	338·44	339·81	288·49	2SM
2N	356·91	13·86	75·61	331·14	2N
M_2N	157·69	229·65	170·99	265·83	M_2N
M_2K_1	155·64	243·16	309·65	48·17	M_2K_1
$2M_2K_1$	346·54	319·17	297·41	277·23	$2M_2K_1$
Mm	348·98	57·52	22·84	39·72	Mm
Mf	1·56	355·31	359·13	343·58	Mf
MSf	173·59	208·90	156·88	26·51	MSf
Sa	298·92	318·05	286·80	304·03	Sa
Ssa	95·54	109·88	116·70	111·04	Ssa

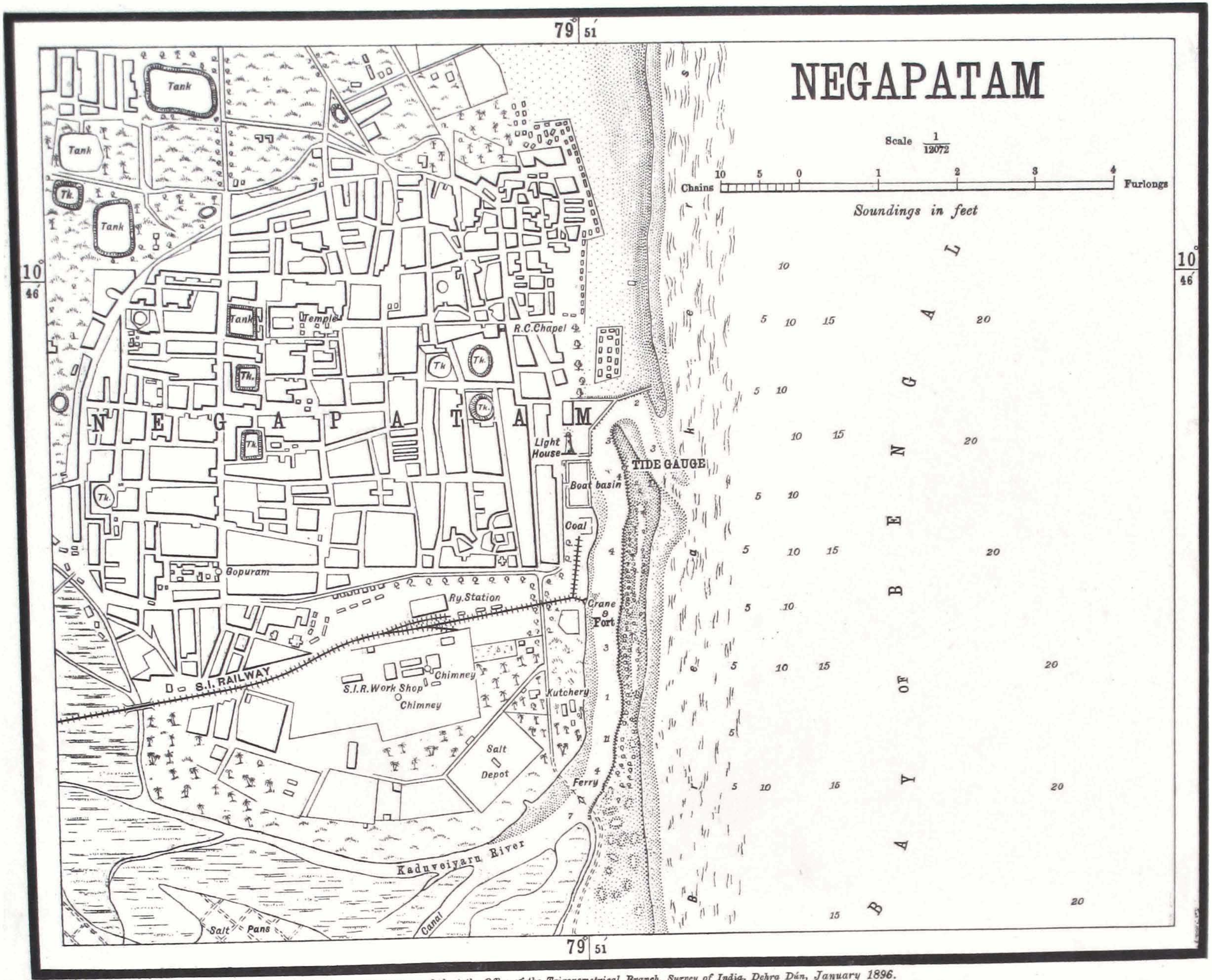
NEGAPATAM.

(*Tidal Observatory, Lat. 10° 46′ N., Long. 79° 51′ E.*)

The tidal observatory at Negapatam at the southern extremity of the Coromandel Coast of India was one of the minor observatories at which five years' observations are generally considered sufficient, and was situated on the south side of the backwater locally called Kadaveár, and about a hundred yards east of the Quay wall, in the position shown on the accompanying chart. It was a wooden cabin built on piles driven about eight feet into the ground, and having its floor about three feet above highest tides. Instead of an iron float-cylinder a strong teak casing about two feet square in section and twelve feet long, protected by sheet copper, was used. The top of the casing was about three and a half feet above the highest tides and the bottom an equal distance below the lowest tides. The communication was through holes pierced in the casing about two feet below the lowest tides.

The working scale of the tide-gauge was the natural scale.

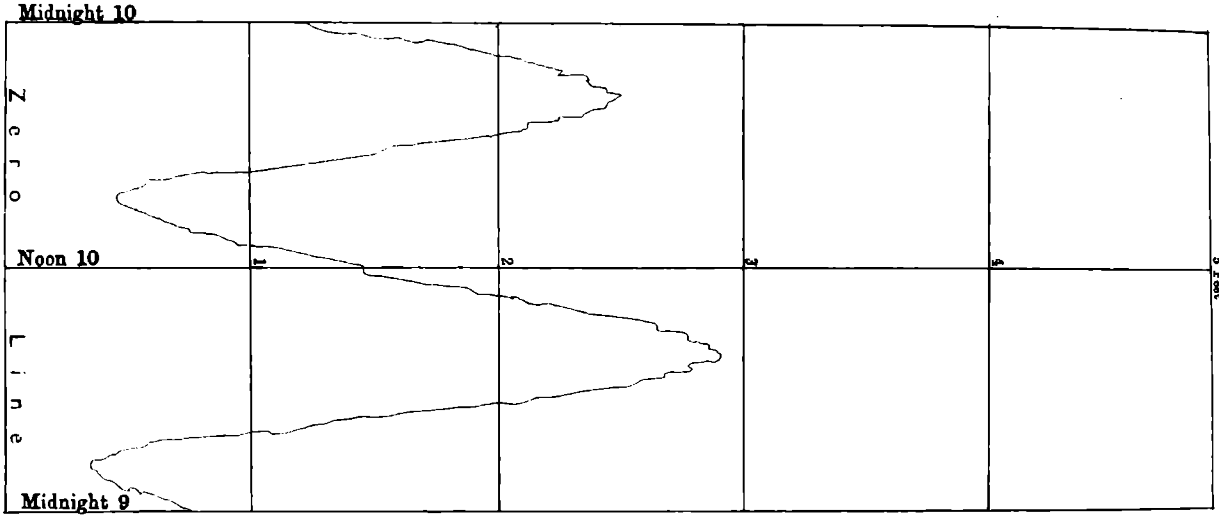
Registrations were commenced on the 1st November, 1881, but were not properly recorded until the 6th of the following month. They were then satisfactory till November, 1883; but about that time the observations were quite vitiated owing to the extreme retardation caused by a serious accumulation of sand round the float-casing. Attempts were made to clear away the sand, and improve the communication by boring more holes in the casing and using a copper communication pipe about eleven feet long; but the observations continued to be untrustworthy until March, 1885, when the natural conditions that had caused the accumulation seem to have changed, and the casing was again left free and was with much care kept so until the 30th April, 1888, when the observations were completed and the observatory closed. The years in which the observations were satisfactory and have been accepted are 1881-82, 1882-83, 1885-86, 1886-87, 1887-88.



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, January 1896.

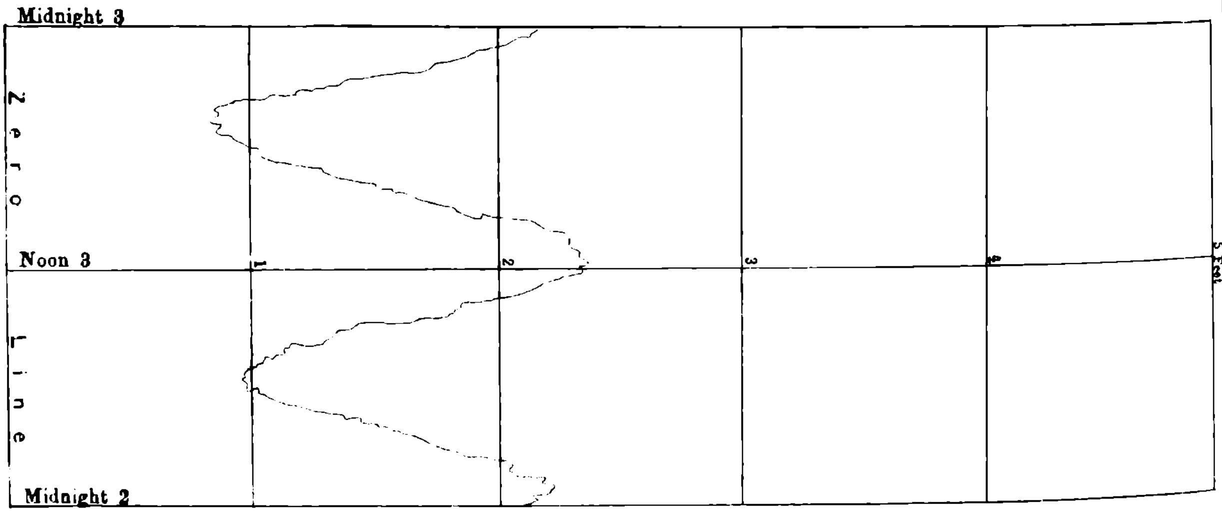
TIDAL CURVES
at
NEGAPATAM

Spring Tide —— 10th August 1885



New Moon —— 10th August 1885

Neap Tide —— 3rd August 1885



Last Quarter —— 3rd August 1885

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, September 1900.

The disturbances of the surface of the ocean, caused by an earthquake whose centre lay between Port Blair and Car Nicobar, were recorded at this station by the self-registering tide-gauge on the 31st December, 1881, and those caused by the Krakatoa volcanic eruptions were similarly recorded on the 27th August, 1883.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference is a flag stone embedded in the verandah of the Port Office and opposite the Custom Office window, and engraved $\overset{\text{G. T. S.}}{\underset{\text{B.M.}}{\circ}}$ A. It is 11·605 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $IX^h\ 0^m$.

The highest high water recorded was 5·1 feet above the zero of the gauge, and occurred in November, 1886.

The lowest low water recorded was identical with the zero of the gauge, and occurred in August, 1885.

In 1881-82 the mean range of largest ordinary springs was found to be 2·6 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1881-82	...	...	...	1·996 feet.
1882-83	...	...	...	2·048 „
1885-86	...	...	...	1·811 „
1886-87	...	...	...	2·048 „
1887-88	...	...	...	2·047 „

Values of H's *at Negapatam.*

Tide	H 1881-82	1882-83	1885-86	1886-87	1887-88	Tide
	Feet	Feet	Feet	Feet	Feet	
S_1	0·048	0·044	0·040	0·021	0·055	S_1
S_2	·271	·277	·284	·261	·249	S_2
S_4	·006	·004	·006	·006	·004	S_4
S_6	·000	·000	·001	·001	·002	S_6
S_8	·001	·001	·001	·001	·000	S_8
M_1	·003	·006	·017	·016	·008	M_1
M_2	·712	·727	·739	·706	·654	M_2
M_3	·003	·003	·004	·002	·004	M_3
M_4	·023	·018	·017	·021	·031	M_4
M_6	·010	·013	·011	·010	·009	M_6
M_8	·005	·004	·004	·003	·001	M_8
O	·092	·089	·087	·087	·088	O
K_1	·222	·227	·224	·216	·210	K_1
K_2	·071	·082	·078	·097	·091	K_2
P	·083	·085	·080	·075	·074	P
J	·006	·016	·019	·014	·008	J
Q	·007	·007	·007	·001	·003	Q
L	·022	·031	·039	·047	·030	L
N	·164	·152	·168	·151	·157	N
λ	·025	·005	·016	·031	...	λ
ν	·048	·047	·039	·015	·020	ν
μ	·018	·024	·016	·015	·014	μ
R	...	·031	...	·031	...	R
T	...	·050	...	·037	...	T
MS	·019	·017	·018	·018	·024	MS
2SM	·007	·006	·006	·003	·006	2SM
2N	·027	·026	·035	·015	·020	2N
M_2N	·015	·032	·024	·048	·022	M_2N
M_2K_1	·012	·012	·010	·015	·020	M_2K_1
$2M_2K_1$	·007	·007	·006	·009	·007	$2M_2K_1$
Mm	·081	·032	·076	·008	·048	Mm
Mf	·061	·017	·080	·098	·073	Mf
MSf	·084	·097	·025	.026	·043	MSf
Sa	·543	·522	·348	·444	·364	Sa
Ssa	·400	·316	·300	·328	·377	Ssa

Values of κ's at Negapatam.

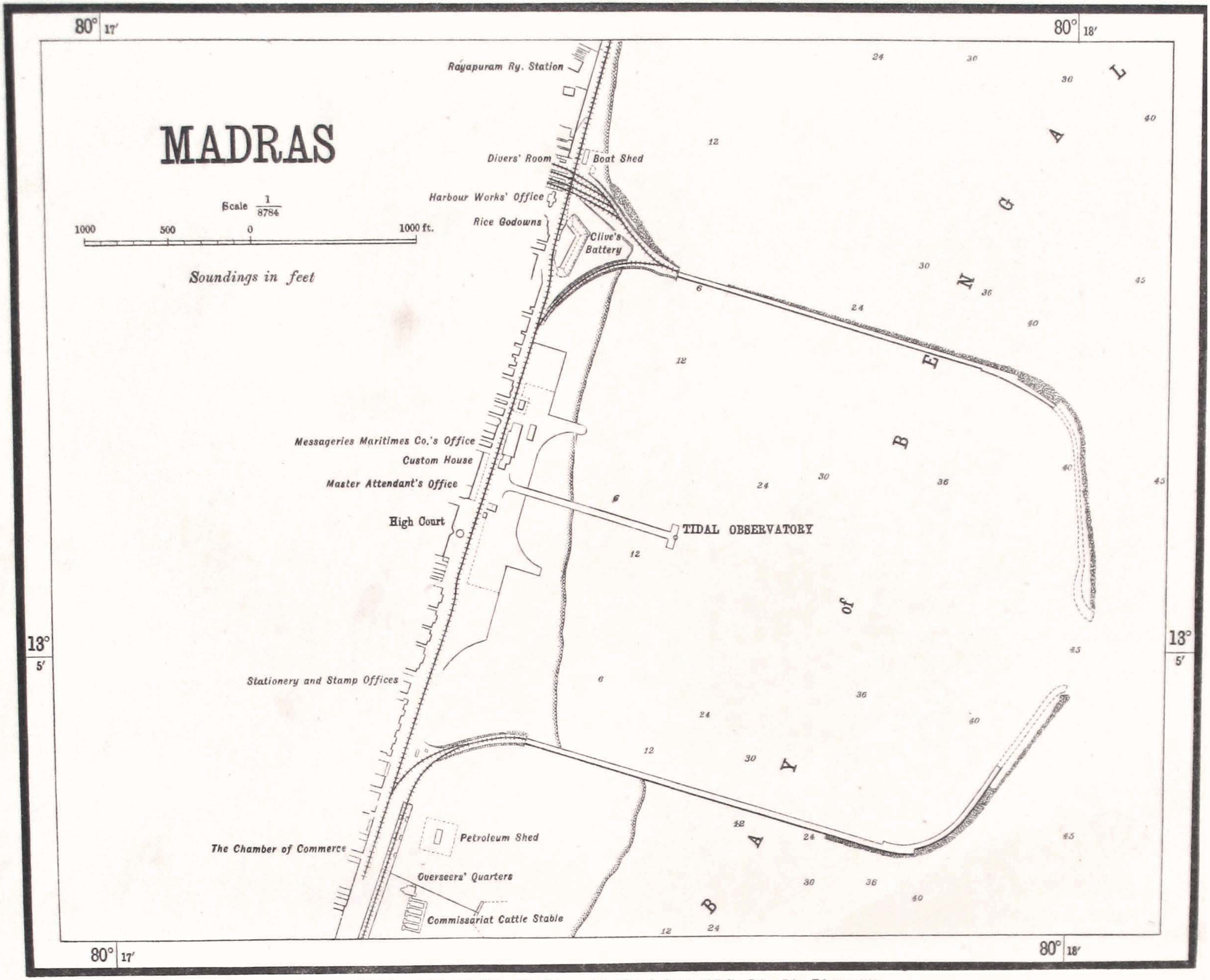
Tide	κ					Tide
	1881-82	1882-83	1885-86	1886-87	1887-88	
	°	°	°	°	°	
S_1	116·78	99·59	95·91	97·36	120·32	S_1
S_2	282·72	285·69	280·91	281·07	285·44	S_2
S_4	136·36	166·33	106·61	125·88	139·69	S_4
S_6	135·00	165·96	146·31	251·57	97·60	S_6
S_8	225·00	228·37	240·95	218·66	153·44	S_8
M_1	148·92	72·88	303·16	289·39	3·75	M_1
M_2	251·22	252·05	249·31	250·99	252·74	M_2
M_3	73·46	133·35	85·49	72·57	78·35	M_3
M_4	76·06	77·16	71·18	75·58	96·36	M_4
M_6	130·33	126·07	124·49	135·14	133·53	M_6
M_8	297·26	308·82	252·11	334·54	149·21	M_8
O	319·82	323·24	318·05	325·84	321·25	O
K_1	345·11	345·32	346·55	348·58	349·04	K_1
K_2	280·50	290·52	285·04	286·09	281·93	K_2
P	342·47	350·18	339·72	347·52	344·40	P
J	348·09	307·30	356·72	34·82	355·74	J
Q	143·17	218·60	284·01	310·17	34·46	Q
L	278·33	278·85	264·92	219·13	272·14	L
N	242·78	245·55	237·00	231·62	239·46	N
λ	233·77	228·84	306·94	324·38	...	λ
ν	228·46	206·21	209·02	273·36	279·22	ν
μ	131·73	112·94	127·70	103·32	104·27	μ
R	...	348·88	...	300·28	...	R
T	...	254·78	...	243·38	...	T
MS	95·94	96·39	85·61	107·12	111·26	MS
2SM	160·57	216·11	198·15	230·46	207·74	2SM
2N	213·32	219·95	219·33	183·27	213·73	2N
M_2N	72·18	83·72	120·70	181·63	155·28	M_2N
M_2K_1	154·04	184·11	69·02	143·81	195·41	M_2K_1
$2M_2K_1$	331·17	346·54	334·53	335·54	336·23	$2M_2K_1$
Mm	345·28	310·44	318·25	346·87	352·42	Mm
Mf	34·83	338·46	354·06	5·40	351·26	Mf
MSf	1·78	13·12	81·65	51·16	15·11	MSf
Sa	230·61	232·64	248·80	229·60	227·97	Sa
Ssa	125·53	134·13	128·63	129·04	120·86	Ssa

MADRAS.

(*Tidal Observatory, Lat. 13° 5′ N., Long. 80° 18′ E.*)

The tidal station of Madras was originally (and will be again) classed as one of the permanent stations; but tidal observations there are at present in abeyance, owing to the Madras Government having closed the tidal observatory after ten years' registrations had been obtained. Observations in the Madras Harbour were attempted first in 1879 with a float-cylinder about twelve feet long sunk in the sand to a depth of about five feet below low water, at a spot on the beach, beneath the flooring of the iron pier, one hundred feet above high water mark. The communication was through a three-inch pipe which left the cylinder at the bottom and which was in the form of a siphon. The short branch rose vertically outside the cylinder to about the level of mid-tide, and the pipe then sloped gently downwards for about six hundred feet into deep water. The observatory was a wooden cabin, twelve feet long by nine feet wide, firmly fixed to the beams and piles of the pier so that it could not settle. During the cyclone of the 20th and 21st May, 1879, the communication pipe was destroyed by the surf. It was found choked and dislocated, and the greater part of it so deeply buried in the sand that it could not be recovered. Another plan was then devised for connecting the cylinder with the sea. A siphon, made of one-inch gas piping, was carried from the bottom of the cylinder up to about three feet below the flooring of the pier so as to be safe from the action of the surf and was thence carried out under the flooring for about six hundred feet to a point whence it descended vertically into deep water. This arrangement also failed owing to the difficulty of expelling the air from so great a length of pipe. Observations at this site had consequently to be discontinued, and those which had been taken are not employed in the tidal calculations.

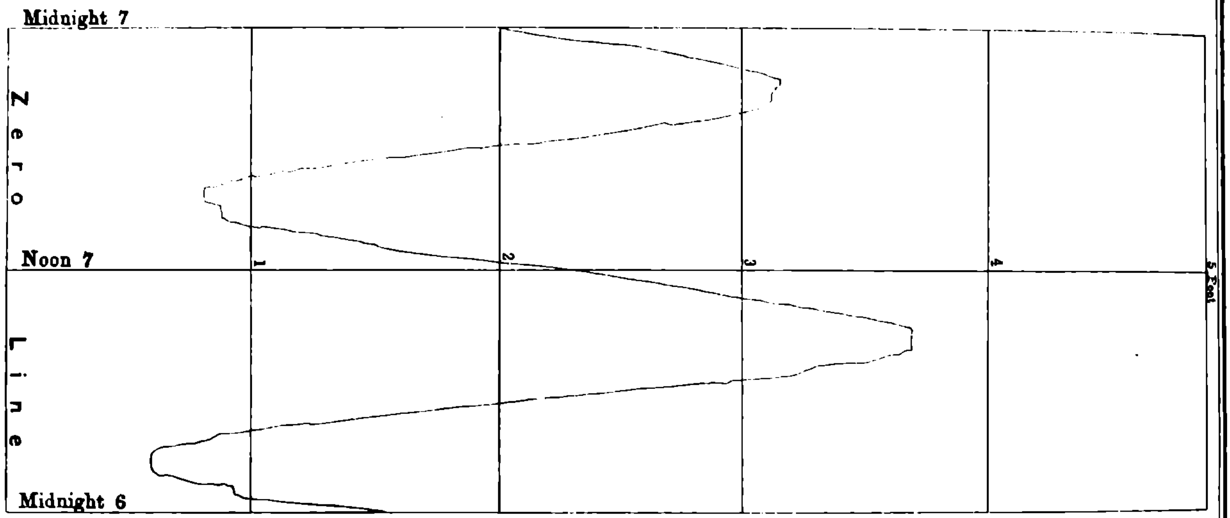
Early in 1880 a new tidal observatory was erected on the iron pier, in the position shown on the accompanying chart. The conditions of its construction, imposed by the Madras Government, were that the space occupied by it, should be the minimum possible, and that it should not interfere with the traffic. The original cabin was accordingly cut down to the smallest possible dimensions, and placed about the centre of the T-head of the pier. The new float-cylinder was twenty-seven feet long and only seven inches in diameter so as to present as small a surface as possible to the action of the surf. Its upper end was secured to, and rose a few inches above, the floor of the observatory, and its



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, February 1897.

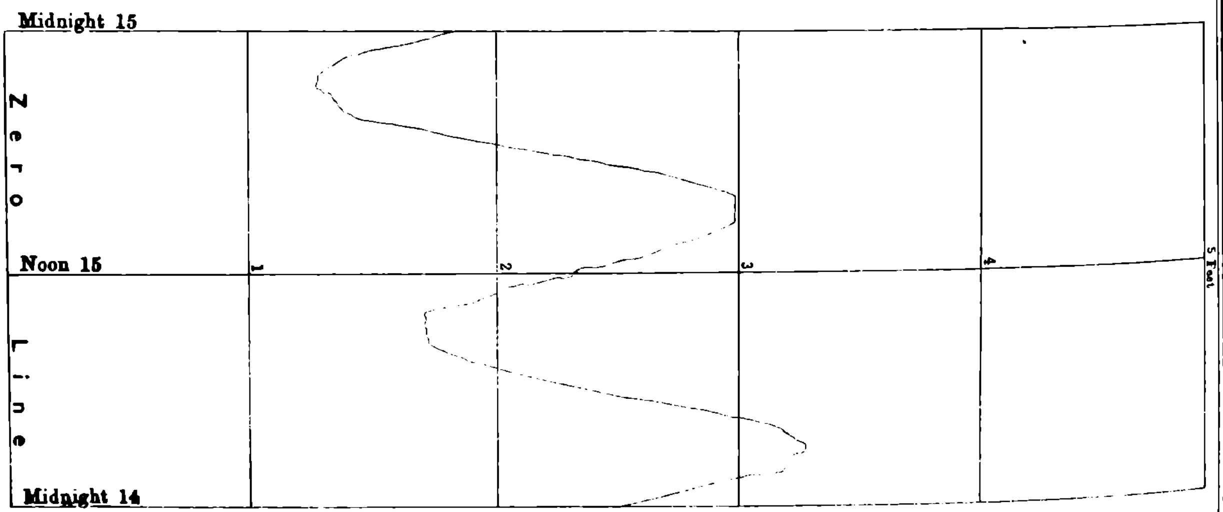
TIDAL CURVES
at
MADRAS

Spring Tide —— 7th August 1884



Full Moon —— 6th August 1884

Neap Tide —— 15th August 1884



Last Quarter —— 14th August 1884

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, April 1900.

Regr. No. D. 331, S. I. D. - May 1900 - 500

lower end was about ten feet above the harbour-bed and about six feet below lowest tides. It was held in position vertically by three upright iron bars driven to a depth of about nine feet into the harbour-bed, and the whole was attached by a system of chain lashings to the contiguous piles of the pier. The communication was through a double rose protecting the bottom of the cylinder from sand and sea-weed, above which, and plugging the cylinder, was a wooden block through which a central hole one inch in diameter had been drilled, and which was capped by a copper cone in the apex of which there was a small perforation an eighth of an inch in diameter to hinder the momentary undulations of the external water being transmitted to the float. A specially constructed float was employed, six inches in diameter and three feet long, weighted at the bottom so as to remain vertical. The float-band after passing up from the float over the stud-wheel went down into a vertical pipe made for the reception of a specially devised counterpoise. The pipe, which was of three-inch bore, nine feet long, and closed at bottom, was fixed a couple of feet below the stud-wheel and passed down through the floor of the observatory.

The working scale of the tide-gauge was the natural scale.

Registrations were commenced on the 1st February, 1880. The gauge with which they were taken was modified to suit the peculiarities of the float and float-cylinder, the modification precluding the possibility of changing the working scale, so that special arrangements had to be made in order to register the extreme tides, which went beyond the limits of the recording drum. The gauge worked continuously during the first year and the registrations during the second were only interrupted for one period of seventeen days while the cylinder was being cleaned. There were many interruptions afterwards, and all along there was probably considerable retardation, though (owing to the surf, which rendered readings to a graduated staff impossible) it could not be measured. On the whole, owing to faults of design, to the choking of the double rose and minute communication hole, to friction of the stud-wheel and between the cylinder and float, which became covered with marine incrustations, to the small size of the float, to the counterpoise arrangement, and above all to the constant stopping of the driving clock from shocks caused by the traffic on the pier, the observations cannot be considered satisfactory. They were discontinued on the 10th October, 1890; but the Madras Government have recently consented to their resumption on the lines followed at other important tidal stations, at first temporarily, at the iron pier, and eventually, as a permanent measure, in a properly designed tidal observatory on one of the arms of the Harbour.

The disturbances of the surface of the ocean, caused by an earthquake whose centre lay between Port Blair and Car Nicobar, were recorded at this tidal station by the self-registering tide-gauge on the 31st December, 1881, and those caused by the Krakatoa volcanic eruptions were similarly recorded on the 27th August, 1883.

Barometrical, but not anemometrical observations were taken in the Port Office. They were not satisfactory; but all requisite meteorological statistics can be obtained from the Astronomical and Meteorological Observatories.

The bench-mark of reference consists of the inscription G. T. S. O B. M. cut on the west side of the Madras Memorial Stone laid by H. R. Highness the Prince of Wales on the 15th December, 1875, as a memorial of the commencement of the Madras Harbour Works. It is 17·97 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = IX^h 1^m.

The highest high water recorded was 5·3 feet above the zero of the gauge, and occurred in November, 1889.

The lowest low water recorded was 0·3 foot *below* the zero of the gauge, and occurred in April, 1882.

In 1880-81 the mean range of largest ordinary springs was found to be 3·5 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1880-81	2·251 feet.
1881-82	2·209 „
1882-83	2·179 „
1883-84	2·180 „
1884-85	2·134 „
1885-86	2·051 „
1886-87	2·320 „
1887-88	2·266 „
1888-89	2·133 „
1889-90	2·353 „

Values of H's *at Madras.*

Tide	H 1880-81	H 1881-82	H 1882-83	H 1883-84	H 1884-85	Tide
	Feet	Feet	Feet	Feet	Feet	
S_1	0·037	0·026	0·012	0·026	0·056	S_1
S_2	·437	·445	·440	·436	·450	S_2
S_4	·002	·002	·001	·002	·005	S_4
S_6	·002	·001	·001	·001	·001	S_6
S_8	·001	·000	·001	·000	·001	S_8
M_1	·019	·001	·004	·003	·038	M_1
M_2	1·047	1·051	1·049	1·033	1·058	M_2
M_3	0·004	0·003	0·006	0·004	0·003	M_3
M_4	·002	·001	·005	·002	·019	M_4
M_6	·010	·011	·009	·006	·008	M_6
M_8	·002	·001	·002	·002	·001	M_8
O	·094	·096	·101	·096	·100	O
K_1	·294	·291	·293	·291	·296	K_1
K_2	·121	·120	·094	·116	·086	K_2
P	·093	·094	·103	·091	·104	P
J	·029	·012	·021	·022	·030	J
Q	·004	·003	·009	·002	·007	Q
L	·037	·017	·054	·037	·026	L
N	·246	·235	·238	·229	·265	N
λ	·027	·025	·035	·009	·071	λ
ν	·053	·007	·072	·079	·145	ν
μ	·046	·048	·030	·046	·063	μ
R	...	·016	...	·016	...	R
T	...	·056	...	·019	...	T
MS	·004	·001	·004	·002	·015	MS
2SM	·020	·022	·023	·018	·021	2SM
2N	·064	·026	·023	·044	·061	2N
M_2N	·019	·050	·029	·040	·102	M_2N
M_2K_1	·011	·016	·010	·014	·025	M_2K_1
$2M_2K_1$	·008	·007	·006	·005	·006	$2M_2K_1$
Mm	·040	·047	·055	·027	·017	Mm
Mf	·030	·050	·055	·044	·020	Mf
MSf	·001	·034	·021	·023	·026	MSf
Sa	·372	·335	·449	·520	·366	Sa
Ssa	·275	·383	·257	·300	·362	Ssa

Values of H's *at Madras*—(Continued).

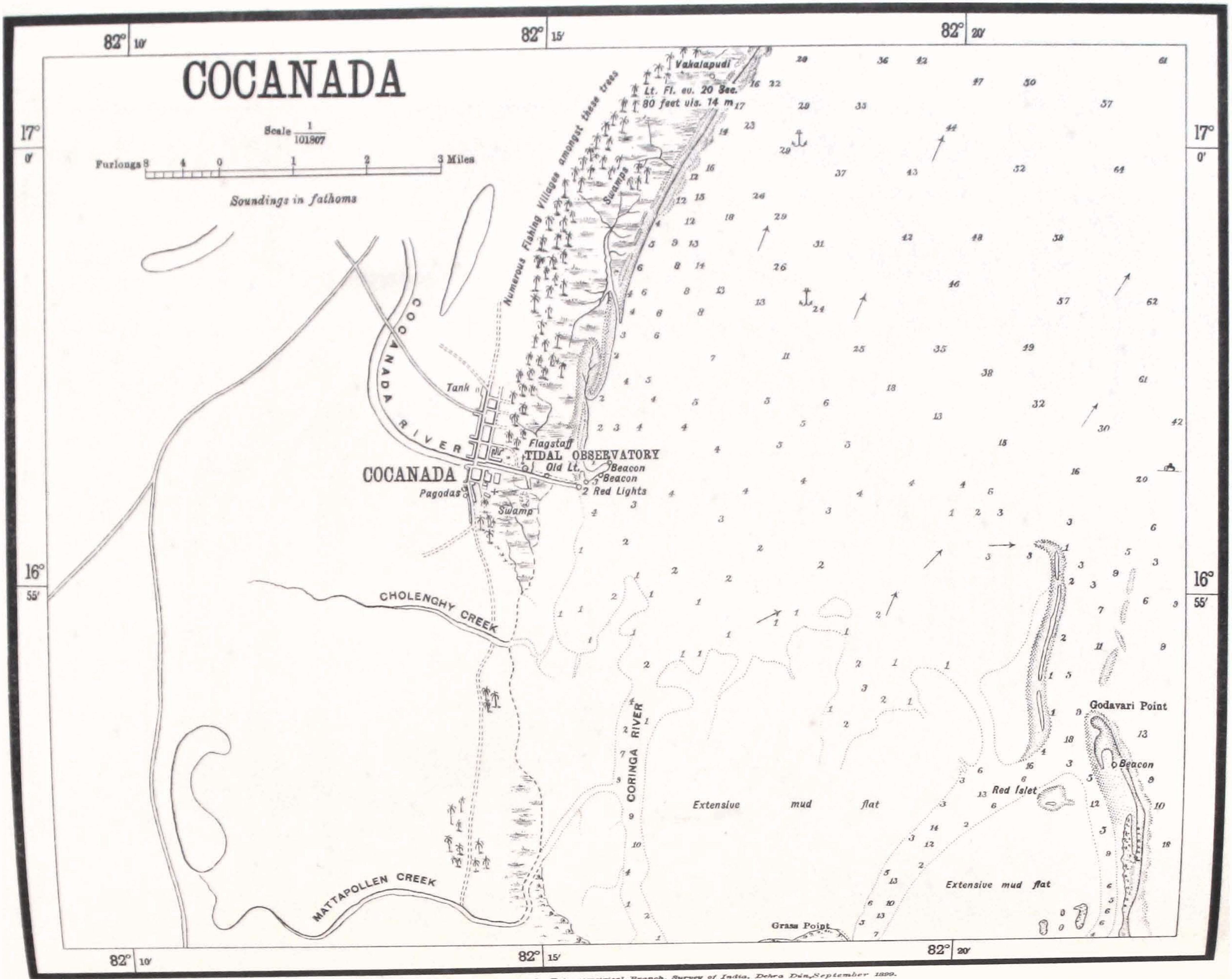
Tide	H					Tide
	1885-86	1886-87	1887-88	1888-89	1889-90	
	Feet	Feet	Feet	Feet	Feet	
S_1	0·017	0·078	0·005	0·023	0·035	S_1
S_2	·415	·442	·393	·461	·435	S_2
S_4	·003	·002	·003	·002	·003	S_4
S_6	·001	·002	·001	·001	·001	S_6
S_8	·001	·001	·000	·001	·002	S_8
M_1	·018	·014	·013	·019	·008	M_1
M_2	·983	1·019	·950	1·063	1·069	M_2
M_3	·003	0·004	·004	0·006	0·005	M_3
M_4	·014	·008	·003	·010	·008	M_4
M_6	·006	·011	·004	·008	·009	M_6
M_8	·003	·003	·003	·001	·001	M_8
O	·089	·107	·089	·098	·104	O
K_1	·286	·281	·280	·301	·305	K_1
K_2	·118	·163	·108	·132	·102	K_2
P	·090	·070	·084	·098	·106	P
J	·006	·014	·029	·029	·020	J
Q	·009	·019	·013	·010	·005	Q
L	·040	·094	·020	·044	·030	L
N	·193	·183	·237	·268	·268	N
λ	·012	...	...	...	...	λ
ν	·050	·118	·053	·073	·086	ν
μ	·063	·037	·049	·050	·047	μ
R	·053	...	...	...	...	R
T	·080	·067	·036	·017	·027	T
MS	·010	·010	·001	·006	·008	MS
2SM	·009	·012	·022	·021	·015	2SM
2N	·032	·041	·038	·062	·051	2N
M_2N	·021	·041	·029	·022	·022	M_2N
M_2K_1	·010	,004	·014	·014	·013	M_2K_1
$2M_2K_1$	·007	·003	·004	·006	·006	$2M_2K_1$
Mm	·056	·005	·023	·060	·044	Mm
Mf	·054	·055	·044	·056	·033	Mf
MSf	·035	·006	·004	·044	·030	MSf
Sa	·351	·491	·286	·397	·408	Sa
Ssa	·289	·363	·307	·391	·219	Ssa

Values of κ's at Madras.

Tide	κ 1880-81	κ 1881-82	κ 1882-83	κ 1883-84	κ 1884-85	Tide
	°	°	°	°	°	
S_1	80·49	96·10	98·75	87·56	99·61	S_1
S_2	277·36	274·77	276·38	279·54	279·79	S_2
S_4	97·77	168·69	217·88	216·87	302·28	S_4
S_6	60·64	98·75	175·91	56·31	63·44	S_6
S_8	131·19	63·44	290·56	198·44	333·44	S_8
M_1	3·63	312·47	64·66	41·22	282·99	M_1
M_2	249·43	246·71	248·05	250·41	248·36	M_2
M_3	65·44	55·15	66·81	57·11	8·41	M_3
M_4	129·65	114·89	192·58	154·43	225·93	M_4
M_6	160·80	148·61	153·53	160·40	165·04	M_6
M_8	331·11	84·49	83·08	29·13	18·81	M_8
O	326·83	323·65	324·77	330·69	321·88	O
K_1	339·58	338·26	342·06	342·39	340·85	K_1
K_2	277·59	276·44	285·72	268·22	269·19	K_2
P	340·64	341·06	350·05	344·11	346·29	P
J	336·70	314·06	303·71	317·89	346·06	J
Q	140·43	150·02	43·21	68·08	280·23	Q
L	277·81	334·52	309·82	287·20	359·29	L
N	242·97	240·19	242·38	244·21	238·02	N
λ	347·86	282·51	267·77	215·60	73·29	λ
ν	208·58	287·30	317·66	255·43	224·36	ν
μ	183·67	167·31	183·46	190·28	194·85	μ
R	...	103·18	...	357·92	...	R
T	...	256·61	...	19·34	...	T
MS	176·87	54·27	280·06	36·52	256·91	MS
2SM	228·14	219·84	177·87	232·71	256·55	2SM
2N	231·35	248·36	254·08	229·24	201·21	2N
M_2N	81·73	81·83	199·81	140·39	76·94	M_2N
M_2K_1	33·46	98·25	185·05	290·88	10·18	M_2K_1
$2M_2K_1$	79·00	68·35	65·64	51·89	14·48	$2M_2K_1$
Mm	40·65	130·38	68·07	284·73	0·23	Mm
Mf	4·84	349·21	24·86	64·88	25·41	Mf
MSf	84·35	45·82	44·09	29·70	128·19	MSf
Sa	200·56	224·82	211·31	234·73	215·09	Sa
Ssa	119·83	148·67	114·65	139·09	137·41	Ssa

Values of κ's at Madras—(Continued).

Tide	κ 1885-86	1886-87	1887-88	1888-89	1889-90	Tide
	°	°	°	°	°	
S_1	75·22	147·89	353·16	95·04	65·52	S_1
S_2	289·92	286·34	291·44	278·36	271·25	S_2
S_4	287·75	272·86	263·42	236·98	276·12	S_4
S_6	66·04	141·34	201·80	135·00	53·97	S_6
S_8	50·19	39·29	243·44	304·99	304·70	S_8
M_1	268·91	302·80	353·99	326·07	344·93	M_1
M_2	258·54	251·69	262·45	250·13	242·64	M_2
M_3	359·58	33·67	30·37	28·67	71·10	M_3
M_4	225·20	247·99	237·13	212·78	196·35	M_4
M_6	203·94	157·75	176·45	164·00	114·30	M_6
M_8	192·00	295·30	166·00	3·08	175·55	M_8
O	332·80	324·97	339·74	326·70	322·22	O
K_1	345·82	343·29	350·62	341·26	338·78	K_1
K_2	305·28	276·11	278·34	280·84	255·01	K_2
P	348·17	343·84	356·63	345·29	334·48	P
J	323·27	249·39	336·07	339·03	322·93	J
Q	96·33	87·07	78·95	117·00	175·81	Q
L	298·72	275·37	313·20	313·63	224·20	L
N	250·21	242·09	247·77	239·22	231·50	N
λ	222·48	...	...	...	...	λ
ν	177·44	341·31	267·30	267·68	249·21	ν
μ	170·03	154·02	201·64	187·99	160·02	μ
R	145·65	...	...	...	...	R
T	224·68	264·22	316·28	56·27	284·69	T
MS	269·98	296·62	339·34	239·73	221·74	MS
2SM	236·08	110·57	247·90	246·71	197·35	2SM
2N	287·81	245·55	221·60	200·32	214·04	2N
M_2N	100·87	95·25	175·20	252·32	216·64	M_2N
M_2K_1	85·49	202·92	312·63	61·69	301·97	M_2K_1
$2M_2K_1$	102·88	34·10	62·27	40·60	69·66	$2M_2K_1$
Mm	335·70	104·90	308·39	341·27	20·02	Mm
Mf	343·37	75·83	318·19	28·52	2·78	Mf
MSf	334·12	135·60	121·71	332·69	121·82	MSf
Sa	227·84	201·37	222·83	223·85	203·37	Sa
Ssa	140·09	128·63	105·48	113·46	114·92	Ssa



Regr. No. D. 179. S. I. D. - June 99-500

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, September 1899.

COCANADA.

(Tidal Observatory, Lat. 16° 56′ N., Long. 82° 15′ E.)

The tidal observatory at Cocanada, on the east coast of India, near the mouth of the Godávari, was one of the minor observatories at which five years' observations are considered sufficient, and was situated on the northern bank of the Godávari Canal, twenty feet from the bank and near the Port Officer's landing jetty, in the position shown on the accompanying chart. It was a wooden cabin resting on piles about sixteen feet long driven five feet into the mud. The observatory and the instruments contained in it, including the iron float-cylinder, had been used before at Vizagapatam. The float-cylinder was twenty-two inches in internal diameter and twelve feet long, with a wooden addition three feet long above it. It was supported by iron collars and rods attached to the piles on which the observatory rested. The bottom of the cylinder was about four feet below the lowest tides and the wooden top about two feet above the highest. The communication was by a short bent pipe which left the cylinder about nine inches above the bottom, and after turning upwards for about a foot ended in a rose two feet below the lowest tides.

The working scale of the tide-gauge was one-half.

Registrations were commenced on the 31st March, 1886. For the first three years they were absolutely without interruption, and the few subsequent stoppages were quite insignificant. Five years' perfectly satisfactory observations were completed on the 18th April, 1891, and the observatory was then dismantled.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the Port Office and the anemometer on the roof of the same building.

The bench-mark of reference is a stone inscribed G. T. S. □ B. M. A, embedded in a block of masonry, near the S.E. corner of the Port Office, and three feet away from the compound wall. It is 11·298 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = VIII^h 50^m.

The highest high water recorded was 9·9 feet above the zero of the gauge, and occurred in November, 1886.

The lowest low water recorded was 1·4 feet above the zero of the gauge, and occurred in March, 1888.

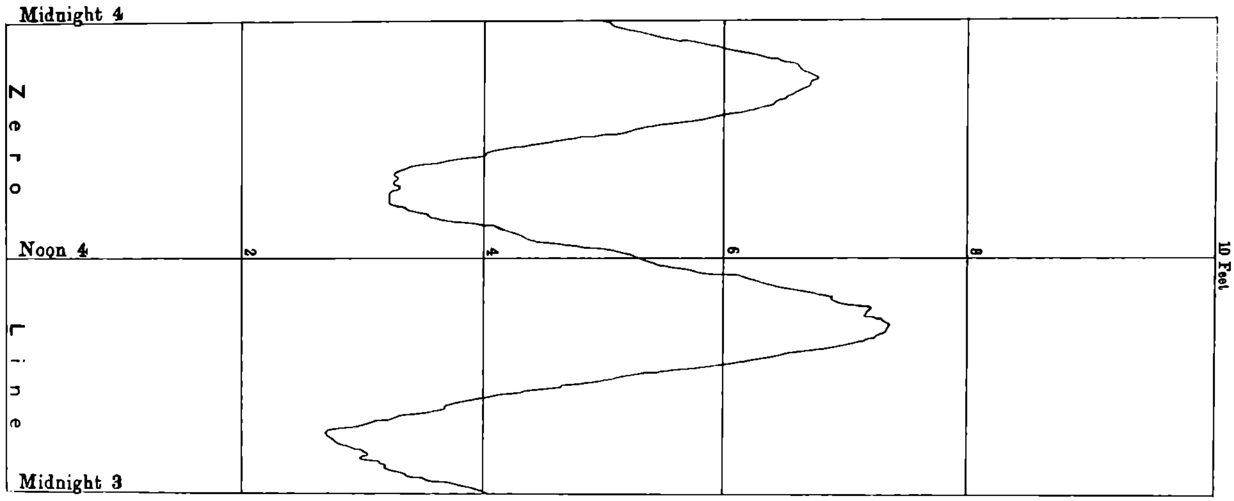
In 1890-91 the mean range of largest ordinary springs was found to be 5·0 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1886-87	...	...	...	5·488 feet.
1887-88	...	...	...	5·324 „
1888-89	...	...	...	5·154 „
1889-90	...	...	...	5·413 „
1890-91	...	...	...	5·308 „

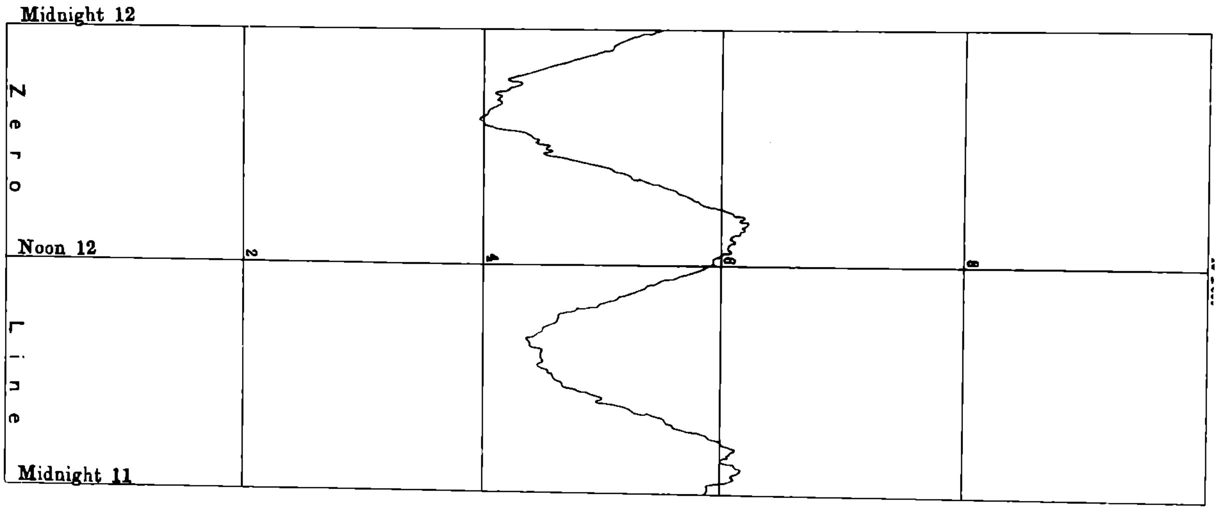
TIDAL CURVES
at
COCANADA

Spring Tide — 4th August 1887



Full Moon — 3rd August 1887

Neap Tide — 12th August 1887



Last Quarter — 11th August 1887

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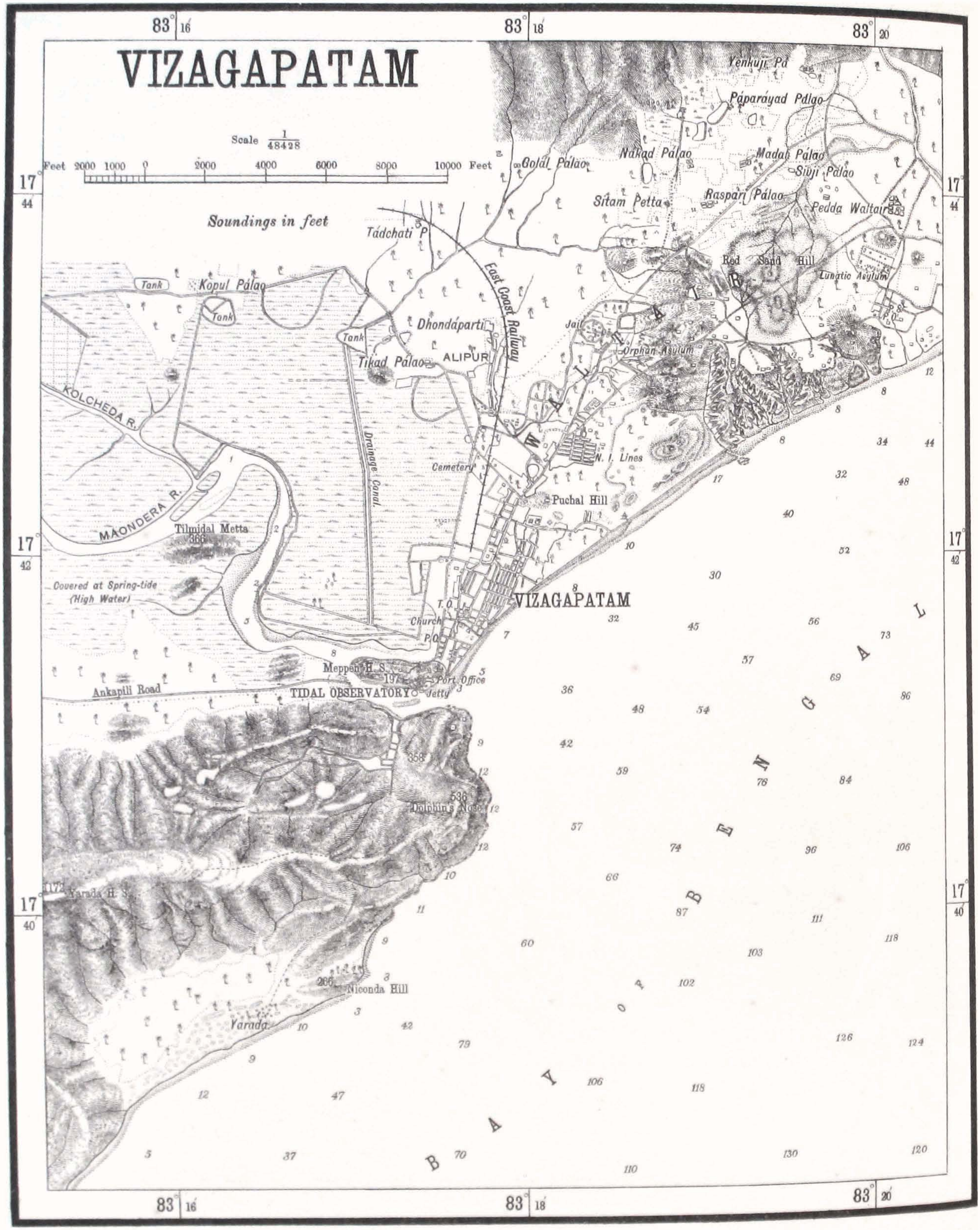
Regr. No. D. 303, S. I. D. - Sep. 99 - 600

Values of H's *at Cocanada.*

Tide	H					Tide
	1886-87	1887-88	1888-89	1889-90	1890-91	
	Feet	Feet	Feet	Feet	Feet	
S_1	0·036	0·037	0·034	0·034	0·038	S_1
S_2	·644	·628	·642	·632	·648	S_2
S_4	·003	·007	·008	·006	·007	S_4
S_6	·003	·004	·003	·001	·002	S_6
S_8	·003	·003	·003	·002	·002	S_8
M_1	·019	·023	·018	·022	·010	M_1
M_2	1·486	1·545	1·525	1·493	1·517	M_2
M_3	0·006	0·009	0·006	0·007	0·009	M_3
M_4	·026	·027	·032	·030	·034	M_4
M_6	·014	·016	·017	·016	·018	M_6
M_8	·002	·002	·001	·003	·003	M_8
O	·133	·137	·138	·144	·135	O
K_1	·347	·352	·347	·346	·344	K_1
K_2	·175	·169	·161	·161	·180	K_2
P	·099	·089	·100	·096	·091	P
J	·028	·036	·035	·019	·023	J
Q	·017	·008	·002	·002	·001	Q
L	·075	·082	·066	·061	·046	L
N	·308	·326	·316	·325	·322	N
λ	·008	...	...	...	...	λ
ν	·071	·018	·105	·115	·092	ν
μ	·019	·032	·024	·029	·014	μ
R	...	...	...	...	...	R
T	...	·064	·087	·053	·011	T
MS	·014	·023	·027	·023	·024	MS
2SM	·015	·018	·020	·014	·014	2SM
2N	·043	·060	·041	·072	·042	2N
M_2N	·031	·041	·055	·045	·045	M_2N
M_2K_1	·024	·024	·017	·013	·014	M_2K_1
$2M_2K_1$	·011	·010	·009	·012	·007	$2M_2K_1$
Mm	·029	·076	·089	·066	·056	Mm
Mf	·078	·095	·084	·089	·073	Mf
MSf	·033	·023	·061	·059	·013	MSf
Sa	·853	·671	·583	·731	·763	Sa
Ssa	·403	·522	·403	·394	·237	Ssa

Values of κ's at Cocanada.

Tide	κ					Tide
	1886-87	1887-88	1888-89	1889-90	1890-91	
	°	°	°	°	°	
S_1	92·89	77·05	82·47	61·55	81·31	S_1
S_2	284·85	285·83	287·43	287·58	284·73	S_2
S_4	125·54	146·54	131·58	143·70	121·66	S_4
S_6	204·78	159·62	185·19	146·31	142·43	S_6
S_8	220·60	83·09	81·12	114·23	24·23	S_8
M_1	341·40	341·58	345·08	62·48	56·66	M_1
M_2	252·29	252·43	253·74	253·41	251·86	M_2
M_3	346·15	19·88	18·01	28·32	16·10	M_3
M_4	108·73	105·95	105·10	106·96	103·35	M_4
M_6	97·59	100·84	98·22	92·89	95·24	M_6
M_8	66·46	294·65	318·20	270·92	57·01	M_8
O	332·93	332·37	332·65	333·81	331·70	O
K_1	340·18	338·20	339·03	339·56	339·03	K_1
K_2	286·38	283·50	282·07	290·30	279·41	K_2
P	344·27	343·11	343·00	344·09	341·72	P
J	338·46	336·26	11·20	329·05	299·98	J
Q	35·95	20·99	113·10	93·11	325·01	Q
L	272·21	235·22	255·89	232·42	266·69	L
N	243·91	242·06	247·39	245·38	247·37	N
λ	82·90	...	...	...	...	λ
ν	190·83	302·68	289·52	252·51	208·57	ν
μ	256·73	264·01	319·18	261·12	271·94	μ
R	...	...	...	...	...	R
T	...	293·60	257·62	208·39	276·22	T
MS	130·69	144·98	143·13	141·79	120·12	MS
2SM	214·74	181·26	190·66	167·51	156·10	2SM
2N	241·70	230·09	206·38	242·37	247·28	2N
M_2N	120·41	134·83	56·68	126·38	90·07	M_2N
M_2K_1	295·91	16·47	114·42	206·59	313·30	M_2K_1
$2M_2K_1$	326·42	317·82	317·08	327·16	317·35	$2M_2K_1$
Mm	197·51	290·30	331·68	338·77	85·32	Mm
Mf	54·62	196·47	30·03	336·35	344·89	Mf
MSf	18·60	125·06	342·22	354·78	54·21	MSf
Sa	199·64	199·26	205·36	212·85	190·79	Sa
Ssa	108·63	98·77	112·06	119·13	85·78	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. October 1900.

Regr. No. D. 869, S. I. D. - July 1900 - 500

VIZAGAPATAM.

(*Tidal Observatory, Lat. 17° 41′ N., Long. 83° 17′ E.*)

The tidal observatory at Vizagapatam, about the centre of the east coast of India, was one of the minor observatories, at which five years' observations are generally considered sufficient, and was situated on the northern bank of the back-water, about fifty yards west of the landing or "bandar" house, in the position shown on the accompanying chart. It was a wooden structure, of the usual substantial kind, supported at its outer end on piles and at its inner end on a wharf wall. The flooring was intended to be well above the water at all times; but on one occasion, the 6th December, 1878, a violent storm, assisted by the flooding of the river from inland rains, raised the water into the observatory, and did serious damage, including the displacement of the float-cylinder. The cylinder was of iron, twenty-two inches in internal diameter and twelve feet long. After its displacement by the storm, its bottom was bolted to a huge flat stone and its upper end was secured by beams to the observatory floor. There were then two feet of the cylinder below the lowest tides and three feet of it above the highest, except when the water was raised by storms. The communication was at first by a two-inch piping thirty feet long, partly of iron and partly of flexible tubing, terminating in a rose ten feet below the lowest tides; but after two years' experience of it this arrangement was found to be unnecessary, and direct communication through the rose, fixed to the inlet-hole near the bottom of the cylinder, was substituted for it.

The working scale of the tide-gauge was one-half.

Registrations were commenced originally in August, 1878, and were proceeding satisfactorily when the storm above-mentioned occurred. The damage caused by it was repaired and work was restarted at the beginning of February, 1879, all preceding registrations being rejected. The record from the 3rd February, 1879, on which day the accepted registrations commenced, was satisfactory until the 7th November, 1882, when two months were devoted to repairing the piles: at the end of 1883 there were several interruptions, but as a whole the record was good until the dismantling of the observatory in March, 1885, on the completion of the observations. The disturbances of the surface of the ocean, caused by an earthquake whose centre lay between Port Blair and Car Nicobar, were recorded at this station by the self-registering tide-gauge on the 31st December, 1881, and those caused by the

Krakatoa volcanic eruptions were similarly recorded on the 27th August, 1883.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory, and the anemometer was placed on the "Dolphin's nose," a hill about a mile south of the town.

The bench-mark of reference is a stone embedded in the floor of the verandah of the Port Office and marked G. T. S. □ D. M. C. It is 18·955 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $VIII^h\ 26^m$.

The highest high water recorded was 8·9 feet above the zero of the gauge, and occurred in November, 1879.

The lowest low water recorded was 0·8 foot above the zero of the gauge, and occurred in March, 1880.

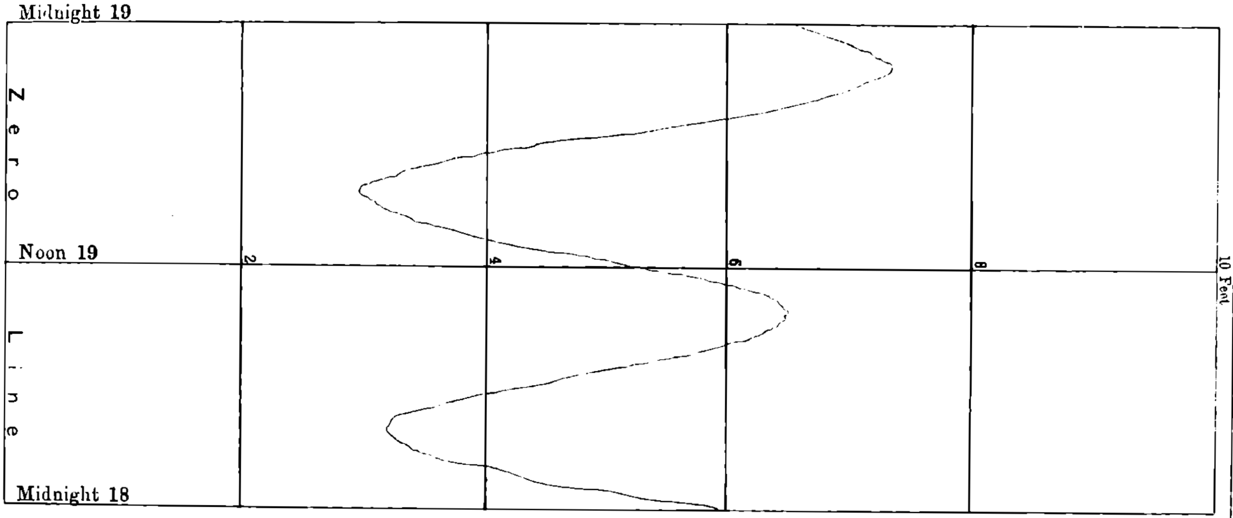
In 1879-80 the mean range of largest ordinary springs was found to be 5·1 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1879-80	...	...	...	4·991 feet.
1880-81	...	...	...	4·917 „
1881-82	...	...	...	4·809 „
1882-83	...	...	...	4·812 „
1883-84	...	...	...	4·813 „
1884-85	...	...	...	4·630 „

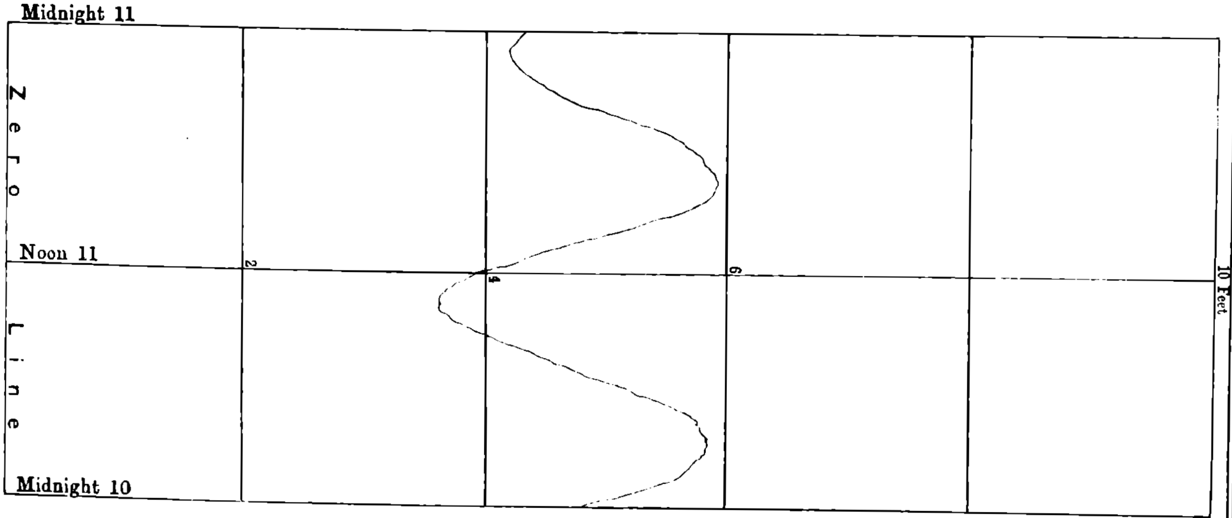
TIDAL CURVES
at
VIZAGAPATAM

Spring Tide ____ 19th December 1884



New Moon ____ 17th December 1884

Neap Tide ____ 11th December 1884



Last Quarter ____ 9th December 1884

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. September 1900.

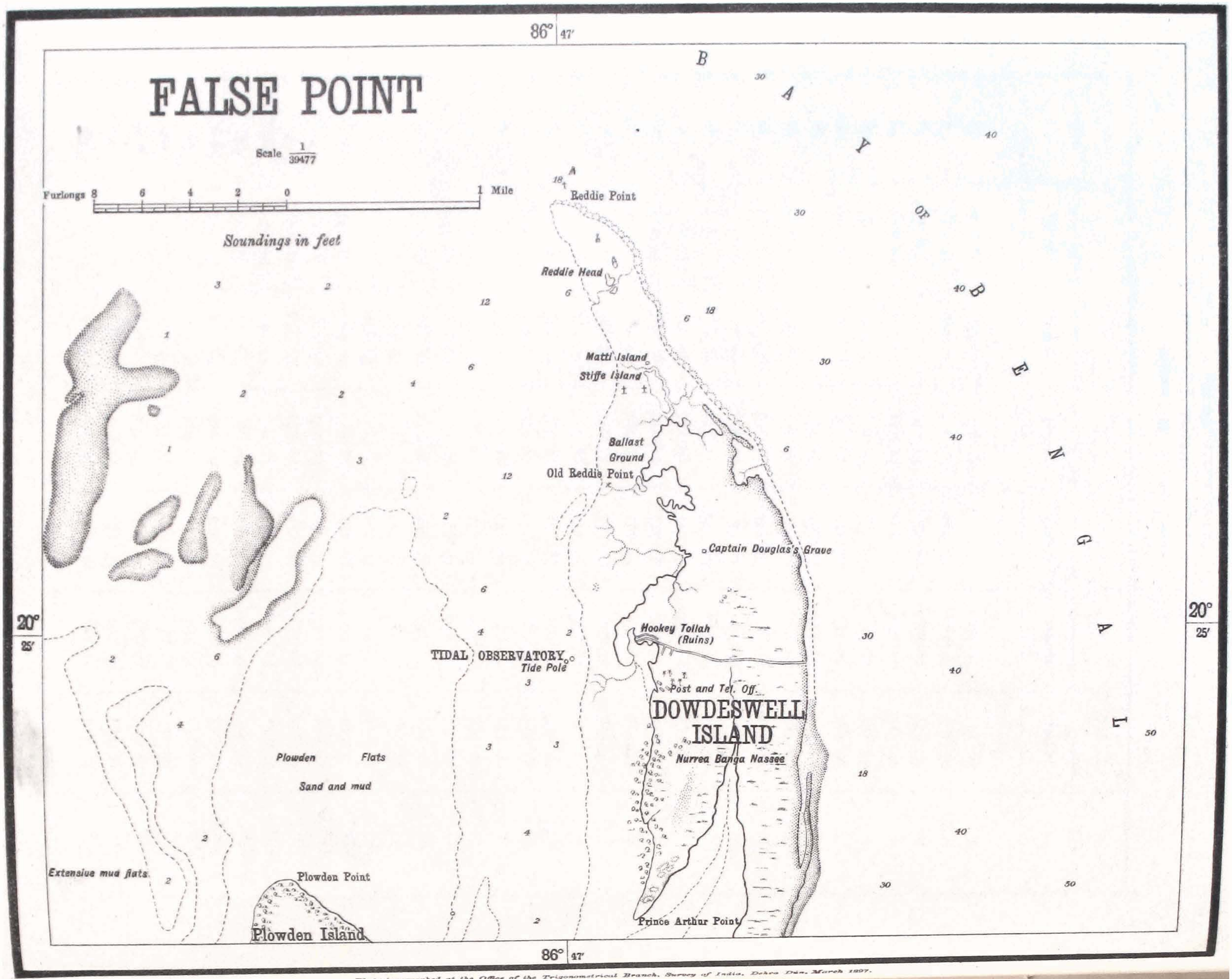
Regr. No. D. 725. S. I. D.-May 1900 500

Values of H's *at Vizagapatam.*

Tide	H						Tide
	1879-80	1880-81	1881-82	1882-83	1883-84	1884-85	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·028	0·047	0·035	0·096	0·037	0·044	S_1
S_2	·674	·659	·651	·641	·640	·625	S_2
S_4	·001	·007	·006	·006	·004	·003	S_4
S_6	·001	·001	·001	·002	·001	·001	S_6
S_8	·001	·001	·003	·001	·001	·000	S_8
M_1	·023	·021	·001	·004	·007	·016	M_1
M_2	1·532	1·460	1·459	1·439	1·464	1·462	M_2
M_3	0·007	0·001	0·006	0·008	0·007	0·009	M_3
M_4	·014	·014	·015	·018	·013	·004	M_4
M_6	·003	·004	·005	·008	·004	·007	M_6
M_8	·004	·002	·002	·005	·005	·004	M_8
O	·139	·140	·144	·142	·138	·129	O
K_1	·371	·364	·366	·335	·355	·358	K_1
K_2	·179	·157	·168	·306	·181	·163	K_2
P	·112	·104	·117	·049	·116	·109	P
J	·035	·027	·014	·024	·026	·024	J
Q	·010	·007	·004	·014	·020	·014	Q
L	·049	·044	·027	·088	·046	·078	L
N	·355	·300	·291	·309	·296	·298	N
λ	·021	·019	·022	·024	·012	·039	λ
ν	·114	·055	·002	·127	·116	·095	ν
μ	·030	·026	·016	·034	·028	·036	μ
R	...	·015	...	·039	...	·025	R
T	...	·021	...	·080	...	·036	T
MS	·007	·010	·014	·015	·012	·007	MS
2SM	·008	·010	·015	·016	·004	·012	2SM
2N	·066	·059	·044	·046	·039	·056	2N
M_2N	·019	·031	·063	·037	·042	·030	M_2N
M_2K_1	·024	·029	·006	·007	·022	·022	M_2K_1
$2M_2K_1$	·006	·010	·014	·014	·010	·015	$2M_2K_1$
Mm	·022	·078	·049	·072	·029	·010	Mm
Mf	·030	·051	·061	·027	·082	·073	Mf
MSf	·076	·021	·038	·048	·025	·019	MSf
Sa	·740	·833	·577	·707	·612	·694	Sa
Ssa	·301	·328	·458	·241	·364	·350	Ssa

Values of κ's at Vizagapatam.

Tide	κ 1879-80	1880-81	1881-82	1882-83	1883-84	1884-85	Tide
	°	°	°	°	°	°	
S_1	100·62	76·97	92·47	1·49	92·65	93·63	S_1
S_2	280·15	285·86	286·00	289·50	287·46	288·28	S_2
S_4	359·93	76·61	50·19	59·81	66·62	45·00	S_4
S_6	123·69	127·88	213·69	214·70	146·31	113·96	S_6
S_8	72·90	103·00	60·52	77·91	75·96	288·44	S_8
M_1	355·35	23·44	198·68	241·70	351·40	288·96	M_1
M_2	248·57	253·43	254·44	255·02	254·75	255·78	M_2
M_3	332·20	208·03	41·42	13·89	10·16	21·56	M_3
M_4	310·31	330·58	338·94	342·39	10·58	226·74	M_4
M_6	143·75	77·90	29·76	35·02	60·69	66·47	M_6
M_8	173·70	214·14	243·13	205·65	214·77	241·00	M_8
O	329·82	332·21	332·92	329·45	331·80	333·33	O
K_1	338·24	342·06	341·64	345·88	342·32	342·51	K_1
K_2	269·95	274·07	284·80	278·35	278·86	279·20	K_2
P	335·86	346·07	346·12	329·35	340·31	345·49	P
J	328·23	355·63	313·86	351·11	342·87	18·02	J
Q	20·37	277·12	305·98	335·85	348·49	337·74	Q
L	256·97	245·07	296·64	216·85	280·56	256·26	L
N	243·13	249·79	251·26	241·50	248·12	251·80	N
λ	200·61	331·77	244·04	278·17	213·86	299·35	λ
ν	243·58	198·62	72·20	282·51	257·14	222·81	ν
μ	234·03	258·86	217·61	326·23	257·70	264·38	μ
R	...	129·92	...	245·98	...	68·68	R
T	...	336·23	...	189·27	...	282·19	T
MS	345·10	20·01	19·81	356·76	28·23	283·37	MS
2SM	209·68	292·41	250·23	147·75	312·24	219·67	2SM
2N	234·44	219·03	258·65	224·66	244·06	218·29	2N
M_2N	84·25	32·93	344·66	28·55	30·12	58·55	M_2N
M_2K_1	329·67	19·85	66·94	294·42	334·47	25·11	M_2K_1
$2M_2K_1$	355·03	319·83	316·40	334·15	322·76	326·50	$2M_2K_1$
Mm	22·48	52·54	104·02	35·07	264·82	7·00	Mm
Mf	22·72	340·43	1·76	2·26	46·98	31·98	Mf
MSf	22·27	12·97	314·43	101·95	358·32	39·49	MSf
Sa	190·06	173·28	188·65	174·73	194·53	182·48	Sa
Ssa	88·60	126·02	140·37	100·78	127·12	128·64	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun, March 1897.

FALSE-POINT.

(*Tidal Observatory, Lat. 20° 25′ N., Long. 86° 47′ E.*)

The tidal observatory at False-Point, near the mouth of the Mahanadi river, on the east coast of India, was one of the minor observatories, and was situated to the west of the Travellers' Bungalow at Hookey Tollah, in the position shown on the accompanying chart. It was a wooden cabin, substantially built on a heavy timber staging well secured by a mass of stone rubble and also by chain guys to piles embedded in rubble. It was only accessible by boat, but the shore was only three hundred yards distant. The float-cylinder was of the exceptionally large internal diameter of four feet and was about fifteen feet long. It was embedded about ten feet in the stone rubble and secured by cross beams to the staging, so that its bottom was about five feet below the lowest tides and its top about two feet above the highest, where it passed through the floor of the observatory. The communication was by a straight horizontal two-inch pipe about twelve feet long with a rose at its outer end. It passed through the rubble about two feet below the lowest tides and entered the cylinder three feet above the bottom.

The working scale of the tide-gauge was one-third.

Registrations were commenced on the 27th September, 1880, and were fairly continuous until the 2nd October, 1882, when a twenty days' gap occurred owing to the driving clock having to be sent to Calcutta for repairs. The observatory during the first seven months after its erection settled down to the extent of seven inches, and the observations for this period were consequently rejected. In the next year it sank two inches more, and then the sinking ceased for more than a year: but between December, 1883, and March, 1885, a further settlement of one and a half inches was found to have taken place. From the 22nd October, 1882, when observations were resumed after the break above mentioned, the record, though impaired by several unimportant stoppages of the clock due to the vibration of the observatory, was fairly continuous to the end. On the 22nd September, 1885, the tidal observatory, with all the instruments, was carried away by the cyclonic sea-wave that passed over False-Point on that date, destroying all the buildings at Hookey Tollah and drowning nearly all the inhabitants. It was not considered necessary to resume operations, and a fifth year's observations were dispensed with.

The disturbances of the surface of the ocean, caused by an earthquake whose centre lay between Port Blair and Car Nicobar, were recorded at this tidal station by the self-registering tide-gauge on the 31st December, 1881, and those caused by the Krakatoa volcanic eruptions were similarly recorded on the 27th August, 1883.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference is a Marine Survey bench-mark consisting of the mark $\frac{\text{O}}{\wedge}$ cut on the south-west pile of the Refuge House at Hookey Tollah. It is 17·951 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $\text{IX}^{\text{h}}\ 18^{\text{m}}$.

The highest high water recorded was 13·1 feet above the zero of the gauge, and occurred in November, 1883.

The lowest low water recorded was 2·4 feet above the zero of the gauge, and occurred in March, 1883.

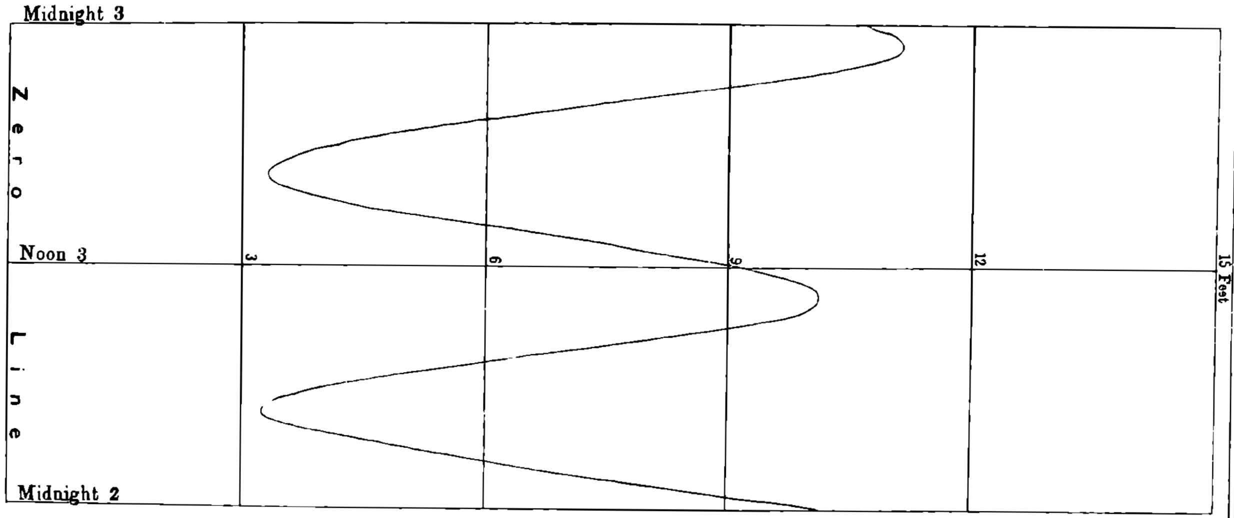
In 1881-82 the mean range of largest ordinary springs was found to be 7·3 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1881-82	...	...	...	7·552 feet.
1882-83	...	...	...	7·597 „
1883-84	...	...	...	7·593 „
1884-85	...	...	...	7·492 „

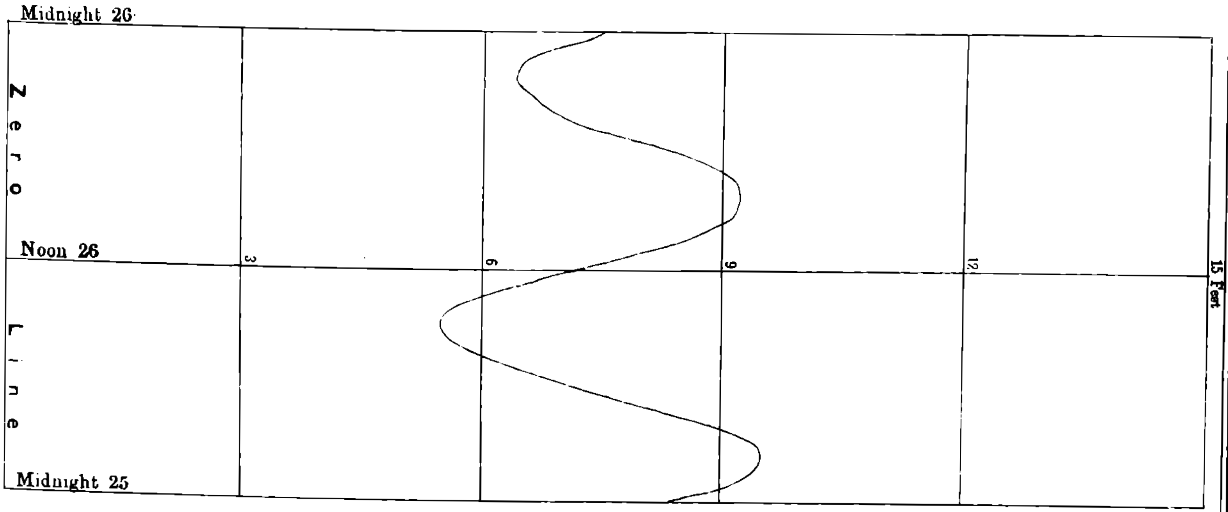
TIDAL CURVES
at
FALSE-POINT

Spring Tide —— 3rd January 1885



Full Moon —— 1st January 1885

Neap Tide —— 26th December 1884



First Quarter —— 25th December 1884

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun. July 1899.

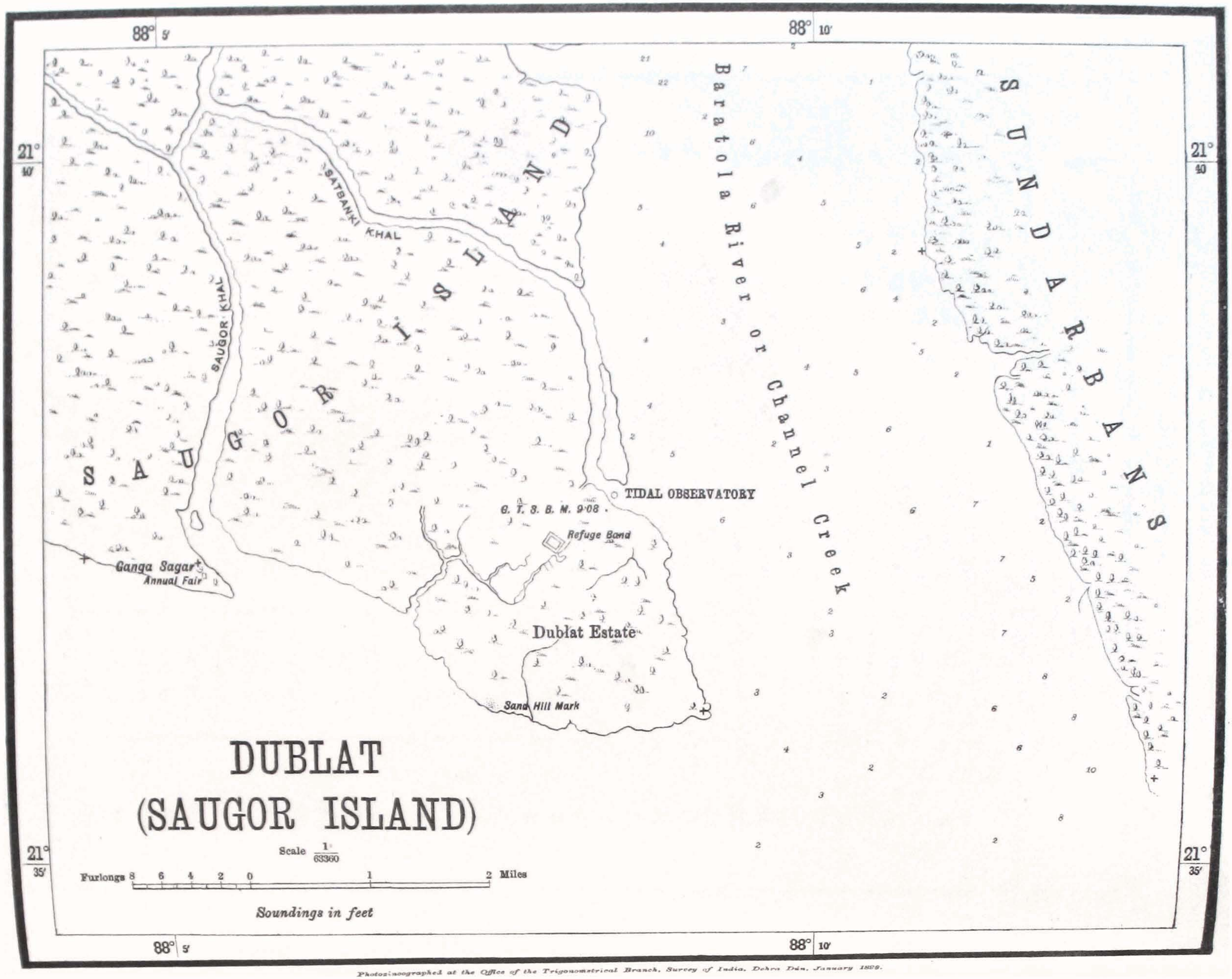
Regr. No. D.132, S. I. D. May 99.–500

Values of H's *at False-Point.*

Tide	H 1881-82	1882-83	1883-84	1884-85	Tide
	Feet	Feet	Feet	Feet	
S_1	0·006	0·024	0·006	0·008	S_1
S_2	1·005	1·030	·993	1·000	S_2
S_4	0·007	0·008	·009	0·006	S_4
S_6	·003	·003	·003	·005	S_6
S_8	·003	·003	·004	·005	S_8
M_1	·009	·008	·014	·009	M_1
M_2	2·247	2·253	2·267	2·237	M_2
M_3	0·012	0·016	0·012	0·016	M_3
M_4	·035	·041	·035	·029	M_4
M_6	·006	·014	·014	·004	M_6
M_8	·003	·002	·006	·004	M_8
O	·175	·179	·176	·172	O
K_1	·408	·407	·413	·406	K_1
K_2	·268	·241	·289	·292	K_2
P	·133	·157	·127	·132	P
J	·021	·030	·031	·020	J
Q	·004	·017	·012	·005	Q
L	·068	·050	·068	·095	L
N	·471	·481	·425	·439	N
λ	·045	·081	·019	·066	λ
ν	·163	·120	·036	·136	ν
μ	·070	·080	·069	·042	μ
R	...	·034	...	·014	R
T	...	·017	...	·099	T
MS	·039	·042	·041	·039	MS
2SM	·019	·014	·020	·028	2SM
2N	·080	·075	·066	·050	2N
M_2N	·076	·062	·017	·047	M_2N
M_2K_1	·029	·033	·027	·015	M_2K_1
$2M_2K_1$	·006	·013	·010	·010	$2M_2K_1$
Mm	·053	·072	·045	·014	Mm
Mf	·061	·073	·067	·099	Mf
MSf	·041	·059	·039	·014	MSf
Sa	·746	·840	·841	·888	Sa
Ssa	·364	·210	·282	·260	Ssa

Values of κ's at False-Point.

Tide	κ 1881-82	κ 1882-83	κ 1883-84	κ 1884-85	Tide
	°	°	°	°	
S_1	325·24	47·52	47·55	86·42	S_1
S_2	301·55	304·26	302·09	298·22	S_2
S_4	331·19	326·94	315·96	306·67	S_4
S_6	153·44	185·04	163·30	158·20	S_6
S_8	218·93	261·12	280·54	181·10	S_8
M_1	66·41	354·55	286·59	226·80	M_1
M_2	268·81	271·10	269·40	267·05	M_2
M_3	33·67	26·87	35·98	27·09	M_3
M_4	224·18	235·89	223·90	233·04	M_4
M_6	80·09	46·67	43·84	142·18	M_6
M_8	229·19	262·39	191·97	220·08	M_8
O	335·42	335·24	334·24	333·70	O
K_1	343·65	346·25	343·77	341·23	K_1
K_2	296·45	296·82	307·24	295·23	K_2
P	349·22	339·51	345·62	344·08	P
J	306·02	318·76	329·20	359·46	J
Q	306·91	340·10	311·94	187·36	Q
L	280·88	226·85	265·77	286·15	L
N	265·34	268·12	263·65	258·37	N
λ	276·88	82·96	330·52	272·09	λ
ν	246·84	240·63	304·50	300·58	ν
μ	266·20	279·61	265·21	252·43	μ
R	...	217·22	...	283·66	R
T	...	149·15	...	280·00	T
MS	272·34	274·77	266·28	260·66	MS
2SM	195·98	177·10	189·22	212·73	2SM
2N	248·65	267·67	238·31	240·22	2N
M_2N	17·46	41·39	359·87	26·84	M_2N
M_2K_1	317·08	25·78	100·95	226·83	M_2K_1
$2M_2K_1$	322·40	331·93	345·91	0·61	$2M_2K_1$
Mm	53·15	57·50	114·53	42·90	Mm
Mf	37·43	33·15	12·63	32·42	Mf
MSf	278·80	73·33	157·77	242·10	MSf
Sa	166·12	165·73	172·28	161·65	Sa
Ssa	142·23	149·02	153·59	157·89	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, January 1899.

DUBLAT (SAUGOR ISLAND).

ON THE HOOGHLY RIVER.

(*Tidal Observatory, Lat. 21° 38′ N., Long. 88° 6′ E.*)

The tidal observatory at Dublat, on Saugor Island in the mouth of the Hooghly, was one of the minor observatories at which five years' observations are considered sufficient, and was situated on the western side of the Dublat Creek and about one mile N.E. of the village of that name, in the position shown on the accompanying chart. The observatory, a substantial wooden structure, rested on four stout piles driven fourteen feet into the mud, and was connected with the shore by a plank bridge two hundred feet long. The float-cylinder, twenty-two inches in internal diameter and thirty feet long, giving ample range for extreme tides, passed through and rose three feet above the flooring of the observatory and was supported on posts and secured below by an iron bar fastened to the beams bracing the piles. The communication was through holes bored in the closed bottom of the cylinder.

The working scale of the tide-gauge was one-sixth.

Registrations were commenced on the 23rd April, 1881, and were fairly continuous until their termination, though on one occasion there was a gap of nineteen days owing to the plank bridge being washed away, and there were frequent unimportant stoppages of the pendulum driving clock, due to the vibration of the observatory, which caused short breaks until the clock was replaced by one with spring escapement in December, 1884. A settlement of two and a half inches occurred, caused by the additional weight of some rail bracing added in June, 1885. On the 29th September, 1886, the tidal observatory, with all its contents, was swept away at night by a heavy wind and sea.

The disturbances of the surface of the ocean caused by an earthquake, whose centre lay between Port Blair and Car Nicobar, were recorded at this tidal station by the self-registering tide-gauge on the 31st December, 1881, and those caused by the Krakatoa volcanic eruptions were similarly recorded on the 27th August, 1883.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference is a stone embedded in masonry and inscribed G. T. S. O B. M. A., situated about six hundred and thirty feet south of the site of the tidal observatory at the foot of the main embankment. It is 18·398 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $X^h\ 4^m$.

The highest high water recorded was 24·2 feet above the zero of the gauge, and occurred in September, 1882.

The lowest low water recorded was 5·3 feet above the zero of the gauge, and occurred in March, 1882.

In 1881-82 the mean range of largest ordinary springs was found to be 14·2 feet.

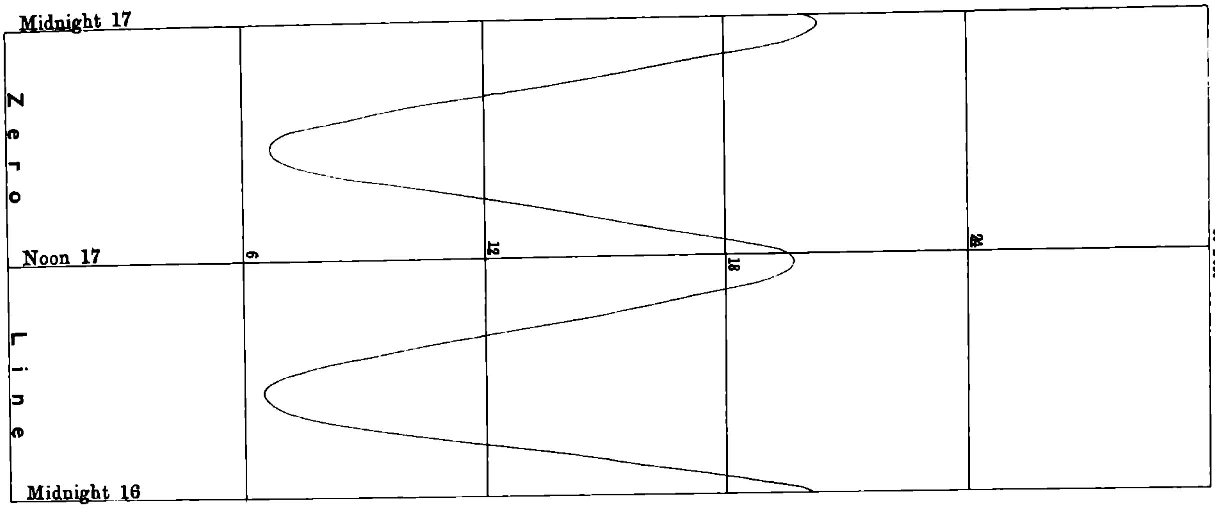
The height of mean-sea-level above the zero of the gauge had the following values:—

1881-82	...	...	...	14·394 feet.
1882-83	...	...	...	14·499 „
1883-84	...	...	...	14·417 „
1884-85	...	...	...	14·379 „
1885-86	...	...	...	14·263 „

NOTE.—The level of the zero of the gauge at Dublat is 6·222 feet below that of the zeros of the gauges at Diamond Harbour and Kidderpore.

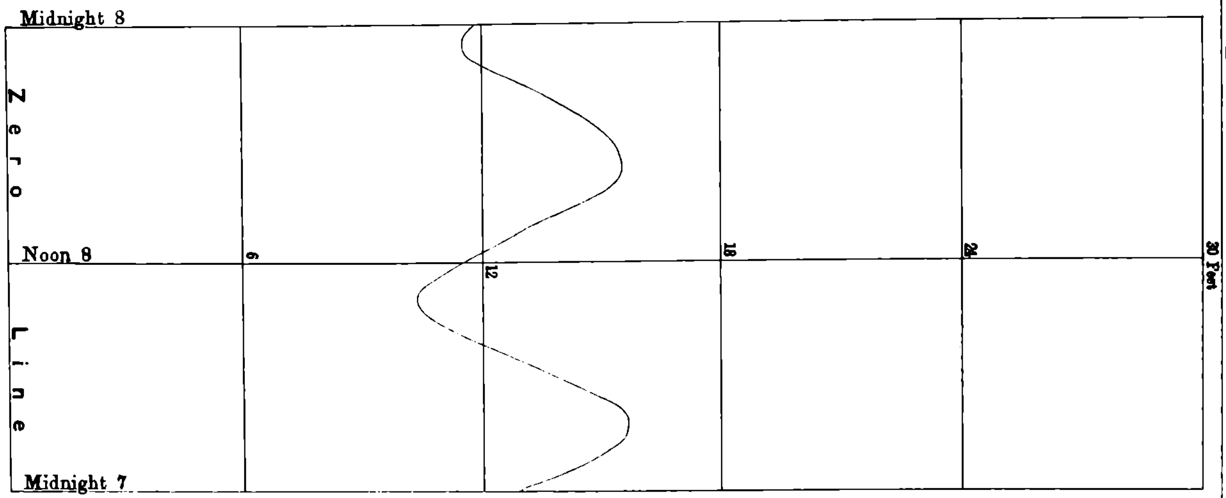
TIDAL CURVES
at
DUBLAT (Saugor Island)

Spring Tide — 17th February 1885



New Moon — 15th February 1885

Neap Tide — 8th February 1885



Last Quarter — 6th February 1885

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun, August 1899.

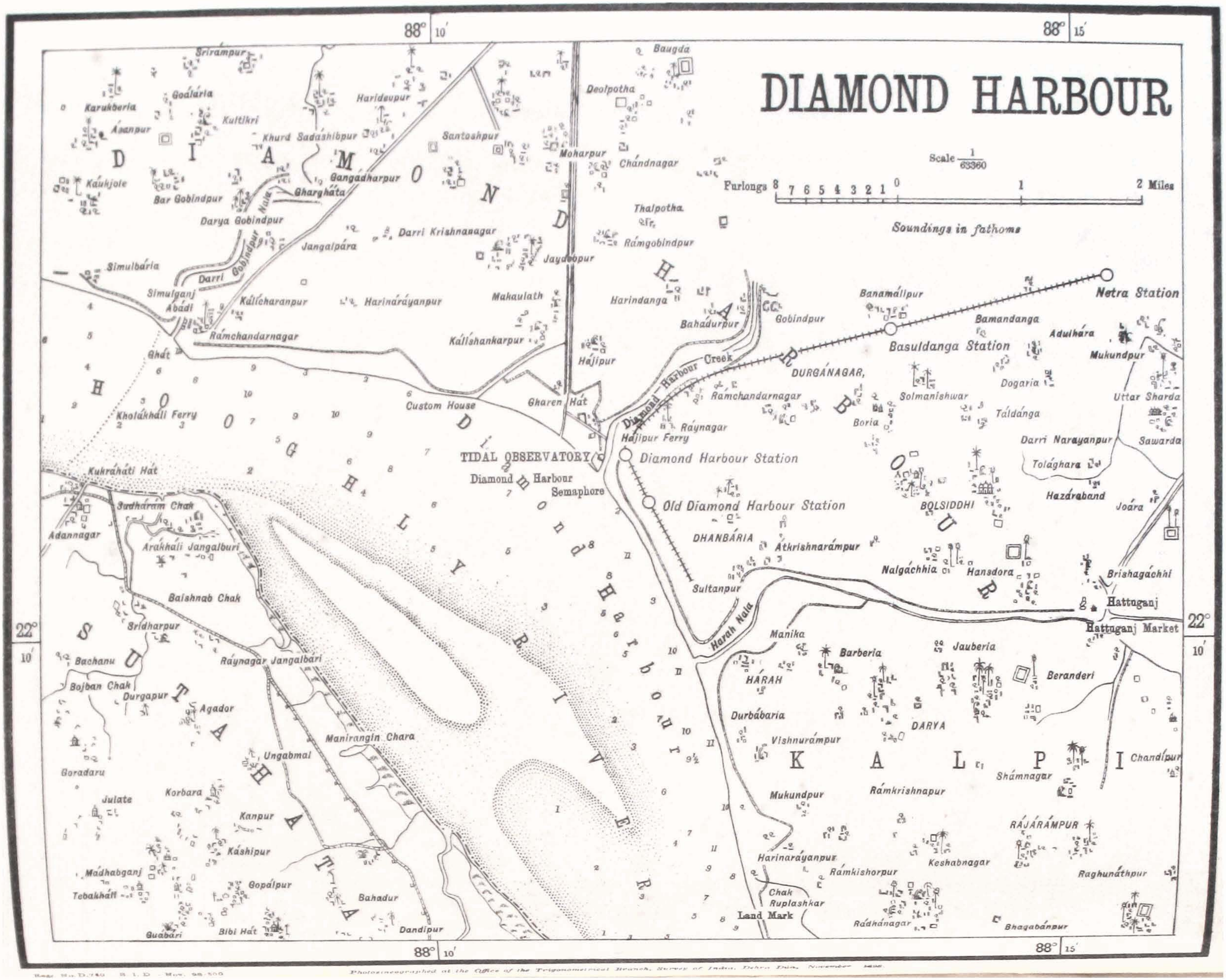
Regr. No. D. 204, S. I. D. - July 99-500

Values of H's *at Dublat.*

Tide	H 1881-82	1882-83	1883-84	1884-85	1885-86	Tide
	Feet	Feet	Feet	Feet	Feet	
S_1	0·044	0·050	0·040	0·047	0·047	S_1
S_2	2·053	2·163	2·147	2·071	2·099	S_2
S_4	0·025	0·011	0·017	0·015	0·011	S_4
S_6	·002	·005	·005	·001	·002	S_6
S_8	·004	·007	·003	·002	·009	S_8
M_1	·008	·007	·017	·024	·027	M_1
M_2	4·623	4·596	4·594	4·626	4·603	M_2
M_3	0·049	0·043	0·051	0·048	0·049	M_3
M_4	·101	·089	·081	·086	·081	M_4
M_6	·014	·013	·008	·013	·007	M_6
M_8	·014	·009	·012	·006	·009	M_8
O	·181	·197	·186	·183	·196	O
K_1	·498	·488	·503	·490	·493	K_1
K_2	·573	·618	·599	·634	·691	K_2
P	·158	·151	·141	·156	·148	P
J	·031	·016	·022	·053	·033	J
Q	·010	·008	·013	·012	·010	Q
L	·175	·158	·210	·170	·245	L
N	1·041	·852	·820	·875	·882	N
λ	0·298	·139	·085	·063	·163	λ
ν	·271	·192	·142	·276	·328	ν
μ	·218	·111	·172	·107	·141	μ
R	...	·219	...	·095	...	R
T	...	·137	...	·175	...	T
MS	·094	·059	·067	·074	·077	MS
2SM	·097	·046	·053	·058	·044	2SM
2N	·207	·124	·096	·200	·147	2N
M_2N	·088	·094	·172	·050	·198	M_2N
M_2K_1	·090	·070	·023	·053	·072	M_2K_1
$2M_2K_1$	·033	·032	·028	·050	·031	$2M_2K_1$
Mm	·045	·035	·060	·027	·020	Mm
Mf	·056	·039	·092	·086	·032	Mf
MSf	·049	·077	·050	·027	·042	MSf
Sa	·796	1·003	·864	·930	·787	Sa
Ssa	·234	0·182	·202	·211	·146	Ssa

Values of κ's at Dublat.

TIDE	κ 1881-82	1882-83	1883-84	1884-85	1885-86	TIDE
	°	°	°	°	°	
S_1	99·12	120·94	142·28	124·40	131·20	S_1
S_2	326·81	326·29	328·84	326·36	330·45	S_2
S_4	202·44	219·54	201·23	255·12	237·49	S_4
S_6	120·47	78·23	40·24	59·04	259·38	S_6
S_8	115·94	110·35	88·26	58·39	129·89	S_8
M_1	344·54	96·83	62·44	264·52	291·07	M_1
M_2	290·10	289·67	290·49	290·38	293·80	M_2
M_3	131·12	134·96	138·02	132·61	136·53	M_3
M_4	142·52	144·83	148·83	148·94	159·65	M_4
M_6	274·98	235·85	249·69	165·08	180·69	M_6
M_8	315·90	273·02	279·22	302·24	298·43	M_8
O	332·09	335·44	342·23	343·00	335·68	O
K_1	353·36	350·31	351·62	350·29	353·56	K_1
K_2	310·19	325·25	328·38	332·77	327·33	K_2
P	335·50	350·64	347·41	350·11	349·66	P
J	351·62	296·42	307·33	2·05	17·33	J
Q	305·51	0·81	10·96	312·40	57·70	Q
L	290·56	291·81	295·09	299·65	301·84	L
N	284·86	286·37	285·06	282·67	286·51	N
λ	339·00	292·51	261·20	276·85	325·19	λ
ν	260·94	240·22	294·91	302·68	276·15	ν
μ	10·10	19·01	14·11	355·12	9·96	μ
R	...	288·94	...	306·69	...	R
T	...	299·43	...	60·70	...	T
MS	171·25	138·91	173·83	177·20	191·00	MS
2SM	194·72	226·91	193·00	198·08	196·20	2SM
2N	271·70	297·04	221·44	252·65	263·53	2N
M_2N	310·22	238·61	55·23	70·14	19·88	M_2N
M_2K_1	193·14	246·22	353·34	141·58	191·61	M_2K_1
$2M_2K_1$	151·14	146·72	125·09	124·28	97·06	$2M_2K_1$
Mm	29·34	125·40	75·39	43·17	171·00	Mm
Mf	60·95	70·93	45·93	34·48	85·92	Mf
MSf	277·68	74·99	128·16	233·84	25·57	MSf
Sa	146·93	154·05	152·91	145·51	153·64	Sa
Ssa	162·17	109·69	133·60	161·91	136·80	Ssa


DIAMOND HARBOUR
Scale 1/63360
Furlongs 8 7 6 5 4 3 2 1 0 1 2 Miles
Soundings in fathoms
88° 10′
88° 15′
22° 10′
Netra Station
Basuldanga Station
Diamond Harbour Station
Old Diamond Harbour Station
TIDAL OBSERVATORY
Diamond Harbour Semaphore
Custom House
Gharen Hat
Hajipur Ferry
Kholakhali Ferry
Kukrahati Hat
Diamond Harbour Creek
Harah Nala
Hattuganj
Hattuganj Market
Land Mark
HOOGHLY RIVER
Diamond Harbour
DIAMOND HARBOUR
KALPI
SUTAHATA
Srirampur
Goalaria
Karukberia
Asanpur
Kaukjole
Bar Gobindpur
Kultikri
Khurd Sadashibpur
Harideupur
Gangadharpur
Gharghata
Darya Gobindpur
Simulbaria
Simulganj
Abadi
Ghat
Jangalpara
Darri Krishnanagar
Kalicharanpur
Harinarayanpur
Ramchandarnagar
Santoshpur
Moharpur
Jaydebpur
Mahaulath
Kalishankarpur
Baugda
Deolpotha
Chandnagar
Thalpotha
Ramgobindpur
Harindanga
Hajipur
Bahadurpur
Gobindpur
Banamalipur
Bamandanga
Aduihara
Mukundpur
Durganagar
Ramchandarnagar
Raynagar
Boria
Solmanishwar
Dogaria
Taldanga
Uttar Sharda
Darri Narayanpur
Sawarda
Tolaghara
Hazraband
Joara
Bolsiddhi
Dhanbaria
Atkrishnarampur
Sultanpur
Nalgachhia
Hansdora
Brishagachhi
Manika
Harah
Barberia
Jauberia
Beranderi
Durbabaria
Darya
Vishnurampur
Chandipur
Shamnagar
Mukundpur
Ramkrishnapur
Rajarampur
Harinarayanpur
Ramkishorpur
Keshabnagar
Raghunathpur
Chak Ruplashkar
Radhanagar
Bhagabanpur
Adannagar
Sudharam Chak
Arakhali Jangalburi
Baishnab Chak
Sridharpur
Raynagar Jangalbari
Bachanu
Bojban Chak
Durgapur
Agador
Manirangin Chara
Ungabmal
Goradaru
Julate
Korbara
Kanpur
Kashipur
Madhabganj
Tobakhali
Gopalpur
Bahadur
Guabari
Bibi Hat
Dandipur

DIAMOND HARBOUR.

On the Hooghly River.

(Tidal Observatory, Lat. 22° 11′ N., Long. 88° 12′ E.)

The tidal observatory at Diamond Harbour, about forty miles below Calcutta on the left bank of the Hooghly and about halfway between Kidderpore and Dublat, was one of the minor observatories at which five years' observations are considered sufficient, and was situated on the west side of the Diamond Harbour Creek in the position shown on the accompanying chart. It was a substantial wooden cabin built on the piles of a former observatory. The float-cylinder, thirty feet in length, which gave ample range for extreme tides, passed through and was secured to the flooring, above which it rose three and a half feet, and was also bound to the frame-work supporting the observatory by an iron band halfway down. The communication was through holes bored in the closed bottom of the cylinder.

The working scale of the tide-gauge was one-sixth.

Registrations were commenced on the 4th April, 1881, and, in spite of frequent stoppages of the clock due to vibration, were tolerably satisfactory until the beginning of August, 1885, when, during very heavy freshets, the observatory gave way and tilted on one side. The instruments were removed, and the repairs were completed and registrations resumed by the end of the same month. On the 12th April, 1886, the observations, which during the seven preceding months had become more and more frequently interrupted by vibration, were concluded; and the observatory, which during the same period had been growing dangerously unstable and had settled five inches, was dismantled.

The disturbances of the surface of the ocean, caused by the Krakatoa volcanic eruptions, were recorded at this tidal station by the self-registering tide-gauge on the 27th August, 1883.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference bears in its centre the inscription G. T. S. O B. M. A., and is situated two hundred and ten feet west of the site of the tidal observatory, just below the embankment near its junction with the path leading to the burial ground. It is 19·882 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = XI^{h} 55^{m}.

The highest high water recorded was 21·8 feet above the zero of the gauge, and occurred in August, 1885.

The lowest low water recorded was 0·4 foot *below* the zero of the gauge, and occurred in February, 1886.

In 1881-82 the mean range of largest ordinary springs was found to be 15·8 feet.

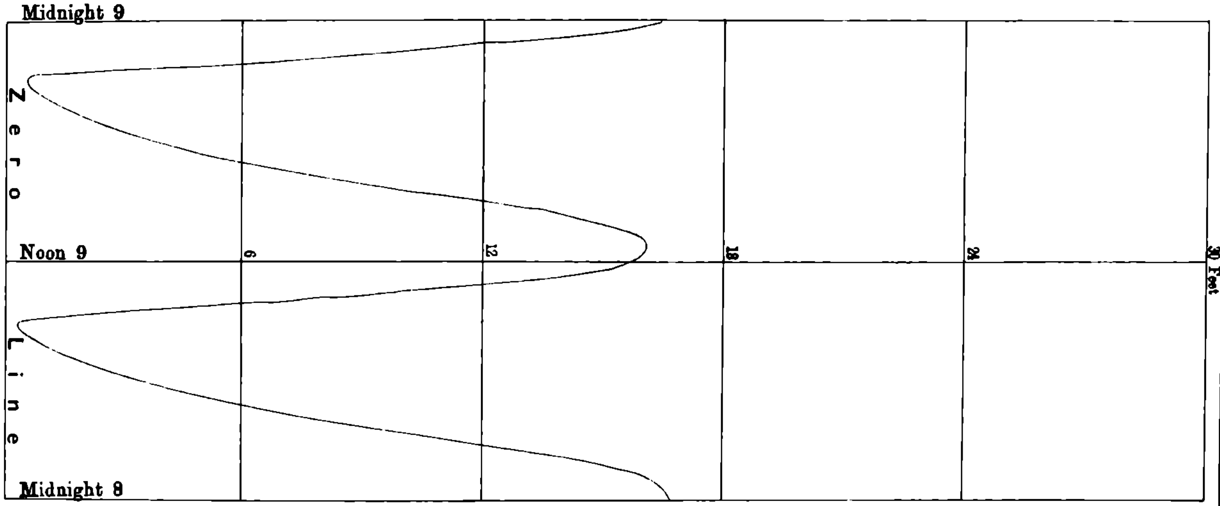
The height of mean-water-level above the zero of the gauge had the following values :—

1881-82	...	...	...	8·976 feet.
1882-83	...	...	...	9·011 „
1883-84	...	...	...	8·999 „
1884-85	...	...	...	8·897 „
1885-86	...	...	...	8·804 „

NOTE.—The level of the zero of the gauge at Diamond Harbour is identical with that of the zero of the gauge at Kidderpore, and is 6·222 feet above that of the zero of the gauge at Dublat.

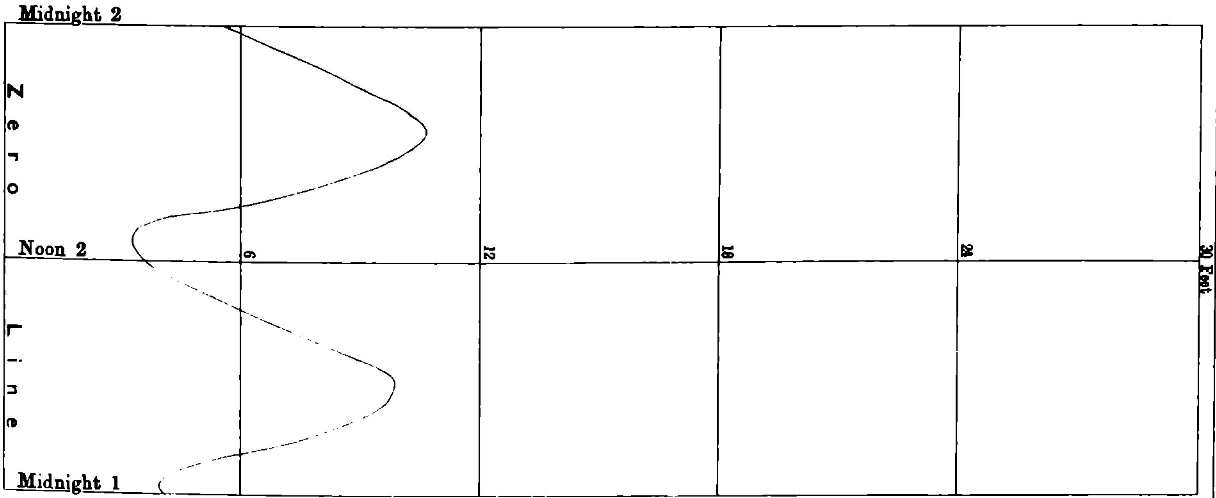
TIDAL CURVES
at
DIAMOND HARBOUR

Spring Tide — 9th February 1883



New Moon — 7th February 1883

Neap Tide — 2nd February 1883



Last Quarter — 31st January 1883

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. September 1899.

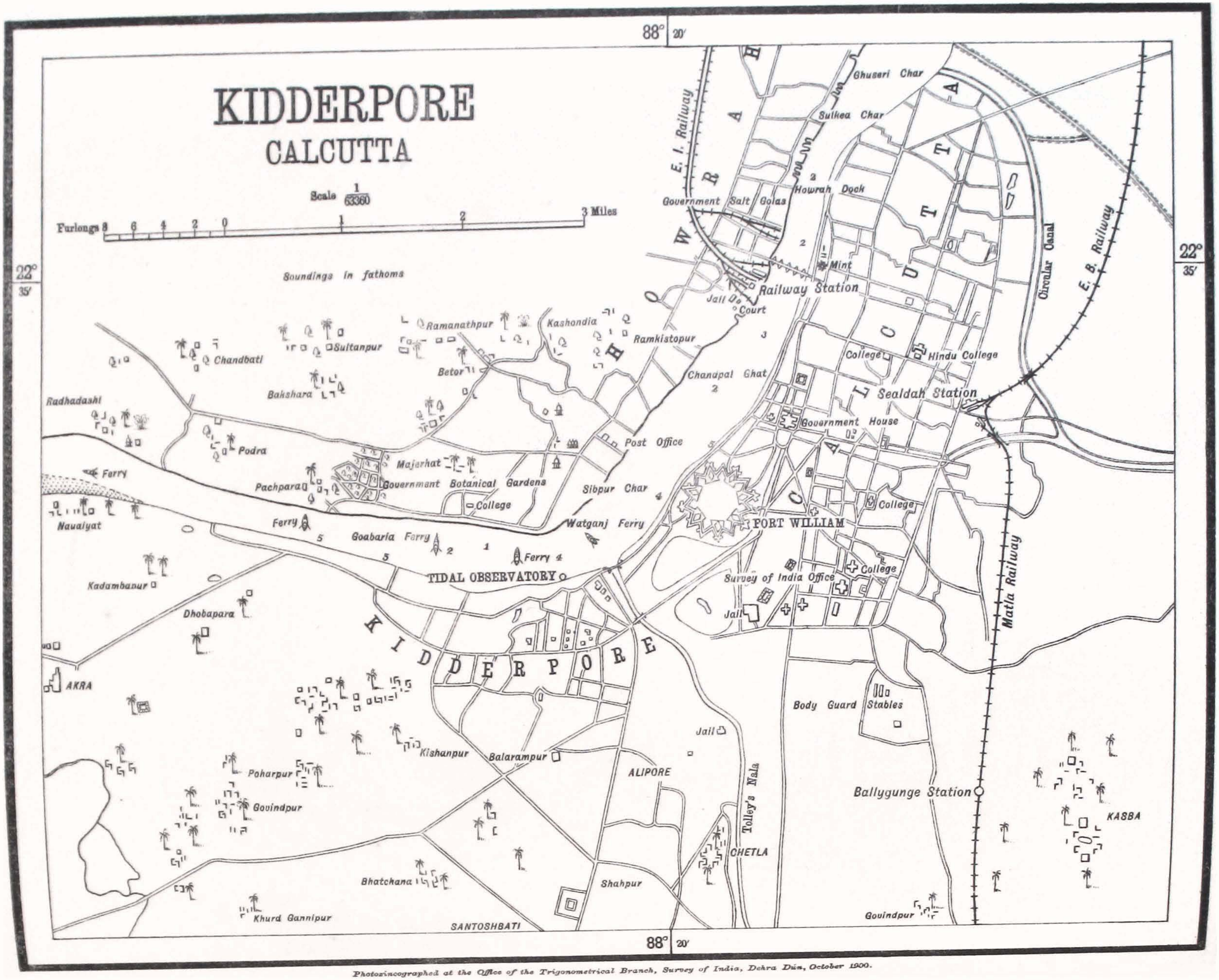
Regr. No. D.245, S. T. D. - Aug. 99 - 500

Values of H's *at Diamond Harbour.*

Tide	H					Tide
	1881-82	1882-83	1883-84	1884-85	1885-86	
	Feet	Feet	Feet	Feet	Feet	
S_1	0·082	0·088	0·093	0·092	0·101	S_1
S_2	2·215	2·288	2·252	2·202	2·199	S_2
S_4	0·117	0·122	0·132	0·123	0·123	S_4
S_6	·013	·013	·015	·013	·006	S_6
S_8	·002	·004	·004	·007	·002	S_8
M_1	·020	·020	·022	·052	·032	M_1
M_2	5·175	5·179	5·177	5·135	5·154	M_2
M_3	0·042	0·028	0·061	0·062	0·058	M_3
M_4	·756	·734	·752	·753	·765	M_4
M_6	·156	·148	·163	·141	·144	M_6
M_8	·065	·058	·060	·053	·053	M_8
O	·237	·230	·211	·217	·233	O
K_1	·499	·492	·508	·498	·515	K_1
K_2	·667	·644	·730	·718	·622	K_2
P	·176	·174	·173	·184	·171	P
J	·029	·033	·006	·035	·045	J
Q	·024	·036	·036	·019	·016	Q
L	·174	·347	·201	·280	·276	L
N	·988	·914	·898	·945	1·030	N
λ	·171	·058	·046	·192	0·267	λ
ν	·420	·186	·204	·387	·203	ν
μ	·272	·333	·298	·338	·268	μ
R	...	·216	...	·175	...	R
T	...	·078	...	·317	...	T
MS	·687	·702	·702	·728	·709	MS
2SM	·095	·053	·058	·069	·074	2SM
2N	·138	·076	·212	·167	·147	2N
M_2N	·200	·088	·100	·085	·116	M_2N
M_2K_1	·130	·065	·124	·159	·107	M_2K_1
$2M_2K_1$	·067	·050	·066	·059	·065	$2M_2K_1$
Mm	·147	·057	·156	·145	·078	Mm
Mf	·157	·142	·216	·155	·096	Mf
MSf	·401	·501	·453	·424	·483	MSf
Sa	1·011	1·189	·980	·991	1·119	Sa
Ssa	0·023	0·109	·103	·069	0·182	Ssa

Values of κ's at Diamond Harbour.

Tide	κ 1881-82	1882-83	1883-84	1884-85	1885-86	Tide
	°	°	°	°	°	
S_1	156·14	147·38	149·53	161·09	162·94	S_1
S_2	26·06	25·14	26·15	26·49	25·98	S_2
S_4	328·35	323·01	330·30	328·73	326·18	S_4
S_6	266·42	234·83	267·73	269·56	233·13	S_6
S_8	304·70	41·50	240·64	285·95	175·03	S_8
M_1	87·65	103·07	145·06	202·53	277·22	M_1
M_2	344·81	343·56	344·30	344·71	344·82	M_2
M_3	219·54	225·47	244·68	237·14	224·72	M_3
M_4	246·42	245·36	246·27	249·01	249·81	M_4
M_6	106·44	104·98	105·93	112·37	110·03	M_6
M_8	347·24	343·26	343·91	348·72	354·04	M_8
O	344·11	345·98	342·12	350·44	348·26	O
K_1	14·99	13·83	15·50	14·32	13·49	K_1
K_2	19·58	26·50	24·65	22·76	30·05	K_2
P	6·13	11·57	8·61	11·94	11·16	P
J	299·22	339·95	67·95	28·37	24·04	J
Q	8·89	9·66	304·32	301·12	43·56	Q
L	356·98	344·19	335·29	344·23	8·11	L
N	339·18	339·74	335·80	335·79	347·01	N
λ	18·73	296·13	22·48	356·71	358·05	λ
ν	293·85	284·10	346·13	330·53	299·30	ν
μ	79·18	89·95	90·05	82·05	85·34	μ
R	...	9·60	...	16·53	...	R
T	...	55·45	...	86·44	...	T
MS	285·58	283·67	287·52	288·57	288·26	MS
2SM	251·34	289·79	273·77	271·17	289·76	2SM
2N	343·33	42·64	287·50	313·80	321·11	2N
M_2N	31·77	62·68	71·01	25·04	67·71	M_2N
M_2K_1	294·89	283·72	249·04	278·74	300·80	M_2K_1
$2M_2K_1$	226·71	224·58	214·03	220·25	200·75	$2M_2K_1$
Mm	11·65	351·22	25·72	16·59	2·94	Mm
Mf	36·00	41·48	57·21	40·40	33·23	Mf
MSf	25·74	40·25	40·61	36·15	29·36	MSf
Sa	139·77	146·81	140·81	142·83	140·31	Sa
Ssa	64·21	76·79	91·82	150·10	262·35	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, October 1900.

KIDDERPORE (CALCUTTA).

ON THE HOOGHLY RIVER.

(*Tidal Observatory, Lat. 22° 32′ N., Long. 88° 20′ E.*)

The tidal observatory at Kidderpore in Calcutta is one of the permanent observatories, and is situated on the south or left side of the Hooghly, well out in the stream, just below and close to the main entrance of the Kidderpore New Dock, in the position shown on the accompanying chart. It is a substantial wooden cabin resting on stout piles driven firmly into the mud, and reached by a roadway constructed on the protecting piles of the dock-entrance. The float-cylinder, twenty-four inches in internal diameter and thirty feet long, giving ample range for extreme tides, is supported by the floor of the observatory, through which it rises, and is also securely attached to the frame-work of the supporting piles. The communication is by holes bored in the closed bottom of the cylinder; and there is a man-hole near the bottom of the cylinder for clearing out any accumulation of mud.

The working scale of the tide-gauge is one-sixth.

Registrations were commenced on the 22nd March, 1881, and have been continued satisfactorily without any serious interruption up to the present. On the 10th May, 1881, a sudden and very violent gale tore off the roof of the observatory, but caused no material gap in the registrations. Throughout the period of the observations the clock has experienced short stoppages through vibration of the observatory, which have caused insignificant breaks in the tidal curves: of late these stoppages have been considerably less frequent.

The disturbances of the surface of the ocean, caused by the Krakatoa volcanic eruptions, were recorded at this tidal station by the self-registering tide-gauge on the 27th August, 1883.

Barometrical and anemometrical observations have been carried on simultaneously with the tidal observations. The barometer was placed in the observatory, and the anemometer was at first set up on a neighbouring Sail Loft; but in 1887 this building was taken down during dockyard alterations, and the anemometer was then transferred to the top of the tidal observatory.

The bench-mark of reference consists of the inscription G. T. S. O B. M. A, engraved on the coping of the west wall of the main entrance of the Kidderpore New Dock, ten and a half feet north of the Swing Bridge. It is 23·928 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $II^h\ 2^m$.

The highest high water recorded was 24·1 feet above the zero of the gauge, and occurred in August, 1890.

The lowest low water recorded was 2·2 feet above the zero of the gauge, and occurred in February, 1882.

In 1881-82 the mean range of largest ordinary springs was found to be 11·7 feet.

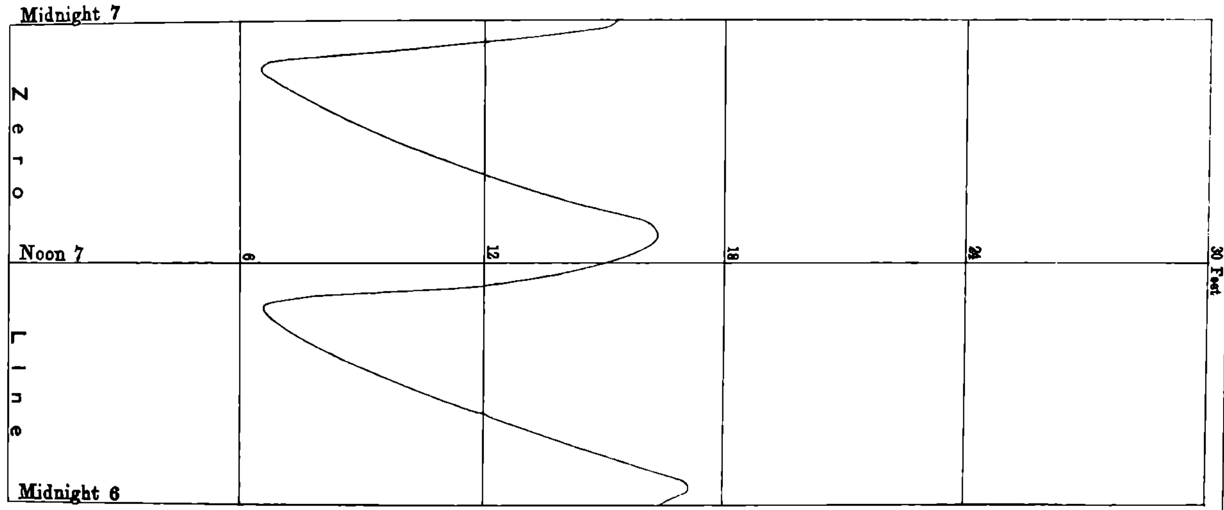
The height of mean-water-level above the zero of the gauge had the following values:—

1881-82	10·739 feet.
1882-83	10·686 „
1883-84	10·599 „
1884-85	10·669 „
1885-86	10·950 „
1886-87	11·383 „
1887-88	11·080 „
1888-89	10·842 „
1889-90	11·232 „
1890-91	11·364 „
1891-92	10·618 „

NOTE.—The level of the zero of the gauge at Kidderpore is identical with that of the zero of the gauge at Diamond Harbour, and is 6·222 feet above that of the zero of the gauge at Dublat.

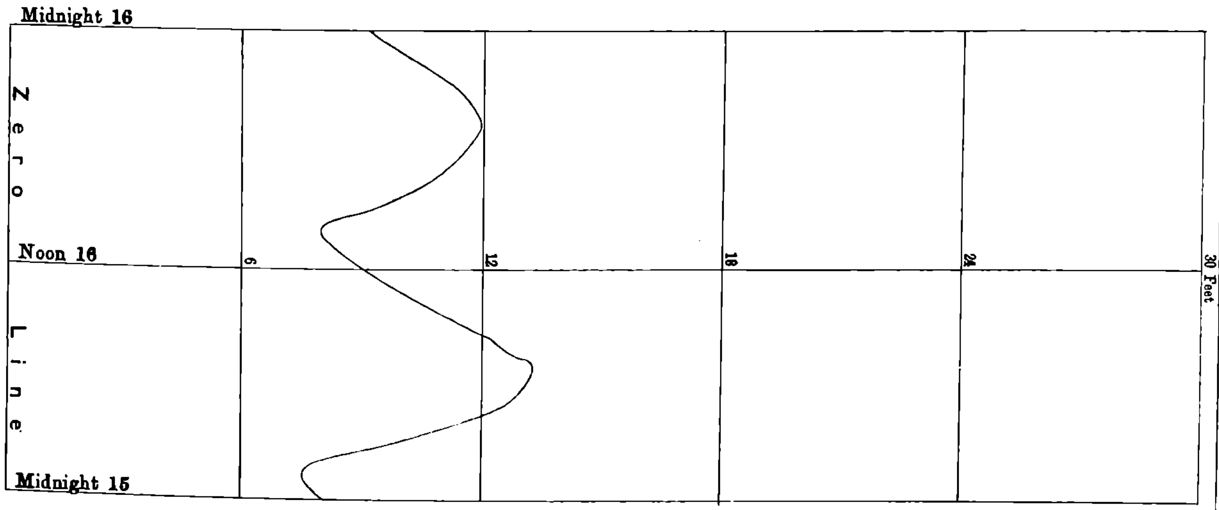
TIDAL CURVES
at
KIDDERPORE (Calcutta)

Spring Tide —— 7th November 1889



Full Moon —— 7th November 1889

Neap Tide —— 16th November 1889



Last Quarter —— 15th November 1889

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Regr. No. D. 264. S. I. D. - Aug. 99 - 500

Values of H's *at Kidderpore.*

Tide	H 1881-82	H 1882-83	H 1883-84	H 1884-85	H 1885-86	Tide
	Feet	Feet	Feet	Feet	Feet	
S_1	0·094	0·088	0·097	0·082	0·088	S_1
S_2	1·427	1·508	1·513	1·462	1·459	S_2
S_4	0·066	0·084	0·095	0·080	0·074	S_4
S_6	·006	·004	·003	·001	·008	S_6
S_8	·006	·009	·002	·007	·005	S_8
M_1	·012	·013	·034	·052	·051	M_1
M_2	3·593	3·660	3·646	3·674	3·627	M_2
M_3	0·012	0·018	0·028	0·043	0·060	M_3
M_4	·734	·719	·691	·729	·736	M_4
M_6	·158	·160	·156	·156	·161	M_6
M_8	·074	·082	·073	·067	·065	M_8
O	·228	·211	·206	·210	·209	O
K_1	·390	·387	·400	·398	·394	K_1
K_2	·439	·431	·504	·489	·381	K_2
P	·146	·142	·140	·153	·132	P
J	·016	·012	·017	·031	·011	J
Q	·039	·039	·036	·034	·016	Q
L	·201	·173	·222	·151	·221	L
N	·677	·599	·628	·662	·675	N
λ	·126	·075	·091	·055	·098	λ
ν	·323	·152	·170	·318	·320	ν
μ	·224	·260	·294	·220	·206	μ
R	...	·167	...	·123	...	R
T	...	·147	...	·175	...	T
MS	·646	·643	·645	·625	·654	MS
2SM	·084	·086	·063	·066	·096	2SM
2N	·079	·038	·124	·127	·099	2N
M_2N	·033	·184	·108	·105	·043	M_2N
M_2K_1	·086	·125	·144	·085	·082	M_2K_1
$2M_2K_1$	·036	·034	·032	·032	·040	$2M_2K_1$
Mm	·316	·172	·290	·288	·269	Mm
Mf	·301	·293	·346	·238	·317	Mf
MSf	·829	·920	·905	·834	·981	MSf
Sa	2·809	2·670	2·312	2·361	3·006	Sa
Ssa	0·935	0·708	0·714	0·651	1·307	Ssa

Values of H's *at Kidderpore*—(Continued).

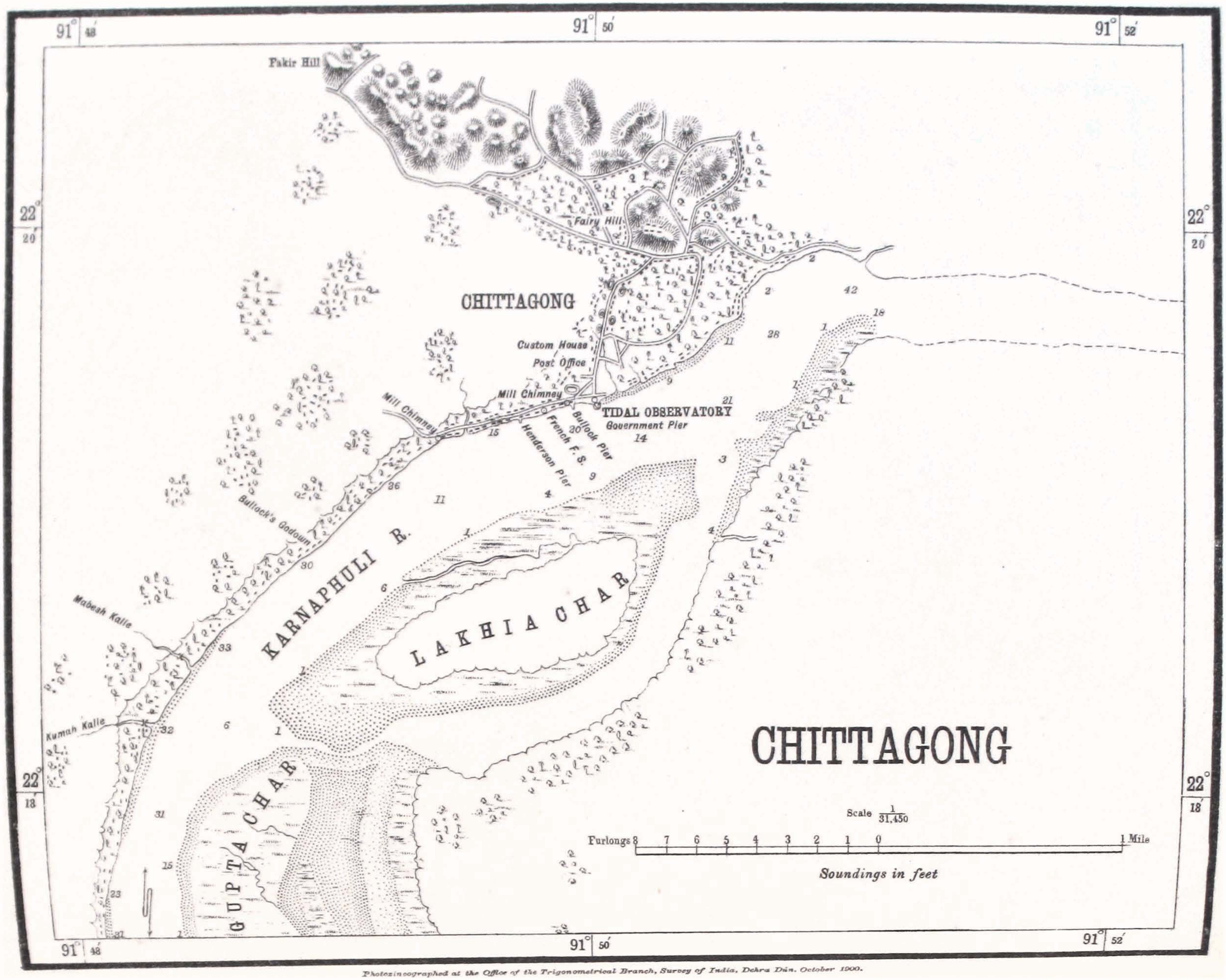
Tide	H						Tide
	1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·082	0·077	0·091	0·087	0·081	0·086	S_1
S_2	1·482	1·490	1·496	1·520	1·498	1·541	S_2
S_4	0·093	0·093	0·094	0·099	0·093	0·108	S_4
S_6	·005	·004	·001	·002	·003	·003	S_6
S_8	·003	·002	·001	·001	·004	·002	S_8
M_1	·039	·030	·028	·033	·010	·011	M_1
M_2	3·521	3·568	3·720	3·638	3·572	3·645	M_2
M_3	0·056	0·055	0·046	0·030	0·024	0·016	M_3
M_4	·714	·735	·779	·742	·743	·755	M_4
M_6	·144	·156	·163	·145	·147	·154	M_6
M_8	·070	·073	·080	·056	·066	·064	M_8
O	·194	·206	·213	·210	·200	·209	O
K_1	·384	·383	·406	·390	·385	·383	K_1
K_2	·451	·474	·411	·413	·427	·502	K_2
P	·136	·151	·120	·133	·120	·151	P
J	·004	·026	·044	·009	·005	·022	J
Q	·011	·027	·026	·034	·041	·022	Q
L	·210	·304	·152	·175	·172	·279	L
N	·649	·646	·737	·727	·690	·638	N
λ	...	...	...	...	...	...	λ
ν	·185	·133	·256	·341	·282	·133	ν
μ	·203	·231	·194	·222	·224	·275	μ
R	...	...	...	...	...	...	R
T	·127	·046	·176	·180	·115	·093	T
MS	·651	·653	·682	·694	·682	·706	MS
2SM	·089	·079	·071	·063	·071	·086	2SM
2N	·059	·100	·090	·145	·102	·041	2N
M_2N	·146	·105	·068	·056	·149	·119	M_2N
M_2K_1	·123	·147	·099	·078	·135	·139	M_2K_1
$2M_2K_1$	·028	·033	·032	·020	·032	·038	$2M_2K_1$
Mm	·287	·251	·314	·311	·404	·323	Mm
Mf	·263	·260	·243	·221	·260	·205	Mf
MSf	·979	·907	·901	·982	·893	·900	MSf
Sa	3·114	2·874	2·810	2·837	3·554	2·527	Sa
Ssa	1·092	0·711	1·289	0·900	1·177	0·751	Ssa

Values of κ's at Kidderpore.

Tide	κ					Tide
	1881-82	1882-83	1883-84	1884-85	1885-86	
	°	°	°	°	°	
S_1	196·96	189·51	193·42	200·48	204·50	S_1
S_2	101·81	100·52	102·95	103·66	102·45	S_2
S_4	126·45	110·68	124·12	118·10	116·88	S_4
S_6	266·37	331·70	58·67	194·04	340·40	S_6
S_8	297·76	323·26	227·29	235·01	285·35	S_8
M_1	112·04	201·79	177·81	260·29	334·75	M_1
M_2	58·53	57·64	57·88	59·87	60·35	M_2
M_3	334·89	327·72	350·26	343·98	332·75	M_3
M_4	38·59	35·49	36·03	40·34	42·07	M_4
M_6	322·56	314·87	310·40	325·37	330·81	M_6
M_8	275·82	263·27	267·59	273·46	284·33	M_8
O	21·76	19·70	15·58	23·30	22·86	O
K_1	57·53	53·51	55·31	55·02	56·90	K_1
K_2	90·28	100·73	103·14	98·13	94·88	K_2
P	41·95	52·32	49·09	51·03	40·01	P
J	355·21	297·90	317·00	50·10	82·12	J
Q	357·58	19·74	349·87	350·28	14·40	Q
L	86·39	61·76	59·20	62·61	73·69	L
N	47·92	46·23	42·03	44·99	47·08	N
λ	130·99	83·53	43·54	72·92	134·35	λ
ν	357·93	348·97	61·53	44·43	12·81	ν
μ	173·97	189·97	180·71	182·65	191·47	μ
R	...	77·09	...	79·34	...	R
T	...	107·11	...	184·34	...	T
MS	82·01	80·29	82·46	84·92	85·00	MS
2SM	354·95	8·66	14·75	12·64	16·67	2SM
2N	25·71	103·53	354·88	34·36	8·24	2N
M_2N	256·66	219·12	293·39	227·61	130·84	M_2N
M_2K_1	17·19	21·18	38·86	60·96	26·31	M_2K_1
$2M_2K_1$	341·65	337·88	296·10	324·49	301·02	$2M_2K_1$
Mm	0·38	340·65	21·89	12·25	18·11	Mm
Mf	41·08	35·65	53·58	53·71	34·36	Mf
MSf	34·52	42·94	46·64	42·95	40·31	MSf
Sa	157·08	157·22	149·80	161·90	160·71	Sa
Ssa	204·56	333·63	321·58	353·22	328·33	Ssa

Values of κ's at Kidderpore—(Continued).

TIDE	κ						TIDE
	1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	
	°	°	°	°	°	°	
S_1	196·91	208·00	201·49	184·76	195·60	198·63	S_1
S_2	98·21	100·51	100·17	98·45	97·39	99·47	S_2
S_4	107·99	114·01	109·94	113·79	112·92	105·95	S_4
S_6	40·97	70·64	339·44	104·62	101·69	65·86	S_6
S_8	297·47	255·38	212·47	236·31	187·13	246·04	S_8
M_1	354·68	28·72	32·78	68·30	163·96	141·53	M_1
M_2	58·06	57·99	58·07	55·97	56·55	56·92	M_2
M_3	314·58	310·91	285·64	269·52	294·85	323·58	M_3
M_4	39·61	39·16	37·78	33·71	35·52	36·45	M_4
M_6	324·11	323·14	323·33	322·92	328·58	323·91	M_6
M_8	276·51	276·67	271·16	262·33	288·72	274·10	M_8
O	22·65	18·41	24·16	25·17	23·86	21·55	O
K_1	54·17	50·56	53·33	55·40	53·50	53·53	K_1
K_2	96·23	98·06	90·05	94·09	91·67	94·51	K_2
P	40·22	46·03	40·19	42·32	43·34	40·60	P
J	274·02	351·01	31·10	58·00	62·25	348·89	J
Q	349·45	8·57	356·58	354·06	351·07	356·69	Q
L	65·45	65·84	55·41	74·15	71·21	97·67	L
N	44·84	41·97	39·83	42·81	49·27	43·83	N
λ	...	...	...	...	...	...	λ
ν	2·68	28·59	56·79	20·07	1·87	4·68	ν
μ	203·07	190·99	186·34	186·12	190·44	189·20	μ
R	...	...	...	...	...	...	R
T	87·49	176·27	167·03	115·26	75·49	179·74	T
MS	81·57	82·38	81·15	75·68	78·08	78·63	MS
2SM	17·17	26·51	25·64	12·52	7·22	15·61	2SM
2N	37·06	21·43	22·17	9·51	43·49	53·46	2N
M_2N	235·19	257·44	245·27	172·93	255·57	262·21	M_2N
M_2K_1	20·98	32·09	49·42	18·67	20·94	38·41	M_2K_1
$2M_2K_1$	262·16	286·98	292·51	341·63	317·92	335·63	$2M_2K_1$
Mm	353·10	359·79	5·28	354·27	355·98	9·20	Mm
Mf	19·21	13·37	37·49	21·49	18·68	27·23	Mf
MSf	40·73	45·72	41·49	44·24	41·37	43·94	MSf
Sa	162·83	149·00	153·53	159·25	153·49	152·69	Sa
Ssa	345·27	337·21	332·55	336·53	329·46	340·25	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dūn. October 1900.

CHITTAGONG.

(Tidal Observatory, Lat. 22° 20′ N., Long. 91° 50′ E.)

The tidal observatory at Chittagong, at the northern extremity of the eastern shore of the Bay of Bengal, was one of the minor observatories at which five years' observations are considered sufficient, and stood on the west side of the head of the iron jetty at the town of Chittagong, on the north or right bank of the river Karnaphuli, ten and three-quarter miles from its mouth, in the position shown on the accompanying chart. The observatory, which was that previously used at Diamond Harbour, was firmly bolted to the flooring of the jetty. The float-cylinder was of iron, twenty-four inches in diameter and thirty-two feet long. The top was two feet four inches above the floor of the observatory and about seven feet above the highest tides, and the bottom was three feet above the bed of the river and about six feet below the lowest tides. The cylinder was secured to the girders of the jetty by iron bands in four places, and by a chain about nine feet from the bottom; and chains were stretched from pile to pile under the jetty to defend the cylinder from damage by timber brought down the river by the ebb-tide which here flows with great strength. The communication was through a number of holes, about an inch in diameter, drilled just above the lowest flange and in the closed bottom of the cylinder.

The working scale of the tide-gauge was one-fourth.

Registrations were commenced on the 6th June, 1886, and continued satisfactorily until the observatory was dismantled on the 22nd July, 1891, on the completion of five years' observations. The only fault to be found with the tide-gauge apparatus was the somewhat variable rate of the driving clock, which occasionally led to small corrections having to be made on the diagrams.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference is the Bench-mark A, which is indicated by a circle inscribed on the upper surface of a three-foot cube of masonry built near the S.E. corner of the Port and Customs Office. It is 22·702 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = I^h 12^m.

The highest high water recorded was 19·3 feet above the zero of the gauge, and occurred in October, 1888.

The lowest low water recorded was 0·1 foot above the zero of the gauge, and occurred in February, 1887.

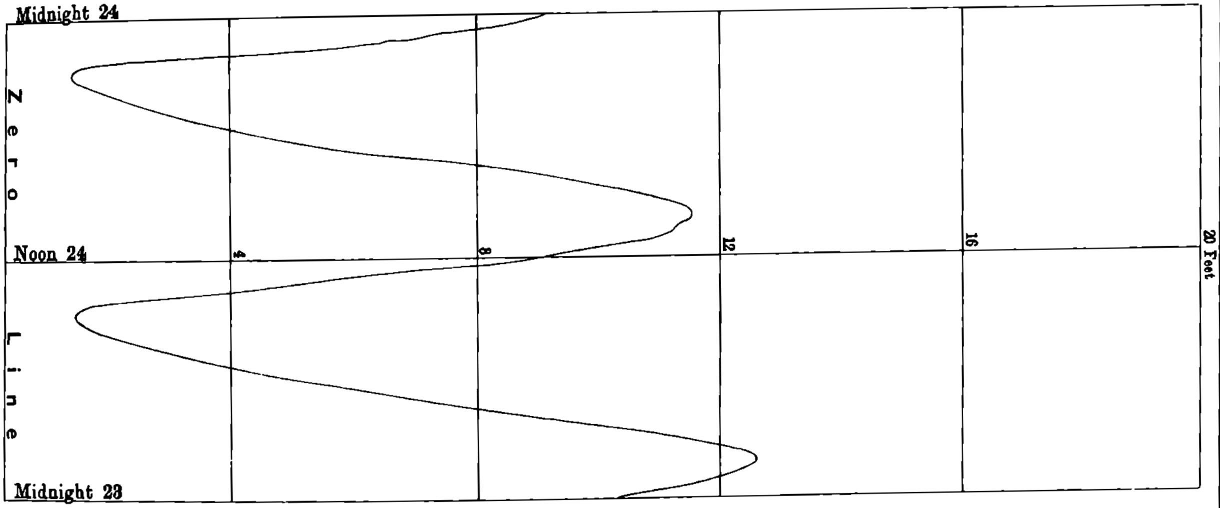
In 1889 the mean range of largest ordinary springs was found to be 13·3 feet.

The height of mean-water-level above the zero of the gauge had the following values:—

1886-87	...	...	...	8·251 feet.
1887-88	...	...	...	7·945 „
1888-89	...	...	...	7·923 „
1889-90	...	...	...	8·086 „
1890-91	...	...	...	7·977 „

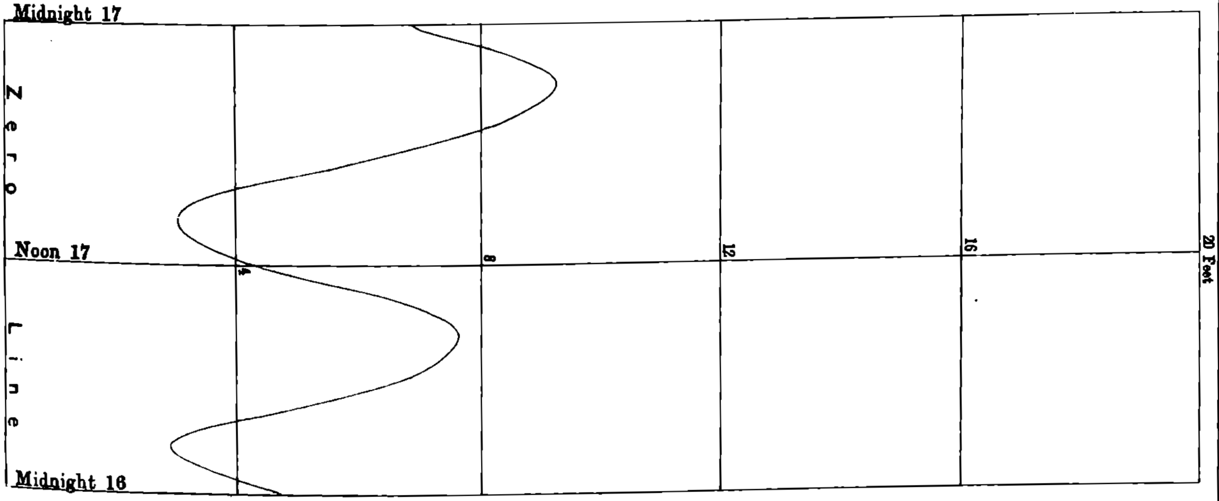
TIDAL CURVES
at
CHITTAGONG

Spring Tide — 24th February 1891



Full Moon — 23rd February 1891

Neap Tide — 17th February 1891



First Quarter — 15th February 1891

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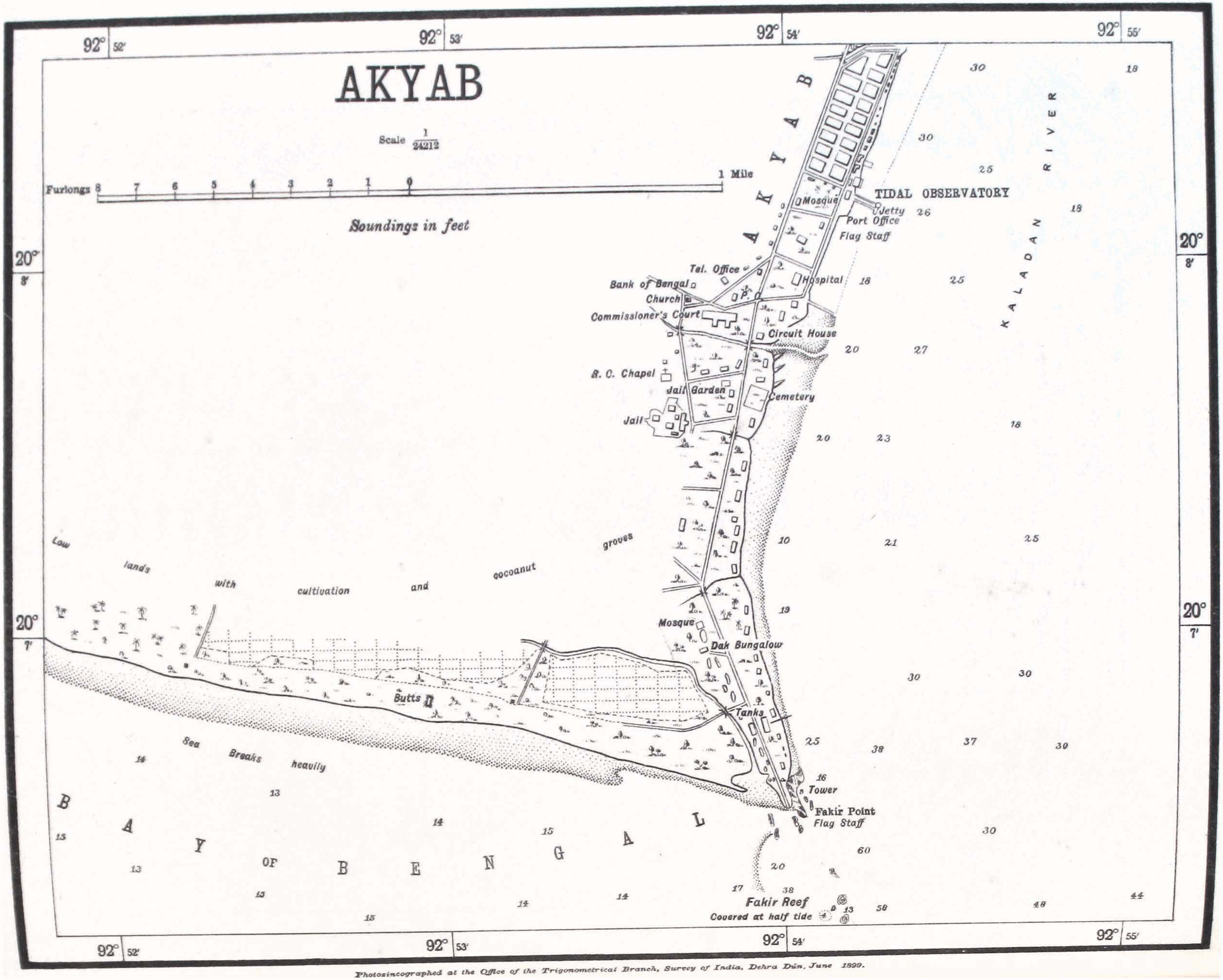
Regr. No. D. 261, S. I. D. - Sep. 99 — 500

Values of H's *at Chittagong.*

Tide	H					Tide
	1886-87	1887-88	1888-89	1889-90	1890-91	
	Feet	Feet	Feet	Feet	Feet	
S_1	0·060	0·056	0·072	0·077	0·067	S_1
S_2	1·568	1·553	1·584	1·584	1·571	S_2
S_4	0·049	0·053	0·056	0·061	0·054	S_4
S_6	·010	·010	·006	·007	·010	S_6
S_8	·002	·002	·004	·004	·004	S_8
M_1	·025	·022	·048	·043	·006	M_1
M_2	4·428	4·440	4·424	4·485	4·445	M_2
M_3	0·039	0·044	0·040	0·031	0·012	M_3
M_4	·421	·395	·403	·391	·418	M_4
M_6	·143	·149	·124	·140	·143	M_6
M_8	·035	·034	·029	·027	·029	M_8
O	·295	·289	·287	·289	·293	O
K_1	·582	·576	·599	·596	·613	K_1
K_2	·438	·397	·389	·471	·458	K_2
P	·192	·195	·188	·185	·219	P
J	·053	·027	·018	·038	·059	J
Q	·016	·025	·021	·019	·034	Q
L	·425	·399	·345	·181	·342	L
N	·869	·841	·847	·823	·824	N
λ	·207	...	...	...	...	λ
ν	·402	·295	·117	·314	·368	ν
μ	·268	·276	·304	·301	·300	μ
R	...	...	...	...	...	R
T	...	·139	·133	·074	·106	T
MS	·355	·344	·348	·345	·338	MS
2SM	·129	·138	·133	·123	·133	2SM
2N	·031	·080	·211	·334	·112	2N
M_2N	·143	·088	·167	·056	·167	M_2N
M_2K_1	·131	·102	·039	·094	·134	M_2K_1
$2M_2K_1$	·049	·043	·061	·071	·073	$2M_2K_1$
Mm	·075	·177	·230	·226	·253	Mm
Mf	·181	·173	·136	·029	·184	Mf
MSf	·432	·459	·450	·354	·443	MSf
Sa	1·666	1·435	1·637	1·221	1·877	Sa
Ssa	0·178	0·105	0·206	0·120	0·158	Ssa

Values of κ's at Chittagong.

Tide	κ 1886-87	1887-88	1888-89	1889-90	1890-91	Tide
	°	°	°	°	°	
S_1	120·09	126·75	116·28	105·21	106·70	S_1
S_2	68·45	68·18	68·46	70·86	69·88	S_2
S_4	54·55	62·52	57·51	64·95	66·66	S_4
S_6	131·08	125·19	135·00	159·25	150·83	S_6
S_8	217·41	146·98	154·89	146·31	215·91	S_8
M_1	22·82	46·83	85·37	106·76	110·16	M_1
M_2	34·89	35·29	35·12	34·61	36·49	M_2
M_3	218·15	198·34	205·35	176·88	161·03	M_3
M_4	341·96	343·52	341·10	341·89	346·29	M_4
M_6	195·45	187·69	190·55	182·79	196·04	M_6
M_8	127·12	111·64	122·48	120·31	136·80	M_8
O	11·55	16·13	10·79	9·00	11·72	O
K_1	22·19	20·30	21·87	22·95	21·14	K_1
K_2	70·88	65·93	68·30	65·69	65·57	K_2
P	26·00	31·21	31·32	34·19	32·52	P
J	51·47	98·88	17·75	33·91	59·94	J
Q	327·77	358·65	55·02	355·91	359·00	Q
L	60·30	39·17	39·71	65·96	70·35	L
N	23·51	24·78	24·48	28·77	22·81	N
λ	60·63	...	...	...	...	λ
ν	24·23	1·67	19·39	50·28	38·03	ν
μ	200·14	205·60	196·43	203·80	197·41	μ
R	...	...	...	...	...	R
T	...	246·33	164·75	83·50	302·21	T
MS	17·66	23·85	22·35	26·71	23·40	MS
2SM	299·41	303·05	306·54	295·83	296·42	2SM
2N	18·86	294·49	340·41	30·90	54·06	2N
M_2N	246·35	274·99	237·45	203·82	257·10	M_2N
M_2K_1	310·32	337·51	326·90	289·07	308·63	M_2K_1
$2M_2K_1$	262·97	262·93	279·85	266·22	273·24	$2M_2K_1$
Mm	338·70	8·64	11·13	0·18	341·66	Mm
Mf	39·64	343·44	22·07	21·36	19·53	Mf
MSf	39·14	42·31	39·61	38·90	38·82	MSf
Sa	136·59	131·74	132·62	135·87	134·51	Sa
Ssa	217·27	72·85	277·41	141·47	264·76	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, June 1899.

AKYAB.

(*Tidal Observatory, Lat. 20° 8′ N., Long. 92° 54′ E.*)

The tidal observatory of Akyab, on the Burman coast at the mouth of the Kaladan River, was one of the minor observatories at which five years' observations are considered sufficient, and was situated at the north-west corner of the T-head of the iron pier opposite the Port Office, in the position shown on the accompanying chart. It was a very well constructed, substantial wooden cabin, twelve feet square, having its corner-posts let through the floor of the pier and bolted to the girders. The float-cylinder was of wrought iron, twenty-four inches in internal diameter and twenty-eight feet long. It was supported on stout cross beams resting on the iron frame-work of the pier, and its lower end was chained to the piles of the pier. The top of the cylinder was about a foot above the floor of the observatory and about ten feet above the highest tides, and the bottom was about seven feet below the lowest tides, and had deep water beneath it. The communication was through numerous perforations in a block of iron-wood that closed the bottom of the cylinder.

The working scale of the tide-gauge was one-third.

Registrations were commenced on the 9th May, 1887, and continued most satisfactorily until the observatory was closed on the 23rd May, 1892, at the end of five years' observations. At long intervals there were brief stoppages of the driving clock caused by steamers bumping against the pier, but these in no degree affected the value of the record; and the agreement between the predicted and the actually observed times and heights of the tides at this station has been extremely close.

Barometrical and anemometrical observations were taken simultaneously with the tidal observations. The barometer was placed in the observatory and the anemometer on the top of the same building.

The bench-mark of reference is engraved G. T. S. □ B. B. M. 1887. and embedded in a block of masonry four-foot cube in the portico of the Port Office. It is 19·923 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = IX^{h} 37^{m}.

The highest high water recorded was 13·9 feet above the zero of the gauge, and occurred in October, 1888.

The lowest low water recorded was 1·5 feet above the zero of the gauge, and occurred in March, 1892.

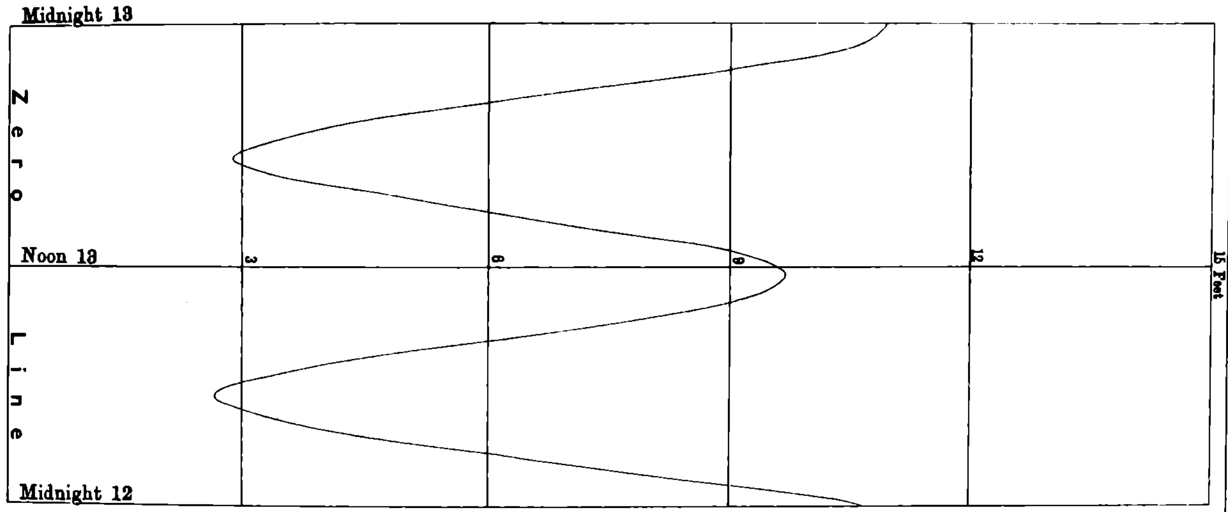
In 1890 the mean range of largest ordinary springs was found to be 8·3 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1887-88	...	...	...	7·486 feet.
1888-89	...	...	...	7·430 ,,
1889-90	...	...	...	7·684 ,,
1890-91	...	...	...	7·535 ,,
1891-92	...	...	...	7·452 ,,

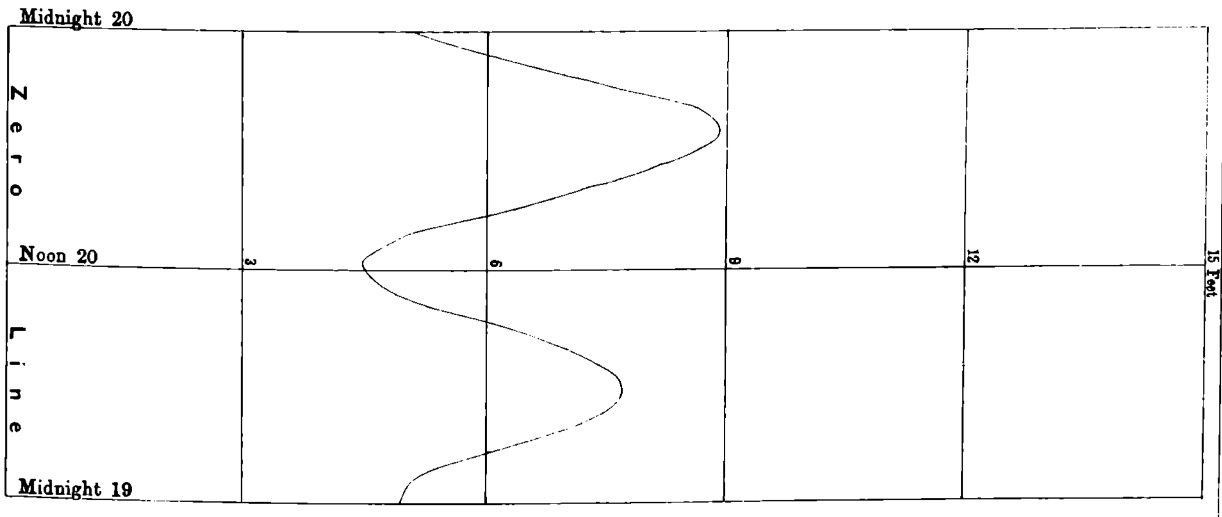
TIDAL CURVES
at
AKYAB

Spring Tide —— 13th January 1891



New Moon —— 10th January 1891

Neap Tide —— 20th January 1891



First Quarter —— 17th January 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun. August 1899.

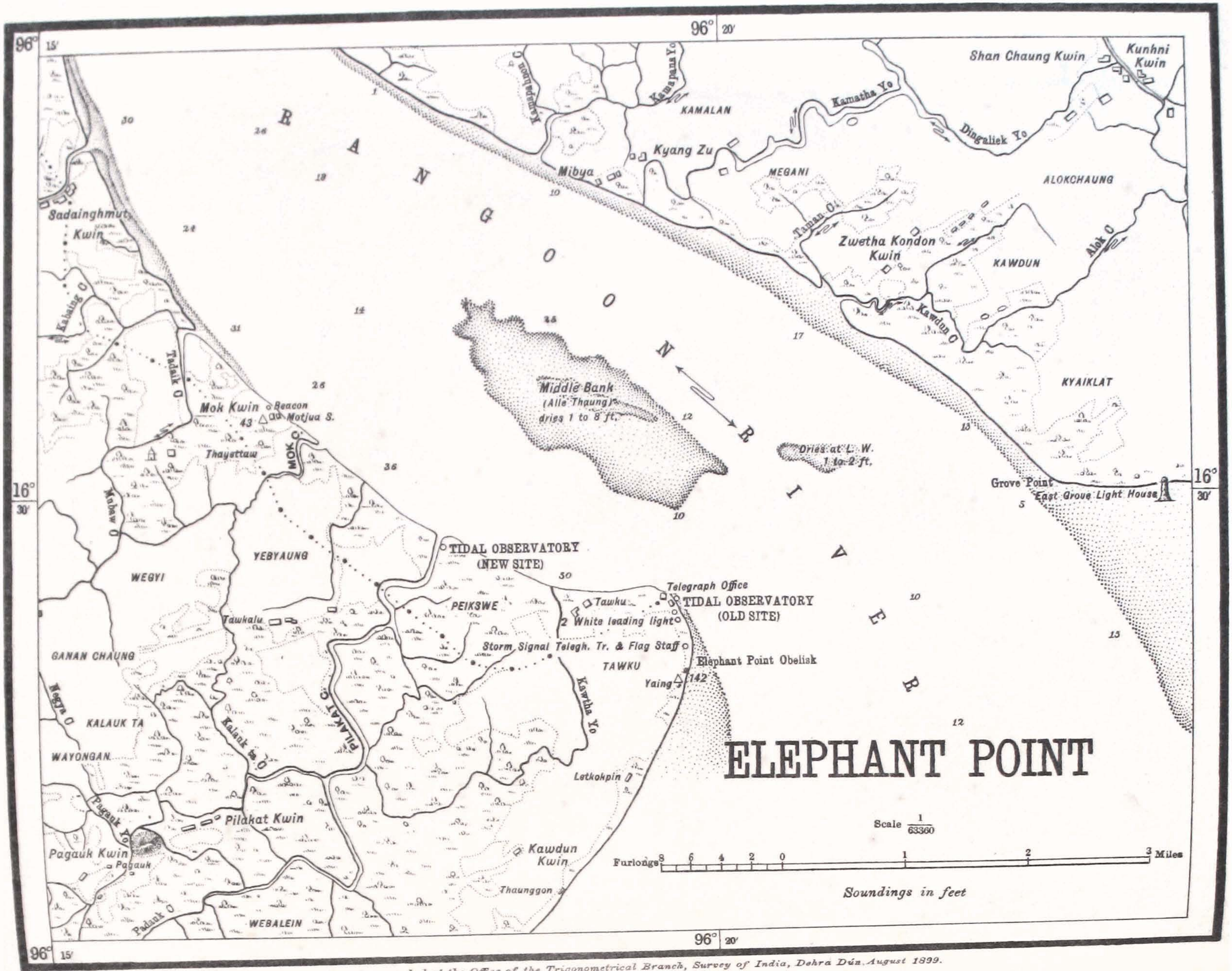
Reg. No. D. 166 S. I. D. - July 99 - 500

Values of H's *at Akyab.*

Tide	H					Tide
	1887-88	1888-89	1889-90	1890-91	1891-92	
	Feet	Feet	Feet	Feet	Feet	
S_1	0·042	0·042	0·048	0·049	0·050	S_1
S_2	1·118	1·126	1·126	1·146	1·142	S_2
S_4	0·006	0·007	0·011	0·007	0·005	S_4
S_6	·003	·002	·002	·003	·003	S_6
S_8	·003	·001	·002	·001	·002	S_8
M_1	·016	·027	·023	·003	·003	M_1
M_2	2·540	2·553	2·559	2·561	2·561	M_2
M_3	0·020	0·015	0·015	0·020	0·013	M_3
M_4	·006	·005	·004	·006	·015	M_4
M_6	·023	·023	·021	·023	·025	M_6
M_8	·006	·006	·006	·008	·010	M_8
O	·183	·183	·186	·182	·182	O
K_1	·443	·450	·442	·447	·448	K_1
K_2	·317	·316	·335	·328	·308	K_2
P	·141	·142	·130	·137	·136	P
J	·021	·026	·038	·029	·009	J
Q	·002	·007	·011	·017	·012	Q
L	·103	·114	·077	·121	·119	L
N	·520	·506	·524	·533	·508	N
λ	...	...	...	...	...	λ
ν	·053	·070	·171	·197	·120	ν
μ	·017	·027	·028	·024	·019	μ
R	...	...	...	...	...	R
T	...	·020	·088	·109	·062	T
MS	·012	·015	·008	·019	·015	MS
2SM	·041	·030	·030	·031	·036	2SM
2N	·052	·078	·105	·091	·052	2N
M_2N	·102	·095	·051	·041	·113	M_2N
M_2K_1	·016	·032	·044	·031	·013	M_2K_1
$2M_2K_1$	·012	·010	·017	·011	·019	$2M_2K_1$
Mm	·026	·070	·027	·022	·081	Mm
Mf	·081	·079	·029	·090	·041	Mf
MSf	·046	·027	·036	·060	·063	MSf
Sa	·950	·980	·768	1·138	·883	Sa
Ssa	·252	·184	·234	0·112	·187	Ssa

Values of κ's at Akyab.

Tide	κ 1887-88	1888-89	1889-90	1890-91	1891-92	Tide
	°	°	°	°	°	
S_1	84·17	91·23	71·79	75·32	74·69	S_1
S_2	310·28	308·79	307·03	307·38	306·90	S_2
S_4	208·77	210·43	201·00	179·13	178·78	S_4
S_6	107·10	55·31	123·69	53·97	103·50	S_6
S_8	113·43	108·44	46·85	85·60	59·93	S_8
M_1	342·06	22·87	18·16	324·04	297·20	M_1
M_2	280·12	277·58	277·58	277·86	277·33	M_2
M_3	11·31	13·44	27·67	21·52	39·46	M_3
M_4	289·81	282·87	228·46	274·66	295·04	M_4
M_6	132·41	114·72	116·11	123·84	126·87	M_6
M_8	142·66	130·36	162·09	156·20	146·08	M_8
O	338·44	336·60	335·71	334·69	334·52	O
K_1	344·23	343·45	343·28	343·30	342·97	K_1
K_2	304·41	309·49	308·83	304·48	305·31	K_2
P	347·04	341·72	343·65	348·04	346·16	P
J	0·88	304·77	326·32	346·94	319·08	J
Q	168·98	33·94	303·24	268·24	279·28	Q
L	291·27	274·82	289·82	302·72	301·87	L
N	270·79	269·90	269·57	271·22	272·57	N
λ	...	...	...	...	...	λ
ν	202·15	322·27	301·20	257·02	227·09	ν
μ	225·42	344·10	270·30	321·95	255·51	μ
R	...	...	...	...	...	R
T	...	54·69	333·84	281·69	230·60	T
MS	313·20	252·77	260·79	237·13	307·32	MS
2SM	197·91	195·65	216·37	208·80	201·05	2SM
2N	250·28	224·80	264·53	253·72	275·85	2N
M_2N	106·20	131·58	101·15	107·70	127·42	M_2N
M_2K_1	219·94	4·73	69·75	134·39	246·30	M_2K_1
$2M_2K_1$	27·57	40·94	66·96	67·48	52·16	$2M_2K_1$
Mm	283·81	342·73	0·74	241·74	18·37	Mm
Mf	288·91	0·44	55·46	347·95	259·55	Mf
MSf	57·56	321·32	65·07	50·81	81·53	MSf
Sa	145·80	143·45	159·02	144·54	131·19	Sa
Ssa	128·72	190·58	140·94	165·70	172·43	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, August 1899.

ELEPHANT POINT.

OPEN COAST STATION (AT OLD SITE).

(*Tidal Observatory, Lat. 16° 30′ N., Long. 96° 20′ E.*)

The minor tidal observatory at the open coast station of Elephant Point in Burma was just outside the mouth of the Rangoon river and was situated in front of the Telegraph Office, that existed there in 1880, and has since then been removed, on the right bank of the river and three quarters of a mile north-west of the Elephant Point Obelisk, in the position shown on the accompanying chart. It was a wooden cabin twelve feet square supported on the bank on piles driven well into the ground. The floor was about eleven feet above the ground and about three feet above the highest tides. The float-cylinder was of iron, twenty-two inches in diameter and thirty feet long. The top projected about two feet above the floor of the observatory and was five feet above the highest tides, and the bottom, which was closed, was sunk in the ground to a depth of two and a half feet below the lowest tides. The communication was through a two-inch iron pipe, one hundred and seventy feet long, bent into the form of a siphon and provided with a special contrivance for flushing it out. The short branch rose vertically from about eighteen inches above the bottom of the cylinder to about three feet above mean-sea-level: from this point, where there was a stop-cock, the pipe sloped gently downwards and ended in deep water.

The working scale of the tide-gauge was one-sixth.

Registrations were commenced on the 24th May, 1880, and continued without interruption for about two months, after which the communication pipe was continually getting choked and damaged, and although a great deal of trouble was taken to have as few breaks as possible, there were sixty-six days' breaks in the observations up to the end of May, 1881, when, owing to the encroachment of the water, the observatory had to be dismantled. There are thus only one year's imperfect observations at this site.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the Telegraph Office and the anemometer on the roof of the observatory.

The bench-mark of reference used during the observations does not now exist, but in 1888, it was connected with the bench-mark cut on the lowest step (the fourth from the top) on the north-east side of the Elephant Point Obelisk, and subsequently inscribed $\overset{\text{G.T.S.}}{\underset{\text{B.M.}}{\oplus}}$. This bench-mark, which still exists, has been adopted as the bench-mark of reference. It is 31·246 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = III^h 30^m.

The highest high water recorded was 27·8 feet above the zero of the gauge, and occurred in September, 1880.

The lowest low water recorded was 5·3 feet above the zero of the gauge, and occurred in January, 1881.

In 1880-81 the mean range of largest ordinary springs was found to be 18·6 feet.

The height of mean-sea-level above the zero of the gauge had the following value:—

1880-81 ... ... 16·554 feet.

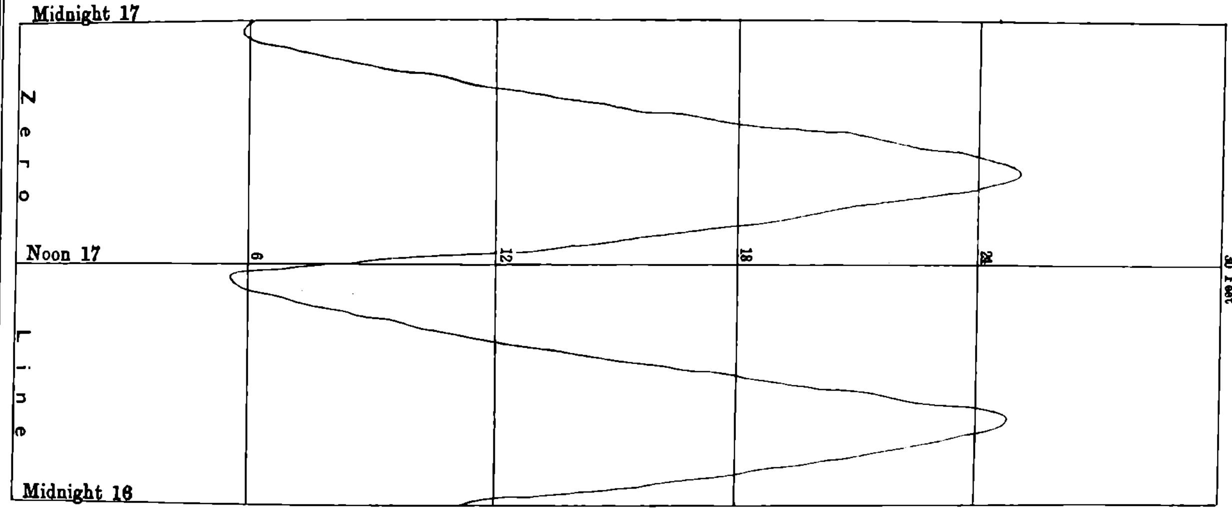
NOTE.—The zero of the gauge is 4·904 feet below the zero of the gauge at Elephant Point Riverain Station, and 7·182 feet below the zero of the gauge at Rangoon.

Values of H's *and* κ's *at Elephant Point.*

TIDE	H	κ	TIDE	H	κ
	1880-81	1880-81		1880-81	1880-81
	Feet	°		Feet	°
S_1	0·113	79·37	N	1·545	77·89
S_2	2·337	143·11	λ	0·660	323·14
S_4	0·037	162·30	ν	·682	206·42
S_6	·021	93·61	μ	·357	275·14
S_8	·008	60·07	R	...	...
M_1	·022	233·05	T	...	...
M_2	5·876	100·99	MS	·135	64·45
M_3	0·025	142·86	2SM	·042	86·57
M_4	·079	41·90	2N	·520	67·11
M_6	·206	342·71	M_2N	·687	88·95
M_8	·031	313·85	M_2K_1	·126	21·43
O	·356	277·14	$2M_2K_1$	·058	3·04
K_1	·817	99·13	Mm	·145	5·85
K_2	·405	73·24	Mf	·102	286·61
P	·199	302·52	MSf	·059	275·34
J	·113	137·78	Sa	·930	145·63
Q	·043	256·34	Ssa	·261	198·43
L	·413	278·75			

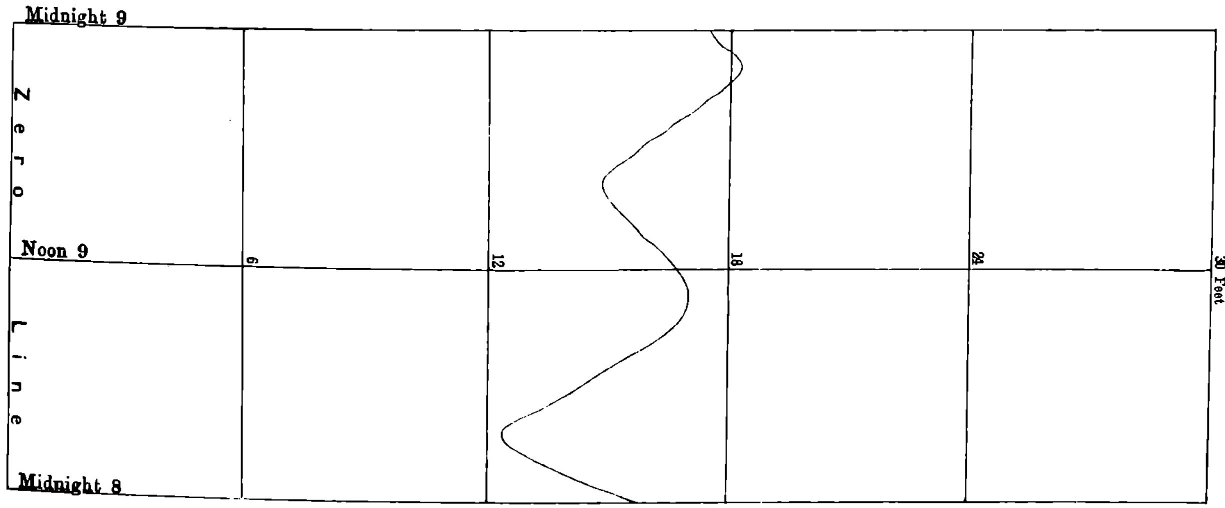
TIDAL CURVES
at
ELEPHANT POINT (Open Coast Station)

Spring Tide — 17th March 1881



Full Moon — 15th March 1881

Neap Tide — 9th March 1881



First Quarter — 7th March 1881

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dūn. September 1900.

Regy. No. D. 749, S. I. D. - June 1900 - 800

ELEPHANT POINT.

On the Rangoon River.

Riverain Station (at New Site).

(*Tidal Observatory, Lat. 16° 30′ N., Long. 96° 18′ E.*)

The tidal observatory at the riverain station of Elephant Point in Burma, on the right bank of the Rangoon river a couple of miles above its mouth, was one of the minor observatories at which five years' observations are considered sufficient. It was situated on the right bank of Pilakat Creek, about three hundred and forty yards from its junction with the Rangoon river, two and a quarter miles north-west of the Elephant Point Obelisk, and one and a quarter miles north-west of the Telegraph Office, in the position shown on the accompanying chart. It was a wooden cabin twelve feet square, supported on piles driven into the bed of the creek, and connected with the bank by a wooden foot-bridge. Instead of the usual float-cylinder, a wooden casing two feet square in section and about twenty-five feet long was used. The top was level with the floor of the observatory and was about eighteen inches above the highest tides, and the bottom, which was fitted with a wooden grating, was about twelve inches below the lowest tides. The communication was through the wooden grating mentioned.

The working scale of the tide-gauge was one-sixth.

Registrations were commenced on the 1st January, 1884, and were continued without interruption to the 5th November of the same year, when the piles supporting the observatory sank and caused a suspension of the observations until the 8th of the following month, after which though there were some unimportant interruptions necessitated by the renewal of the float-casing, repairs to the cabin and piles, and accidents to the float-band and chain, the observations were practically continuous until the 18th June, 1888, when a heavy storm rendered the observatory unsafe, and it had to be dismantled. As four and a half years' observations were completed, it was not thought necessary to reconstruct the observatory merely to extend them to the end of the customary five years.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the Telegraph Office and the anemometer on the neighbouring 'Look-out' house.

The bench-mark of reference is a stone engraved G.T.S. O A. B. M., embedded in a block of masonry close to the site of the observatory on the right or eastern bank of Pilakat Creek. It is 24·000 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $III^h 32^m$.

The highest high water recorded was 23·3 feet above the zero of the gauge, and occurred in May, 1884.

The lowest low water recorded was 0·4 foot above the zero of the gauge, and occurred in February, 1888.

In 1886 the mean range of largest ordinary springs was found to be 18·9 feet.

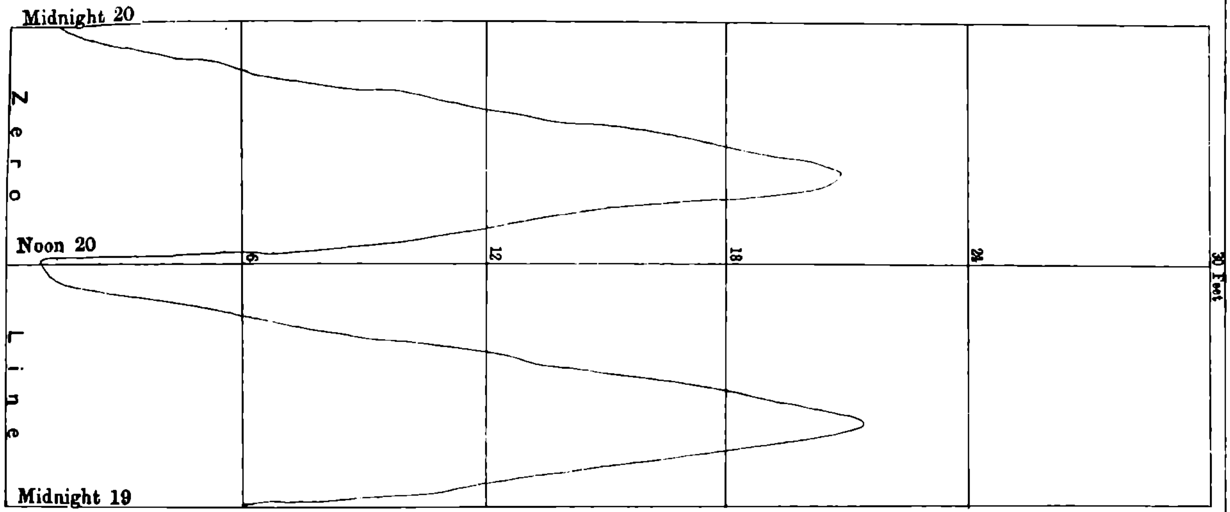
The height of mean-water-level above the zero of the gauge had the following values:—

1884	...	...	...	12·418 feet.
1885	...	...	...	11·745 „
1886	...	...	...	11·997 „
1887	...	...	...	11·982 „
1887-88	...	...	...	11·903 „

NOTE.—The zero of the gauge is 4·904 feet above the zero of the gauge at Elephant Point Open Coast Station, and is 2·278 feet below the zero of the gauge at Rangoon.

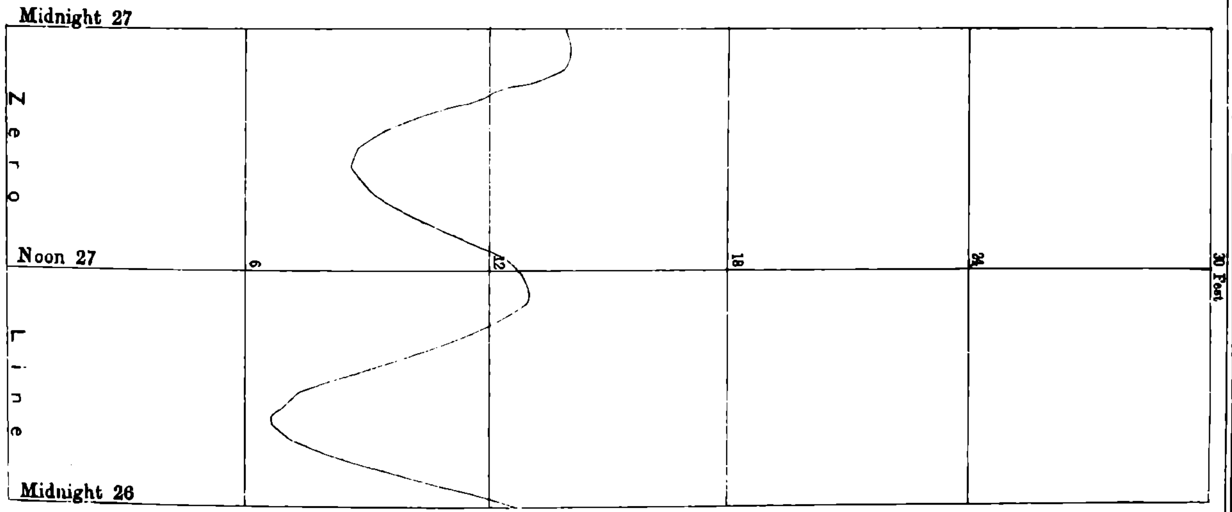
TIDAL CURVES
at
ELEPHANT POINT (On the Rangoon River)

Spring Tide —— 20th February 1886



Full Moon —— 18th February 1886

Neap Tide —— 27th February 1886



Last Quarter —— 25th February 1886

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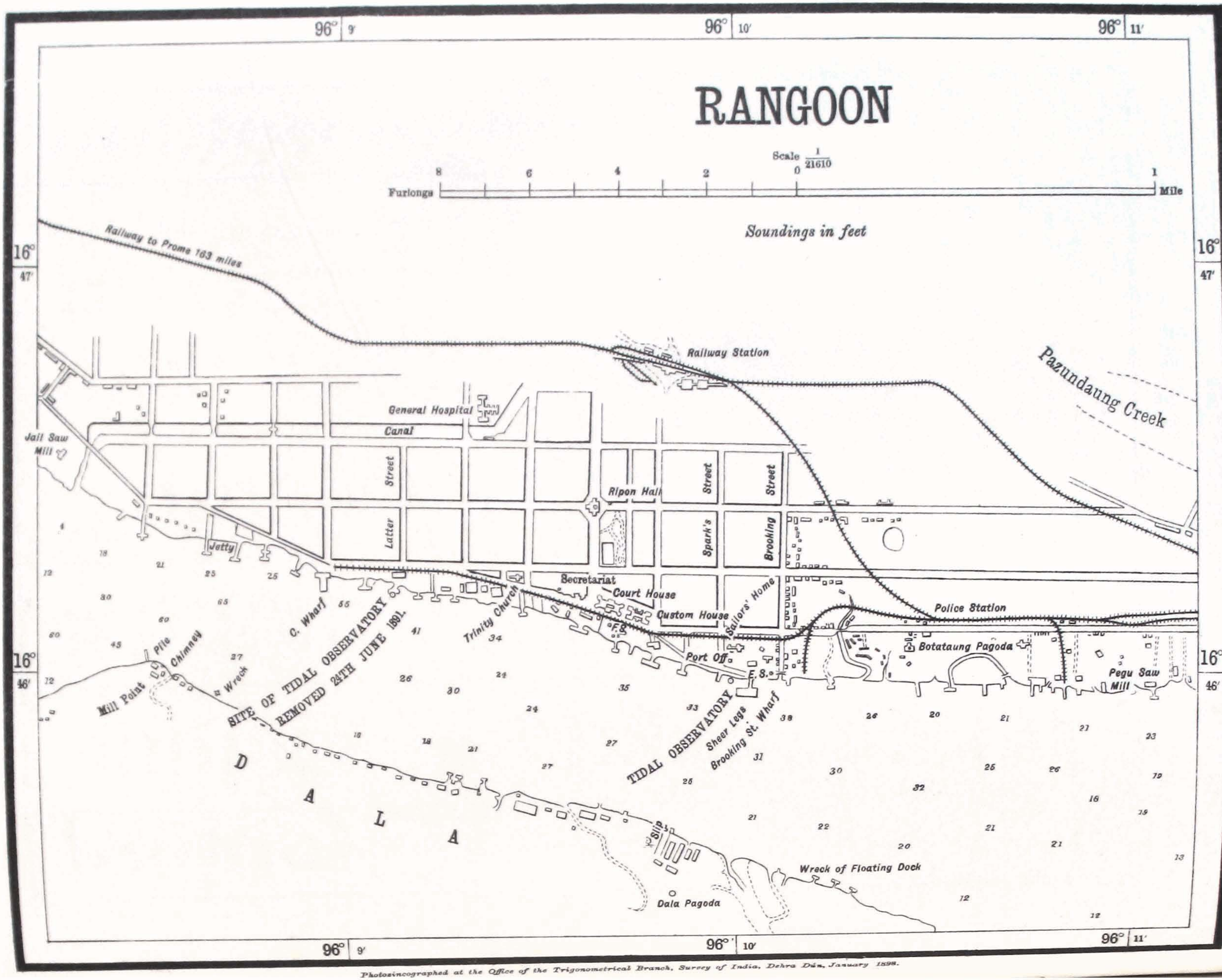
Regr. No D. 648, S. I. D. - April 1900 - 500

Values of H's *at Elephant Point.*

TIDE	H					TIDE
	1884	1885	1886	1887	1887-88	
	Feet	Feet	Feet	Feet	Feet	
S_1	0·140	0·082	0·082	0·075	0·101	S_1
S_2	2·384	2·397	2·365	2·366	2·395	S_2
S_4	0·092	0·088	0·078	0·081	0·081	S_4
S_6	·013	·007	·010	·011	·008	S_6
S_8	·009	·005	·002	·003	·001	S_8
M_1	·039	·009	·015	·039	·038	M_1
M_2	5·876	5·890	5·897	5·907	5·941	M_2
M_3	0·021	0·026	0·027	0·040	0·031	M_3
M_4	·270	·289	·275	·290	·280	M_4
M_6	·252	·241	·239	·242	·246	M_6
M_8	·107	·101	·104	·104	·104	M_8
O	·344	·323	·323	·313	·312	O
K_1	·723	·737	·751	·761	·760	K_1
K_2	·980	·716	·589	·710	·763	K_2
P	·162	·189	·195	·223	·195	P
J	·029	·064	·011	·025	·023	J
Q	·043	·024	·004	·030	·029	Q
L	·440	·250	·412	·448	·423	L
N	·961	1·052	1·145	1·207	1·188	N
λ	·188	0·178	...	...	...	λ
ν	·132	·137	0·346	0·416	0·313	ν
μ	·346	·391	·342	·329	·382	μ
R	...	·077	...	...	...	R
T	...	·318	...	·142	...	T
MS	·310	·296	·292	·277	·281	MS
2SM	·163	·112	·131	·134	·138	2SM
2N	·281	·205	·102	·105	·197	2N
M_2N	·235	·198	·126	·199	·196	M_2N
M_2K_1	·073	·055	·134	·151	·047	M_2K_1
$2M_2K_1$	·069	·076	·069	·073	·032	$2M_2K_1$
Mm	·120	·120	·075	·056	·107	Mm
Mf	·190	·120	·148	·044	·037	Mf
MSf	·226	·245	·199	·221	·170	MSf
Sa	·812	·873	·918	·764	·845	Sa
Ssa	·134	·107	·141	·150	·115	Ssa

Values of κ's at Elephant Point.

Tide	κ 1884	1885	1886	1887	1887-88	Tide
	°	°	°	°	°	
S_1	91·02	126·48	128·12	114·21	111·90	S_1
S_2	139·57	140·08	140·19	139·80	140·16	S_2
S_4	181·37	176·94	173·82	176·25	173·22	S_4
S_6	294·19	262·46	296·31	272·14	258·29	S_6
S_8	307·49	284·04	340·02	38·05	63·44	S_8
M_1	25·54	125·30	54·77	64·38	72·76	M_1
M_2	101·88	103·95	103·42	103·44	104·14	M_2
M_3	15·16	337·43	322·80	305·24	286·28	M_3
M_4	78·58	87·74	90·74	90·42	91·44	M_4
M_6	338·65	337·74	337·71	332·21	333·61	M_6
M_8	323·75	333·93	335·01	325·89	322·78	M_8
O	5·59	8·36	6·88	4·84	5·79	O
K_1	19·52	19·47	19·40	17·66	18·28	K_1
K_2	120·49	135·16	135·87	144·43	147·24	K_2
P	17·86	31·59	35·58	30·86	32·83	P
J	77·32	102·82	106·70	61·00	89·33	J
Q	23·11	328·93	279·48	4·11	38·76	Q
L	116·82	131·54	138·95	125·85	120·21	L
N	90·24	85·62	86·28	87·73	90·70	N
λ	161·97	144·48	...	...	...	λ
ν	67·51	122·10	122·77	94·95	66·62	ν
μ	273·33	293·47	288·44	302·38	302·13	μ
R	...	104·07	...	...	...	R
T	...	92·67	...	184·87	...	T
MS	121·72	127·73	125·77	129·08	130·57	MS
2SM	42·16	34·57	35·28	39·19	40·39	2SM
2N	87·44	84·96	143·73	326·54	13·74	2N
M_2N	33·75	44·75	36·31	79·77	136·10	M_2N
M_2K_1	66·26	344·26	3·22	36·12	46·99	M_2K_1
$2M_2K_1$	350·60	353·03	353·55	357·12	349·82	$2M_2K_1$
Mm	348·88	6·96	359·60	347·45	350·89	Mm
Mf	9·87	24·28	12·62	107·55	20·33	Mf
MSf	56·23	52·78	27·22	37·25	30·36	MSf
Sa	117·21	141·07	152·24	141·20	148·88	Sa
Ssa	204·09	219·26	121·94	88·91	113·58	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dūn, January 1898.

RANGOON.

ON THE RANGOON RIVER.

(*Tidal Observatory, Lat. 16° 46′ N., Long. 96° 10′ E.*)

Rangoon is the one permanent tidal station in Burma. The tidal observations there have been taken in the town of Rangoon on the left bank of the Rangoon River at two sites at which the mean-water-level has been found by Spirit-levelling to be the same. The first observatory was erected in 1880 on the Latter Street Wharf, near the centre of its length and about three feet within its edge, in the position shown on the accompanying chart. It was a wooden structure fixed to the flooring of the wharf. In place of a float-cylinder a teak-wood casing two feet square in section and twenty-nine feet long was let down through the floor of the observatory and secured by iron braces, ties, and chains. The bottom of the casing was about six feet below the lowest tides and the top about two feet above the highest. The communication was through a wooden grating fastened across the bottom of the casing. In January, 1888, the casing was replaced exactly by an iron float-cylinder twenty-four inches in diameter and twenty-nine feet long, with an iron grating across the bottom of it through which communication was effected. The site of the observatory was objectionable, owing to the great traffic, and its liability to accidents caused by the shipping. On the 14th April, 1891, the work of extending the wharf necessitated the temporary shifting of the observatory a distance of fifteen yards, and this was effected in two days. On the 24th June of the same year, the observatory was dismantled and the instruments and float-cylinder were taken to Brooking Street Wharf, about a mile further down the river, and placed in the present observatory which is far less exposed to accidents than the old one, and is conveniently situated in the river opposite the Port Engineer's Office, in the position shown on the accompanying chart. It is a substantial wooden structure supported on four iron screw piles braced together by iron tie-rods, and is connected with the bank by a wooden bridge one hundred feet long and four and a half feet wide. The iron float-cylinder from Latter Street Wharf was placed in the same position as regards high and low tides as before, and with its top on a level with the floor of the observatory, and was secured by iron tie-rods to the piles.

The working scale of the tide-gauge in its present position is one-sixth, and at Latter Street Wharf it was the same.

Registrations were commenced at Latter Street Wharf on the 1st March, 1880, and were fairly continuous until the 24th June, 1886, when a steamer coming alongside damaged the observatory and its various instruments. Registrations were resumed on the 5th of the following month, and were tolerably uninterrupted until the 28th of the following December, when the float-casing was swept away by a strong ebb-tide, and a gap ensued until the 18th January, 1887. Between the 29th June and the 1st July, 1889, a two days' gap was caused by a steamer smashing in the roof of the observatory. Throughout the period of the registrations at Latter Street Wharf, there were also frequent unimportant breaks in the tidal curves due to stoppages of the driving clock caused by vibration, and by heavy shocks received by the wharf. At Brooking Street Wharf registrations were commenced on the 4th July, 1891, and have been practically continuous and most satisfactory up to the present.

Barometrical and anemometrical observations have been carried on simultaneously with the tidal observations. The barometer has been in the observatory both at Latter Street and Brooking Street wharves. The anemometer was on the top of a galvanised iron shed at the former wharf until the 24th February, 1893, when it was transferred to the roof of the observatory at Brooking Street Wharf.

The bench-mark of reference is Graham Smith's Bench-mark, a flat stone just outside the S.E. corner of the walled enclosure of the Sailors' Home, bearing the inscription "G. S. Datum 23·27 ⊙ below this B. M." Graham Smith's Bench-mark is 23·270 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = IV^h 36^m.

The highest high water recorded was 21·3 feet above the zero of the gauge, and occurred in September, 1882.

The lowest low water recorded was 0·2 foot *below* the zero of the gauge, and occurred in February, 1893.

In 1880-81 the mean range of largest ordinary springs was found to be 16·4 feet.

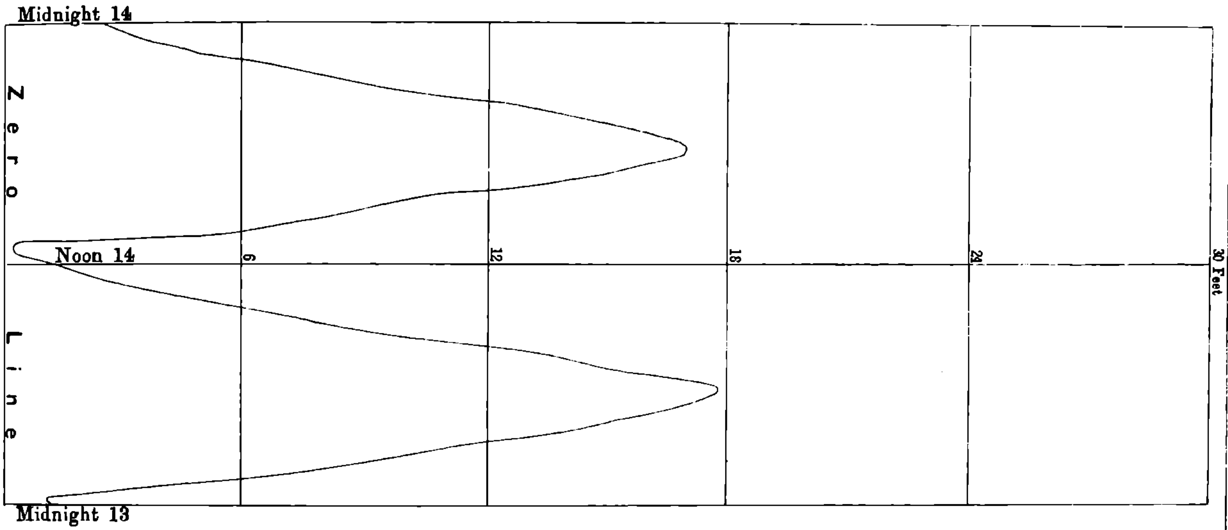
The height of mean-water-level above the zero of the gauge had the following values:—

1880-81	10·508 feet.
1881-82	10·414 „
1882-83	10·387 „
1883-84	10·359 „
1884-85	10·173 „
1885-86	10·077 „
1886-87	10·407 „
1887-88	10·194 „
1888-89	10·161 „
1889-90	10·299 „
1890-91	10·374 „
1891-92	9·991 „

NOTE.—The zero of the gauge is 2·278 feet above the zero of the gauge at Elephant Point Riverain Station, and 7·182 feet above the zero of the gauge at Elephant Point Open Coast Station.

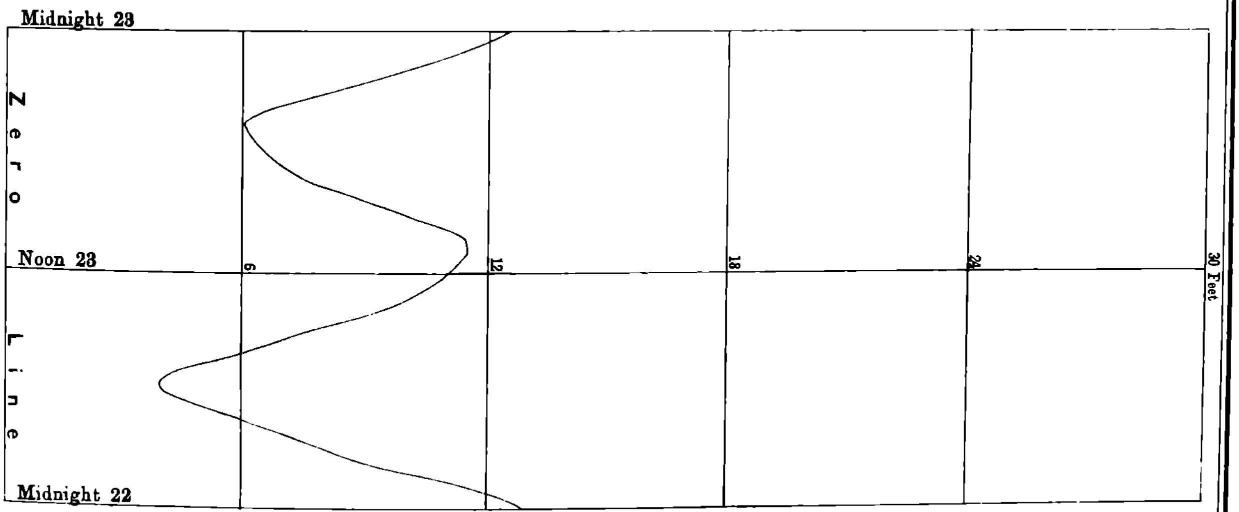
TIDAL CURVES
at
RANGOON

Spring Tide — 14th February 1892



Full Moon — 12th February 1892

Neap Tide — 23rd February 1892



Last Quarter — 21st February 1892

Photozincographed at the Office of the Trigonometrical Branch, Survey of India. Dehra Dūn, February 1900.
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Values of H's *at Rangoon.*

Tide	H 1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	Tide
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·120	0·123	0·097	0·118	0·105	0·106	S_1
S_2	2·009	2·003	2·025	1·995	2·021	1·922	S_2
S_4	0·076	0·088	0·079	0·083	0·088	0·083	S_4
S_6	·011	·009	·011	·007	·011	·011	S_6
S_8	·006	·003	·005	·002	·007	·005	S_8
M_1	·049	·037	·013	·029	·031	·017	M_1
M_2	5·539	5·519	5·577	5·588	5·635	5·609	M_2
M_3	0·009	0·016	0·038	0·024	0·031	0·030	M_3
M_4	·388	·424	·418	·441	·419	·405	M_4
M_6	·236	·227	·235	·228	·226	·228	M_6
M_8	·074	·083	·087	·094	·089	·091	M_8
O	·289	·294	·300	·297	·287	·283	O
K_1	·674	·682	·653	·666	·668	·669	K_1
K_2	·535	·576	·598	·543	·578	·699	K_2
P	·134	·148	·166	·134	·167	·139	P
J	·049	·023	·018	·034	·039	·033	J
Q	·028	·024	·028	·045	·036	·021	Q
L	·368	·327	·525	·426	·444	·283	L
N	1·045	·949	·977	1·006	1·050	1·074	N
λ	0·299	·290	·181	0·203	0·320	0·228	λ
ν	·479	·288	·184	·383	·508	·455	ν
μ	·497	·508	·536	·478	·506	·566	μ
R	...	·117	...	·096	...	·112	R
T	...	·290	...	·222	...	·289	T
MS	·349	·415	·394	·421	·386	·393	MS
2SM	·173	·155	·153	·175	·154	·187	2SM
2N	·261	·097	·079	·108	·233	·118	2N
M_2N	·123	·198	·164	·154	·096	·275	M_2N
M_2K_1	·095	·169	·193	·118	·099	·166	M_2K_1
$2M_2K_1$	·122	·117	·113	·124	·116	·121	$2M_2K_1$
Mm	·296	·230	·182	·279	·171	·206	Mm
Mf	·168	·223	·233	·228	·270	·171	Mf
MSf	·515	·559	·588	·541	·530	·542	MSf
Sa	1·600	1·415	1·444	1·405	1·201	1·184	Sa
Ssa	0·193	0·012	0·174	0·174	0·071	0·228	Ssa

Values of H's *at Rangoon*—(Continued).

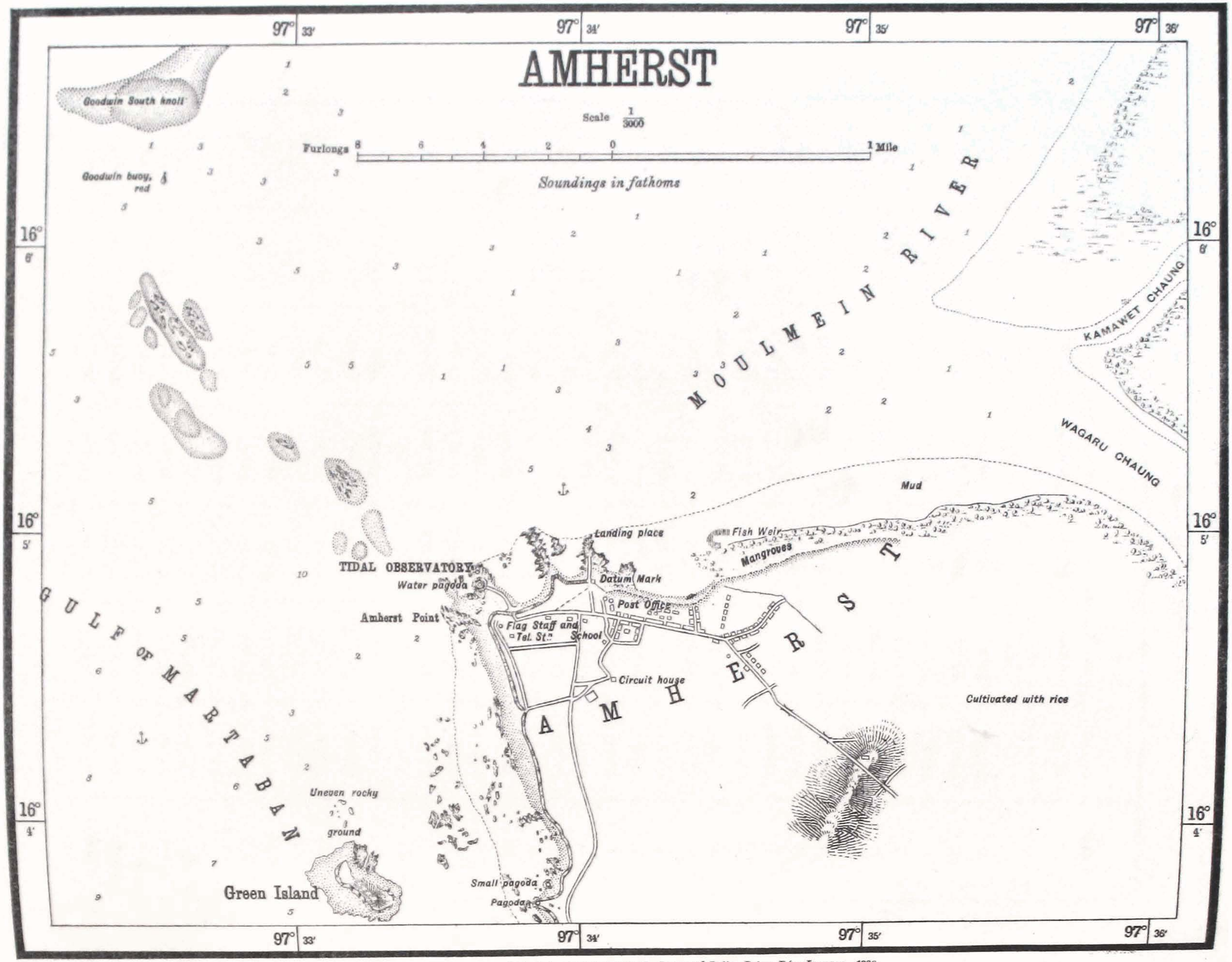
Tide	H						Tide
	1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·098	0·111	0·114	0·125	0·114	0·114	S_1
S_2	2·068	2·048	2·070	2·102	2·144	2·209	S_2
S_4	0·083	0·089	0·086	0·086	0·079	0·091	S_4
S_6	·012	·015	·008	·012	·012	·014	S_6
S_8	·005	·001	·002	·005	·003	·006	S_8
M_1	·022	·040	·035	·074	·032	·013	M_1
M_2	5·597	5·821	5·870	5·816	5·832	6·081	M_2
M_3	0·049	0·066	0·046	0·023	0·016	0·029	M_3
M_4	·441	·436	·462	·430	·455	·413	M_4
M_6	·189	·221	·196	·200	·197	·244	M_6
M_8	·081	·102	·090	·077	·076	·099	M_8
O	·298	·291	·264	·289	·283	·278	O
K_1	·655	·682	·676	·661	·674	·701	K_1
K_2	·769	·570	·630	·686	·611	·617	K_2
P	·142	·178	·161	·165	·174	·163	P
J	·023	·022	·045	·037	·014	·009	J
Q	·031	·042	·010	·017	·024	·029	Q
L	·611	·551	·517	·368	·369	·657	L
N	1·044	1·073	1·135	1·077	1·067	1·061	N
λ	...	...	...	...	...	...	λ
ν	0·236	0·297	0·510	0·461	0·256	0·220	ν
μ	·594	·483	·526	·524	·585	·537	μ
R	...	...	...	...	...	...	R
T	·135	·245	·380	·254	·136	·324	T
MS	·421	·408	·400	·407	·429	·383	MS
2SM	·192	·189	·184	·174	·192	·204	2SM
2N	·055	·059	·257	·225	·225	·091	2N
M_2N	·209	·163	·072	·244	·113	·172	M_2N
M_2K_1	·194	·130	·084	·173	·187	·099	M_2K_1
$2M_2K_1$	·110	·121	·109	·131	·125	·135	$2M_2K_1$
Mm	·176	·164	·209	·191	·214	·202	Mm
Mf	·328	·147	·192	·170	·116	·145	Mf
MSf	·489	·533	·488	·492	·526	·454	MSf
Sa	1·344	1·189	1·258	1·130	1·535	1·131	Sa
Ssa	0·099	0·120	0·206	0·159	0·370	0·141	Ssa

Values of κ's at Rangoon.

Tide	κ						Tide
	1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	
	°	°	°	°	°	°	
S_1	140·83	128·72	128·78	129·60	128·52	139·21	S_1
S_2	169·39	170·37	171·20	170·17	171·70	171·93	S_2
S_4	262·16	256·12	258·12	257·46	264·56	261·38	S_4
S_6	41·80	39·29	62·97	58·34	32·12	47·62	S_6
S_8	118·77	117·47	122·47	115·20	96·71	133·41	S_8
M_1	150·55	235·54	162·58	125·52	51·58	143·52	M_1
M_2	130·48	131·89	131·09	130·82	132·10	133·13	M_2
M_3	238·20	154·47	142·09	151·33	69·69	14·63	M_3
M_4	166·69	171·26	168·30	168·54	171·13	175·31	M_4
M_6	84·86	88·65	86·69	87·27	88·72	91·81	M_6
M_8	91·95	103·13	95·68	95·09	99·20	108·69	M_8
O	29·68	27·37	28·13	33·14	31·36	32·04	O
K_1	34·53	34·72	36·18	37·34	37·90	37·18	K_1
K_2	168·02	173·05	165·46	162·77	172·65	189·98	K_2
P	61·30	51·68	53·08	49·33	54·70	57·14	P
J	69·75	91·49	297·86	37·70	89·93	135·30	J
Q	9·29	28·75	55·57	67·76	38·76	39·94	Q
L	152·91	158·13	159·85	142·50	150·31	131·20	L
N	117·18	119·56	115·34	114·89	116·01	117·51	N
λ	174·15	183·82	151·97	142·95	168·65	197·05	λ
ν	94·18	74·94	130·39	137·99	109·09	97·55	ν
μ	288·74	294·73	285·91	288·18	287·99	292·09	μ
R	...	66·36	...	125·23	...	45·30	R
T	...	128·26	...	182·87	...	123·75	T
MS	207·15	212·18	209·99	212·97	214·23	217·50	MS
2SM	46·10	54·28	60·52	60·69	49·64	55·72	2SM
2N	89·56	147·94	63·38	82·29	74·36	125·24	2N
M_2N	35·36	343·28	56·98	36·21	31·18	11·28	M_2N
M_2K_1	48·54	68·13	86·17	102·46	63·43	66·43	M_2K_1
$2M_2K_1$	55·73	52·49	53·99	56·06	60·56	49·04	$2M_2K_1$
Mm	20·53	8·83	38·79	14·88	4·62	11·74	Mm
Mf	35·39	26·84	39·13	45·75	28·91	37·21	Mf
MSf	45·49	52·16	49·10	46·21	51·37	50·89	MSf
Sa	144·06	153·23	152·48	157·04	145·83	150·43	Sa
Ssa	305·64	314·51	3·33	0·53	263·27	298·27	Ssa

Values of κ's at Rangoon—(Continued).

Tide	κ 1886-87	1887-88	1888-89	1889-90	1890-91	1891-92	Tide
	°	°	°	°	°	°	
S_1	121·88	119·64	132·30	126·34	137·45	126·04	S_1
S_2	170·84	172·56	172·62	170·60	169·40	170·22	S_2
S_4	256·96	260·31	262·17	259·37	252·46	264·44	S_4
S_6	50·88	45·27	25·59	46·41	25·71	42·11	S_6
S_8	122·23	78·69	254·48	138·01	100·89	93·07	S_8
M_1	2·97	87·83	65·03	156·85	178·15	112·37	M_1
M_2	133·86	132·94	133·45	131·81	131·06	130·23	M_2
M_3	357·80	350·53	328·35	335·69	185·22	181·02	M_3
M_4	179·30	171·35	174·30	171·51	172·31	168·27	M_4
M_6	94·05	89·40	91·25	84·99	85·94	79·73	M_6
M_8	112·55	104·53	92·65	89·56	93·49	85·23	M_8
O	26·79	30·62	31·39	26·75	26·88	21·72	O
K_1	36·91	35·55	35·69	35·36	32·86	34·55	K_1
K_2	177·68	170·38	172·68	168·73	163·16	168·30	K_2
P	72·28	51·88	55·94	56·31	54·39	59·00	P
J	132·47	73·28	78·62	82·92	359·48	344·21	J
Q	59·13	77·63	69·38	66·41	72·56	56·13	Q
L	138·85	146·32	145·64	131·28	161·75	161·19	L
N	102·23	116·39	116·94	120·15	118·71	116·51	N
λ	...	...	...	...	...	...	λ
ν	254·30	147·48	120·70	98·24	79·59	149·01	ν
μ	286·52	292·07	291·94	292·54	291·94	285·85	μ
R	...	...	...	...	...	...	R
T	120·15	170·63	150·23	122·74	172·90	176·35	T
MS	217·21	216·72	218·24	212·55	214·15	212·65	MS
2SM	62·90	59·37	53·11	51·56	53·90	47·95	2SM
2N	115·97	129·09	48·77	93·71	125·88	184·71	2N
M_2N	80·69	50·09	15·88	26·29	38·56	69·02	M_2N
M_2K_1	90·38	106·00	59·49	64·09	87·29	108·95	M_2K_1
$2M_2K_1$	60·57	53·28	64·67	53·79	54·47	51·83	$2M_2K_1$
Mm	3·22	3·77	10·67	22·94	348·34	23·70	Mm
Mf	27·57	50·79	13·14	23·52	18·51	22·09	Mf
MSf	45·99	48·50	43·20	44·08	47·32	47·29	MSf
Sa	153·96	142·91	143·83	157·36	143·07	134·28	Sa
Ssa	348·52	24·36	323·75	42·17	335·38	267·66	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, January 1898.

AMHERST.

On the Moulmein River.

(*Tidal Observatory, Lat. 16° 5′ N., Long. 97° 34′ E.*)

The tidal observatory at Amherst, at the mouth of the Moulmein River on the coast of Burma, was one of the minor observatories at which five years' observations are generally considered sufficient, and was situated about twenty feet north of the Water Pagoda in the position shown on the accompanying chart. It was a substantial wooden cabin built on posts let into the rock, with its flooring about four feet above the highest tides. The iron float-cylinder was twenty-two inches in diameter and about twenty-six feet long. It had to be sunk in a well excavated in the rock, at first only ten feet deep; but as this depth did not embrace the lowest tides, the well was sunk lower to a depth of fifteen feet in 1881. The cylinder was held firmly by cross-beams to the bracing of the posts. The communication was by a pipe bent so as to form a syphon about ninety feet long which terminated in a rose. An air-cock protected by a box and worked by a rod was provided at the upper bend of the syphon, and a groove was cut in the rock for the reception of the pipe.

The working scale of the tide-gauge was one-sixth.

Registrations were commenced on the 30th July, 1880. The great quantity of mud held in suspension by the water necessitated frequent flushing of the communication pipe. The deepening of the well caused a cessation of the observations which lasted from the 10th April to the 18th July, 1881, and in October, 1882, a gap of twenty-four days occurred while the communication pipe was being repaired. The observatory was on three or four occasions broken into by mischievous persons who tampered with the instruments, but who fortunately never caused serious interruption to the observations, which were fairly continuous until the dismantling of the observatory in August, 1886, when an extra year's observations, taken to compensate for the break of four months in 1880-81, were completed.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was set up in the Telegraph Office, and the anemometer was placed sixteen feet above the ground on a small wooden house fifty yards south of the Telegraph Office.

The bench-mark of reference is Bench-mark A, placed on the north-eastern post supporting the Water Pagoda. It is 26·883 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $II^h\ 21^m$.

The highest high water recorded was 26·0 feet above the zero of the gauge, and occurred in August, 1882.

The lowest low water recorded was 0·8 foot above the zero of the gauge, and occurred in February, 1886.

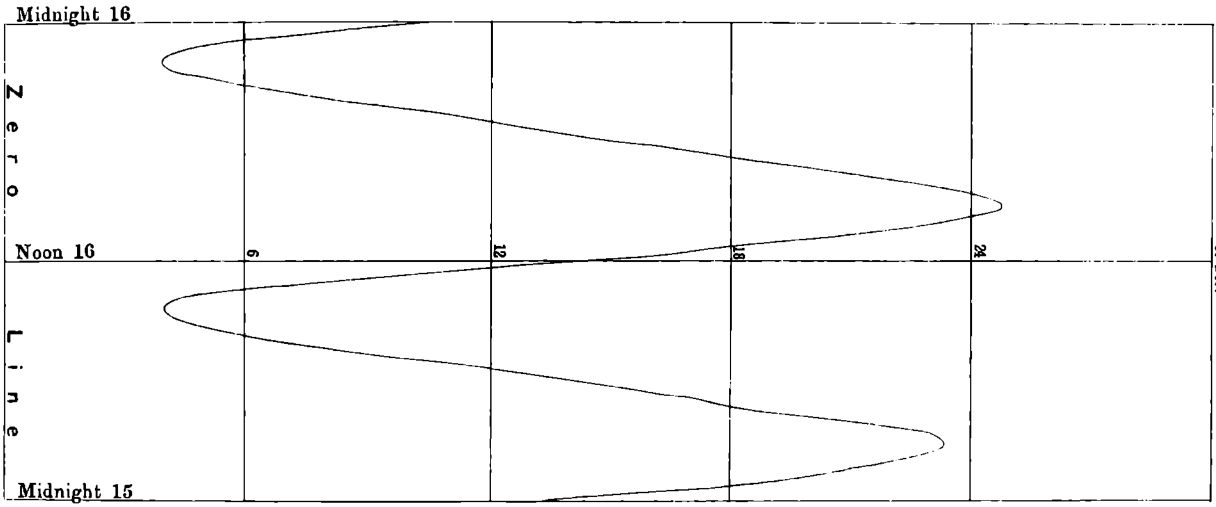
In 1881-82 the mean range of largest ordinary springs was found to be 19·2 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1880-81	13·591 feet.
1881-82	13·974 „
1882-83	13·701 „
1883-84	13·757 „
1884-85	13·588 „
1885-86	13·311 „

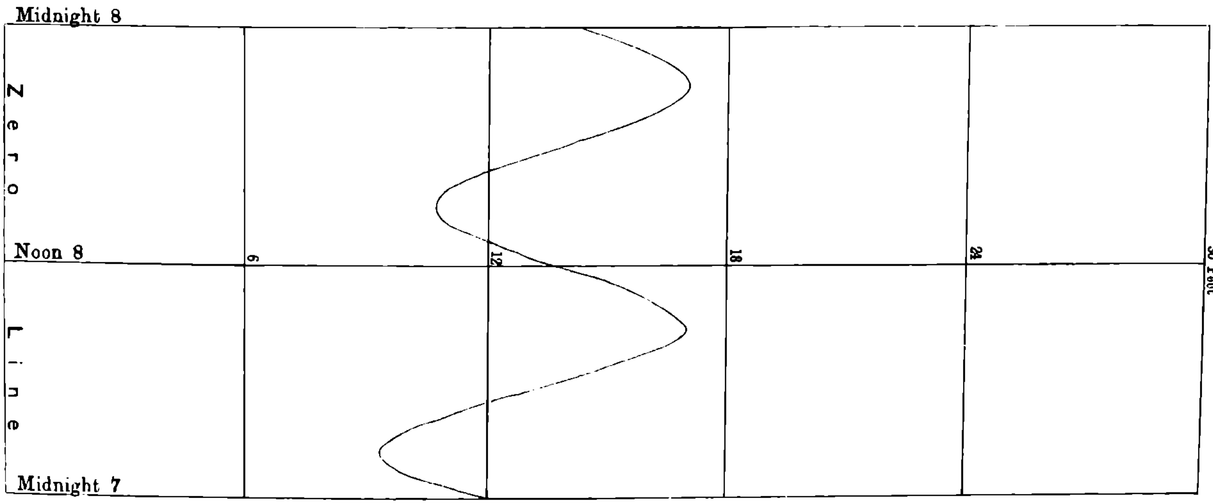
TIDAL CURVES
at
AMHERST

Spring Tide — 16th May 1885



New Moon — 14th May 1885

Neap Tide — 8th May 1885



Last Quarter — 7th May 1885

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun. February 1900.

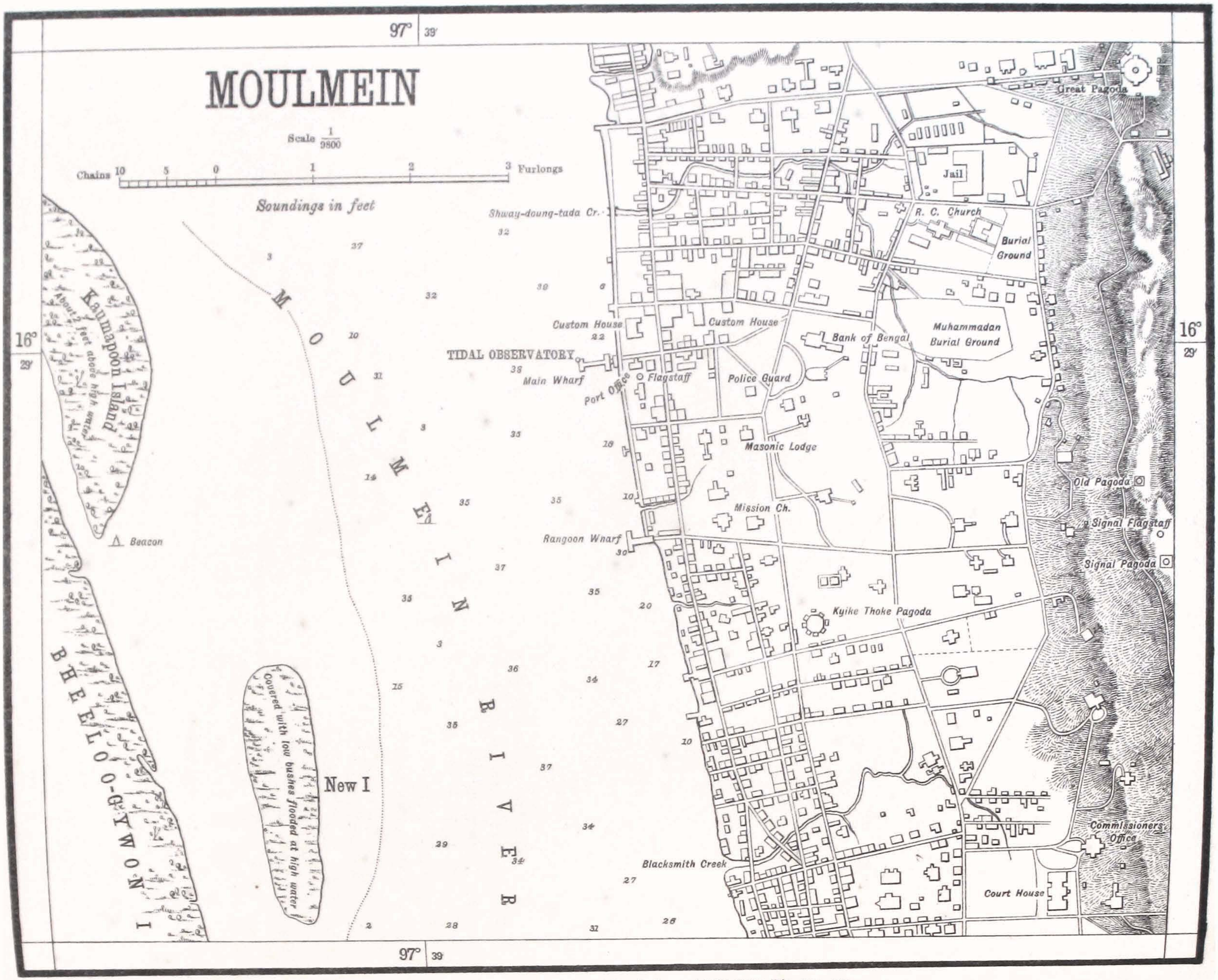
Regr. No D.291 S. I. D. - Sep. 93 500

Values of H's *at Amherst.*

Tide	H						Tide
	1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·426	0·143	0·096	0·124	0·137	0·131	S_1
S_2	2·851	2·705	2·750	2·680	2·700	2·563	S_2
S_4	0·095	0·118	0·104	0·080	0·099	0·075	S_4
S_6	·022	·004	·009	·008	·002	·002	S_6
S_8	·009	·006	·009	·003	·002	·003	S_8
M_1	·041	·021	·035	·014	·038	·045	M_1
M_2	6·230	6·081	6·389	6·376	6·427	6·415	M_2
M_3	0·034	0·003	0·019	0·021	0·033	0·031	M_3
M_4	·273	·423	·355	·303	·315	·273	M_4
M_6	·070	·146	·139	·138	·142	·151	M_6
M_8	·006	·014	·021	·016	·021	·023	M_8
O	·310	·319	·323	·339	·335	·310	O
K_1	·668	·686	·744	·714	·702	·738	K_1
K_2	1·771	·858	·682	·883	·973	·752	K_2
P	0·132	·193	·207	·207	·195	·212	P
J	·109	·083	·031	·022	·028	·045	J
Q	·064	·060	·039	·018	·020	·035	Q
L	·226	·303	·348	·362	·373	·314	L
N	1·374	1·248	1·343	1·230	1·194	1·312	N
λ	0·393	0·280	0·226	0·185	0·178	0·216	λ
ν	·426	·283	·566	·428	·232	·099	ν
μ	·443	·247	·220	·274	·202	·326	μ
R	...	·451	...	·033	...	·174	R
T	...	·841	...	·074	...	·352	T
MS	·285	·406	·350	·291	·300	·275	MS
2SM	·188	·150	·115	·176	·181	·176	2SM
2N	·325	·239	·258	·271	·204	·173	2N
M_2N	·293	·320	·164	·271	·198	·035	M_2N
M_2K_1	·105	·135	·071	·011	·102	·122	M_2K_1
$2M_2K_1$	·066	·054	·063	·039	·044	·037	$2M_2K_1$
Mm	...	·152	·038	·109	·049	·006	Mm
Mf	...	·062	·132	·083	·107	·017	Mf
MSf	...	·080	·029	·052	·067	·068	MSf
Sa	...	·638	·814	·739	·713	·886	Sa
Ssa	...	·188	·124	·161	·119	·154	Ssa

Values of κ's at Amherst.

Tide	κ 1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	Tide
	°	°	°	°	°	°	
S_1	178·00	148·53	97·13	120·19	132·64	121·86	S_1
S_2	108·69	101·22	104·70	100·39	95·11	102·09	S_2
S_4	146·81	102·23	116·81	108·12	101·27	107·59	S_4
S_6	221·61	221·06	118·99	327·53	164·48	341·57	S_6
S_8	209·25	348·16	269·33	301·83	266·99	244·36	S_8
M_1	191·71	273·03	300·37	88·34	92·93	28·99	M_1
M_2	69·94	67·60	68·46	66·06	65·09	67·26	M_2
M_3	287·00	224·23	273·03	274·63	237·32	259·81	M_3
M_4	60·32	51·34	41·49	37·02	35·73	32·03	M_4
M_6	256·69	248·25	250·72	254·39	250·34	248·96	M_6
M_8	282·25	243·79	220·09	218·83	222·19	239·89	M_8
O	327·71	338·50	351·90	344·72	347·32	349·30	O
K_1	3·47	6·29	6·27	2·90	1·12	3·88	K_1
K_2	91·39	81·38	96·78	100·63	96·40	111·49	K_2
P	307·74	348·07	353·68	2·59	5·61	12·27	P
J	13·16	6·52	82·46	10·63	58·60	72·50	J
Q	324·60	320·88	321·97	10·61	7·37	347·19	Q
L	112·34	119·89	103·28	81·05	89·84	78·07	L
N	59·61	51·10	51·00	52·12	50·50	47·65	N
λ	112·83	65·29	177·83	91·65	132·83	183·97	λ
ν	185·52	267·18	78·79	48·67	25·41	55·06	ν
μ	278·05	298·94	325·59	309·99	281·13	292·90	μ
R	...	252·46	...	346·62	...	316·23	R
T	...	143·90	...	284·28	...	78·55	T
MS	89·98	79·93	75·70	72·76	65·55	64·14	MS
2SM	345·09	28·36	15·96	5·22	13·44	327·91	2SM
2N	14·86	40·12	355·07	23·10	72·32	61·11	2N
M_2N	217·41	305·68	115·16	215·64	243·84	159·45	M_2N
M_2K_1	331·42	2·14	25·48	280·38	301·65	347·95	M_2K_1
$2M_2K_1$	293·53	325·25	329·61	309·06	319·85	313·14	$2M_2K_1$
Mm	...	43·45	51·63	341·86	3·52	290·22	Mm
Mf	...	315·34	23·66	327·64	33·68	212·82	Mf
MSf	...	76·43	65·67	134·29	69·31	306·24	MSf
Sa	...	149·83	129·63	149·27	146·54	106·54	Sa
Ssa	...	138·72	331·92	107·36	180·74	153·91	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. July 1899.

MOULMEIN.

On the Moulmein River.

(*Tidal Observatory, Lat. 16° 29′ N., Long. 97° 37′ E.*)

The tidal observatory at Moulmein in Burma was one of the minor observatories, at which five years' observations are generally considered sufficient. The town of Moulmein stands at the mouth of the river Salween on the left bank, and at the commencement of the channel known as the Moulmein River which separates the main land from a large island, named Bheelogyun, lying off it to the west. A portion of the waters of the Salween escapes to sea to the west, through a shallow channel round the north of Bheelogyun; the rest flows south, down the Moulmein River for about twenty-eight and a half miles, to Amherst, and there falls into the Gulf of Martaban. The observatory was situated on the T head of the main wharf opposite the Port Office in the position shown on the accompanying chart. It was a wooden cabin fixed on the flooring of the wharf. The floor of the observatory, on which the trestle of the tide-gauge at first rested, was about a foot and a half above the flooring of the wharf; but as the latter was found after a few months' trial to be the more rigid, the trestle was then made to rest upon it. In place of an iron float-cylinder, a stout teak-wood casing was employed; it was two feet square in section and twenty-six feet long, giving ample range for extreme tides, and was well secured to the flooring and supports of the wharf. The communication was through a number of holes in an iron plate which closed the bottom of the casing.

The working scale of the tide-gauge was one-fourth.

Registrations were commenced on the 18th April, 1880. Throughout the period of the observations there were frequent insignificant breaks in the curves due to the stoppage of the clock by vibrations caused by shocks given to the wharf. On the 7th September, 1884, the greater part of the stout teak-wood float-case was carried away, it was supposed by some heavy log coming down the stream. This caused a month's gap in the observations, but otherwise the record was practically continuous until the 24th April, 1886, when, after six years' observations, the observatory was dismantled. The configuration of the land, described above, has a remarkable effect on the tides, and in consequence of their peculiarity it was thought well to take an extra year's observations. Throughout the period of the observations, it was found that at the wharf where they were taken, the water, although rising higher at spring tides than at neaps, falls lower at neaps than at springs. Strange to say, this remarkable peculiarity of the Moulmein tides does not appear to have been noticed until these observations brought it to light.

Barometrical and anemometrical observations were carried on simultaneously with the tidal observations. The barometer was placed in the Port Office and the anemometer on the top of the same building.

The bench-mark of reference is Bench-mark A, cut on a block of Portland cement let into the flooring of the Port Office. It is 24·295 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $III^h\ 41^m$.

The highest high water recorded was 19·3 feet above the zero of the gauge, and occurred in August, 1883.

The lowest low water recorded was 1·1 feet above the zero of the gauge, and occurred in March, 1881.

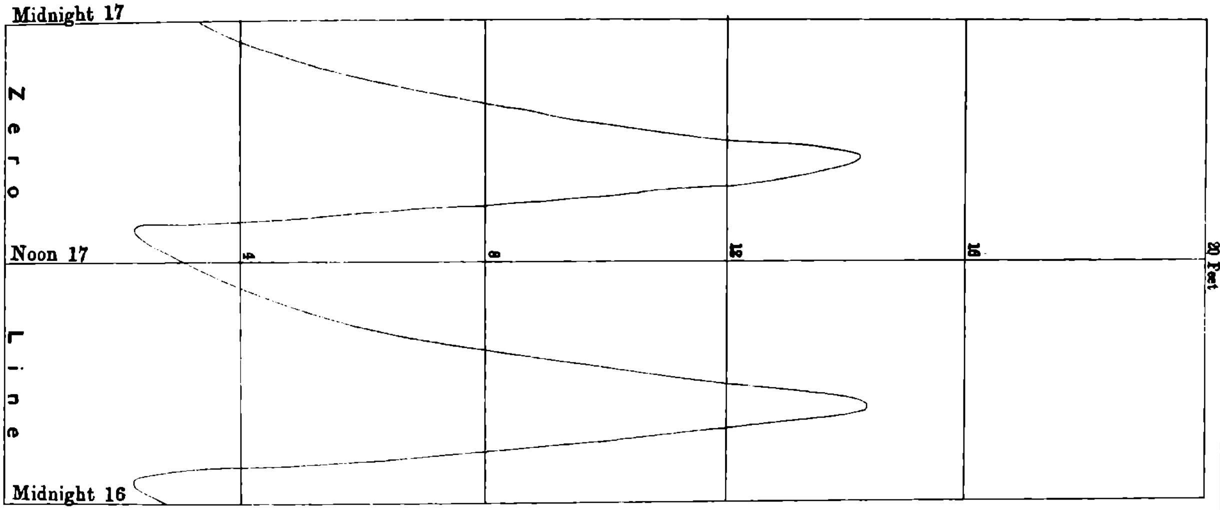
In 1880-81 the mean range of largest ordinary springs was found to be 12·7 feet.

The height of mean-water-level above the zero of the gauge had the following values:—

1880-81	8·453 feet.
1881-82	8·659 „
1882-83	8·658 „
1883-84	8·737 „
1884-85	8·146 „
1885-86	8·388 „

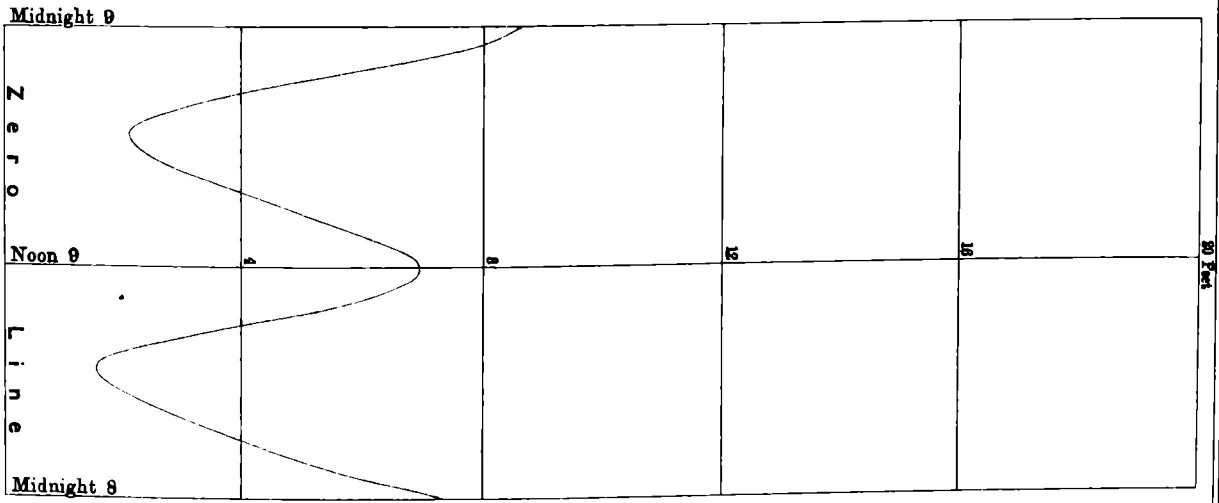
TIDAL CURVES
at
MOULMEIN

Spring Tide —— 17th February 1885



New Moon —— 16th February 1885

Neap Tide —— 9th February 1885



Last Quarter —— 6th February 1885

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, September 1899.

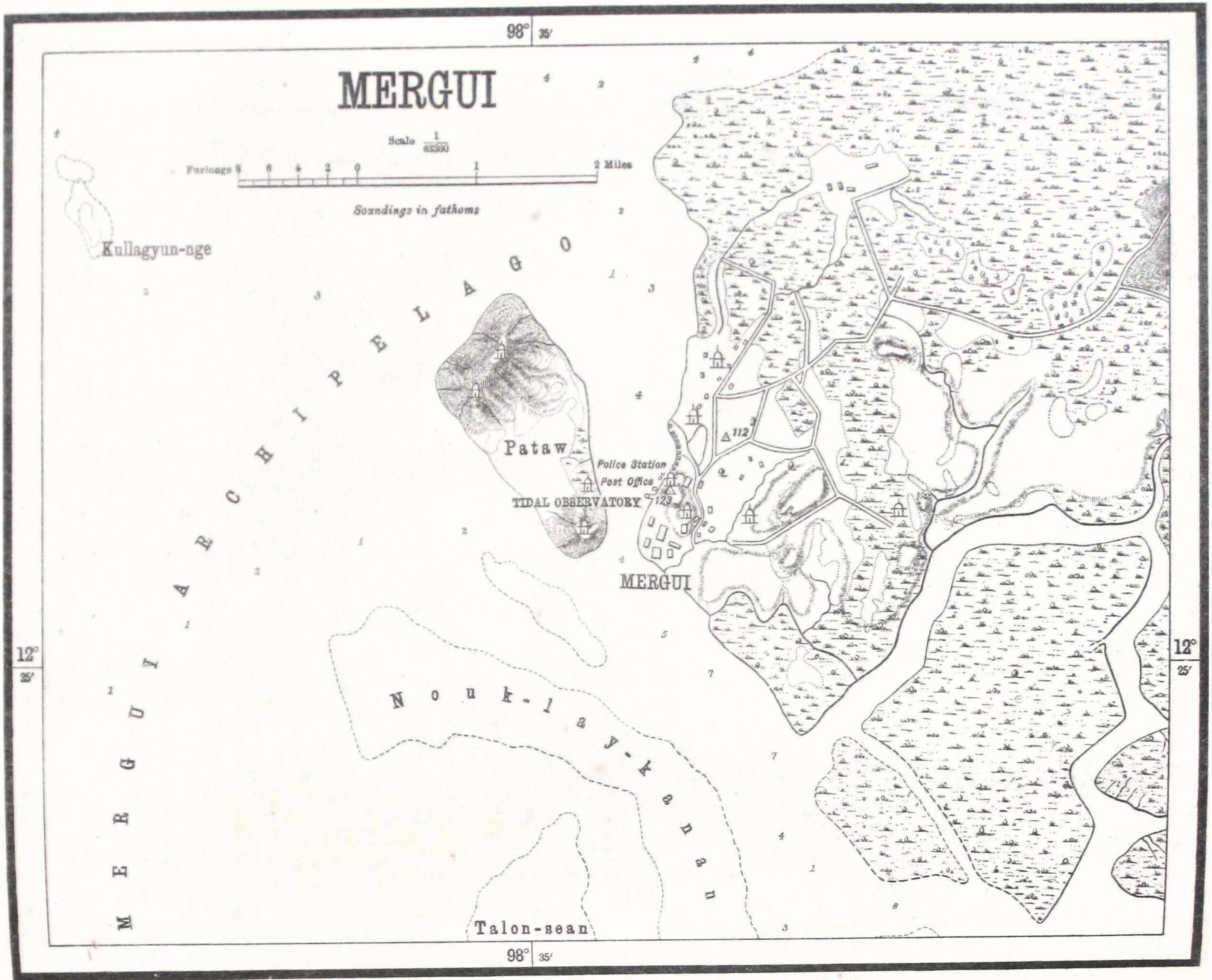
Regr. No. D. 212, S. I. D. - Aug. 99 - 500

Values of H's *at Moulmein.*

Tide	H						Tide
	1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·095	0·099	0·095	0·099	0·114	0·074	S_1
S_2	1·400	1·344	1·343	1·349	1·364	1·364	S_2
S_4	0·068	0·069	0·065	0·062	0·071	0·073	S_4
S_6	·006	·006	·004	·005	·007	·007	S_6
S_8	·002	·001	·002	·002	·002	·000	S_8
M_1	·034	·019	·002	·029	·019	·026	M_1
M_2	3·884	3·698	3·756	3·720	3·887	3·803	M_2
M_3	0·023	0·031	0·020	0·020	0·019	0·028	M_3
M_4	·926	·880	·897	·869	·906	·897	M_4
M_6	·105	·107	·095	·093	·077	·084	M_6
M_8	·034	·036	·044	·040	·043	·036	M_8
O	·256	·252	·252	·275	·273	·245	O
K_1	·452	·447	·414	·425	·456	·429	K_1
K_2	·409	·282	·316	·371	·275	·309	K_2
P	·113	·144	·144	·119	·145	·116	P
J	·038	·018	·009	·022	·016	·015	J
Q	·043	·054	·039	·042	·056	·046	Q
L	·204	·390	·242	·320	·330	·297	L
N	·735	·672	·630	·654	·620	·713	N
λ	·161	·249	·118	·104	·183	·165	λ
ν	·314	·215	·169	·173	·435	·331	ν
μ	·308	·314	·316	·347	·320	·339	μ
R	...	·097	...	·133	...	·204	R
T	...	·200	...	·151	...	·264	T
MS	·741	·701	·693	·685	·714	·715	MS
2SM	·127	·137	·109	·123	·155	·118	2SM
2N	·117	·050	·067	·120	·082	·120	2N
M_2N	·134	·100	·158	·126	·203	·086	M_2N
M_2K_1	·158	·154	·181	·197	·162	·133	M_2K_1
$2M_2K_1$	·118	·122	·108	·111	·099	·111	$2M_2K_1$
Mm	·409	·441	·229	·407	·344	·369	Mm
Mf	·282	·379	·342	·377	·217	·371	Mf
MSf	1·088	1·097	1·146	1·091	1·050	1·063	MSf
Sa	2·460	2·389	2·453	2·519	2·032	2·128	Sa
Ssa	0·563	0·653	0·593	0·653	0·501	0·730	Ssa

Values of κ's at Moulmein.

Tide	κ						Tide
	1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	
	°	°	°	°	°	°	
S_1	145·51	154·60	147·70	150·78	143·69	154·09	S_1
S_2	148·32	145·31	150·01	149·26	150·10	151·41	S_2
S_4	230·06	225·18	231·29	227·80	222·67	228·02	S_4
S_6	177·99	187·13	185·32	261·42	246·37	222·05	S_6
S_8	164·48	251·57	218·29	319·76	120·96	198·44	S_8
M_1	128·32	101·26	183·42	144·52	121·57	71·05	M_1
M_2	111·89	112·36	114·99	113·24	113·66	115·25	M_2
M_3	273·89	214·84	138·86	164·54	117·12	42·02	M_3
M_4	168·90	169·67	174·13	171·08	172·78	176·01	M_4
M_6	200·19	198·05	200·97	197·15	208·07	218·47	M_6
M_8	125·48	140·90	134·00	135·54	119·40	123·01	M_8
O	44·11	49·17	49·96	51·38	55·47	53·58	O
K_1	39·41	40·42	41·51	41·17	43·96	42·60	K_1
K_2	150·55	152·49	161·82	163·73	158·46	158·63	K_2
P	62·00	61·19	56·84	54·02	52·59	54·42	P
J	51·90	47·53	221·74	22·11	62·95	71·92	J
Q	52·63	54·80	52·88	57·16	79·36	57·33	Q
L	133·82	155·27	129·10	135·71	123·33	144·17	L
N	97·22	106·41	102·12	95·13	92·37	99·45	N
λ	152·00	182·20	162·23	106·79	153·28	170·32	λ
ν	101·46	91·35	58·12	125·65	127·76	84·25	ν
μ	272·43	258·84	279·64	274·02	260·17	279·08	μ
R	...	69·59	...	78·67	...	71·57	R
T	...	110·28	...	173·75	...	100·22	T
MS	209·92	208·62	214·47	213·33	215·44	217·96	MS
2SM	37·64	40·25	37·43	38·79	49·97	40·30	2SM
2N	110·84	75·87	30·18	79·06	144·78	73·56	2N
M_2N	33·22	327·26	41·67	30·32	35·75	4·24	M_2N
M_2K_1	95·03	77·83	79·19	92·78	103·41	87·40	M_2K_1
$2M_2K_1$	56·27	62·13	64·43	69·66	57·40	60·91	$2M_2K_1$
Mm	3·00	17·43	21·38	18·72	5·08	9·33	Mm
Mf	42·25	40·10	40·47	49·27	31·98	32·04	Mf
MSf	43·24	47·84	45·68	45·23	42·49	45·30	MSf
Sa	144·56	152·84	148·89	151·86	143·52	150·71	Sa
Ssa	282·51	283·89	295·13	298·36	267·69	287·80	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún. July 1899.

Regr. No. D. 112, S. I. D. - May 99 - 500

MERGUI.

(*Tidal Observatory, Lat. 12° 26′ N., Long. 98° 36′ E.*)

The tidal observatory at Mergui in Burma, on the coast of Tenasserim, is one of the minor observatories at which five years' observations are considered sufficient, and is situated twenty-three feet beyond the T-head of the Mergui Pier, in the position shown on the accompanying chart. It is a wooden cabin, twelve feet square, resting on four piles driven sixteen feet into the bed of the anchorage. Its flooring is about three feet above the highest tides, and four feet above the level of the head of the pier with which it is connected by a wooden bridge having a movable piece at the end to isolate it. The float-cylinder is of wrought iron, twenty-four inches in internal diameter and thirty feet long. Its top is two feet three inches above the observatory floor, and the bottom, which is closed, rests on the bed of the anchorage, and being close in to shore is only two and a half feet below the lowest tides. The cylinder is supported by cross beams under its flanges, and its lowest length is guyed to the piles by four chains. The communication is through three sets of holes bored in the lowest length of the cylinder.

The working scale of the tide-gauge is one-sixth.

Registrations were commenced on the 24th March, 1889, and have been practically continuous up to the present. At first there were several insignificant breaks in the curve from stoppages of the driving clock due to cargo boats bumping against the piles; but the construction at the end of 1891 of an outer barrier, consisting of horizontal beams connecting four stout piles, has removed this source of interruption. In 1891, the clerk allowed a time error to accumulate until it reached seventeen minutes, thus involving correction of the diagrams.

Barometrical and anemometrical observations are carried on simultaneously with the tidal observations. The barometer was set up in the observatory, and the anemometer was placed on the roof of the Court House on the top of the hill.

The bench-mark of reference is a stone engraved A G.T.S. O B.M. and embedded in a block of masonry about five feet from the S.E. corner of the Post Office. It is 26·488 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = X^h 29^m.

The highest high water recorded was 24·2 feet above the zero of the gauge, and occurred in September, 1891.

The lowest low water recorded was 1·4 feet above the zero of the gauge, and occurred in March, 1891.

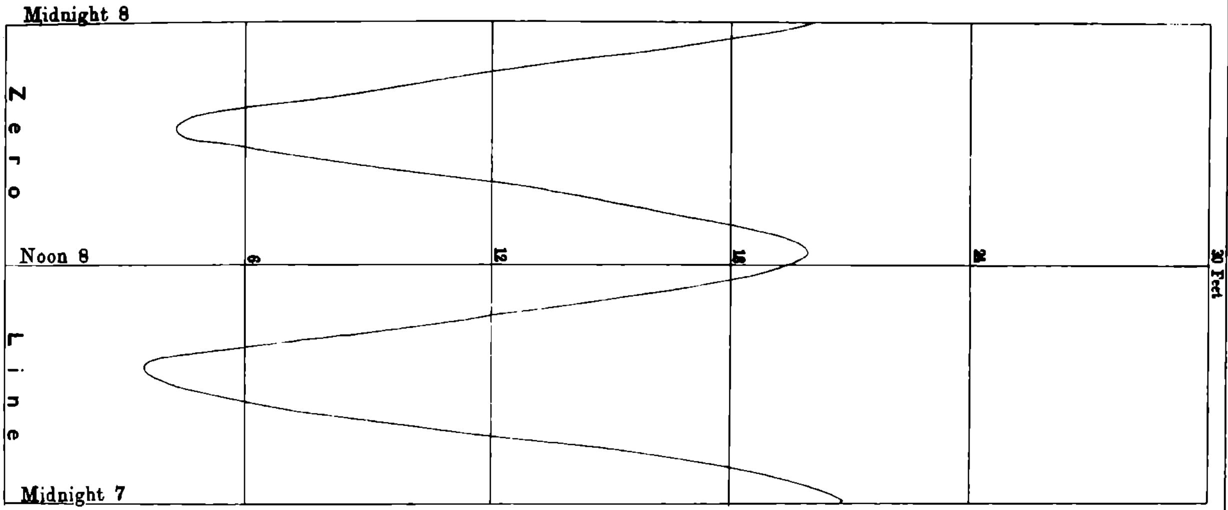
In 1890 the mean range of largest ordinary springs was found to be 18·1 feet.

The height of mean-sea-level above the zero of the gauge had the following values:—

1889-90	...	...	...	13·084 feet.
1890-91	...	...	...	12·983 „
1891-92	...	...	...	12·902 „
1892-93	...	...	...	12·999 „

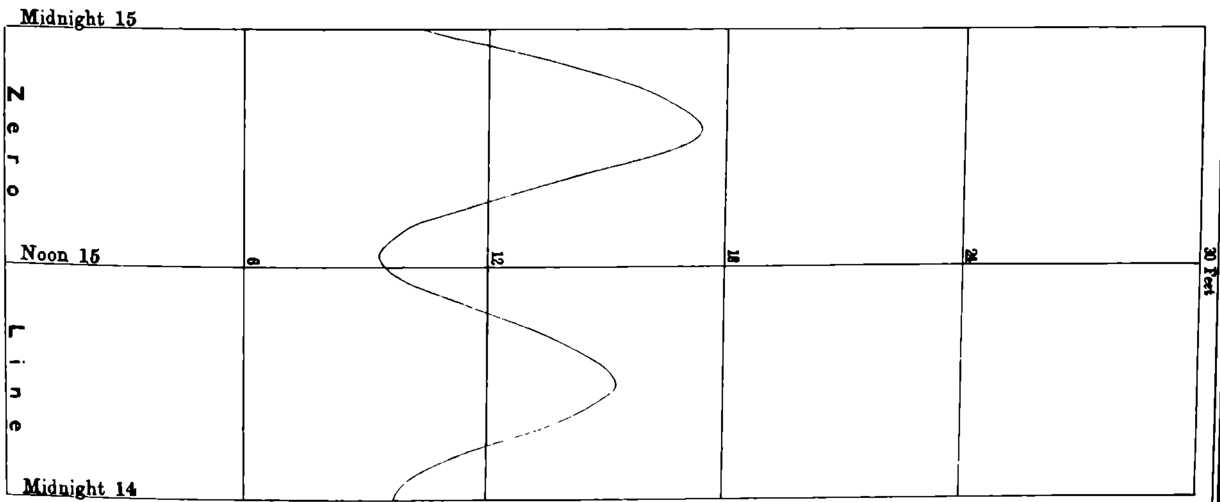
TIDAL CURVES
at
MERGUI

Spring Tide —— 8th February 1890



Full Moon —— 5th February 1890

Neap Tide —— 15th February 1890



Last Quarter —— 12th February 1890

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun. September 1899.

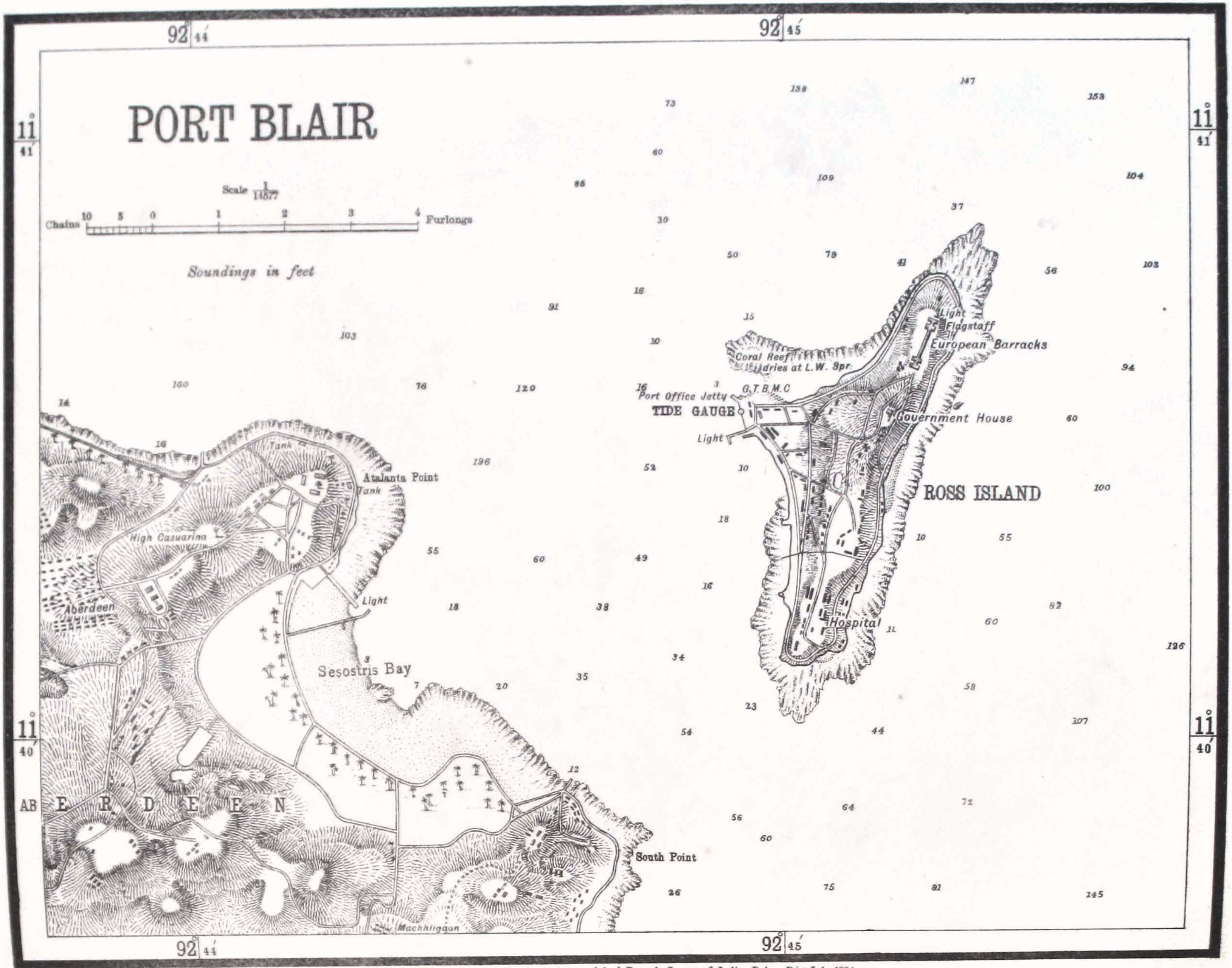
Regr No D 165, S. I. D. - July 99-500

Values of H's *at Mergui.*

Tide	H				Tide
	1889-90	1890-91	1891-92	1892-93	
	Feet	Feet	Feet	Feet	
S_1	0·083	0·073	0·065	0·076	S_1
S_2	2·903	2·912	2·946	2·921	S_2
S_4	0·042	0·046	0·050	0·043	S_4
S_6	·022	·018	·017	·015	S_6
S_8	·003	·001	·002	·004	S_8
M_1	·028	·015	·004	·011	M_1
M_2	5·506	5·486	5·505	5·495	M_2
M_3	0·040	0·051	0·064	0·064	M_3
M_4	·120	·120	·122	·125	M_4
M_6	·070	·070	·081	·067	M_6
M_8	·023	·017	·013	·016	M_8
O	·211	·208	·210	·208	O
K_1	·524	·518	·521	·530	K_1
K_2	·792	·848	·880	·854	K_2
P	·150	·160	·151	·151	P
J	·046	·024	·024	·031	J
Q	·031	·026	·025	·033	Q
L	·205	·240	·340	·210	L
N	1·068	1·068	1·019	·994	N
λ	...	...	...	...	λ
ν	0·327	0·262	0·051	·224	ν
μ	·437	·441	·425	·462	μ
R	...	...	...	...	R
T	...	·240	·163	·306	T
MS	·167	·144	·161	·155	MS
2SM	·176	·206	·157	·167	2SM
2N	·196	·162	·164	·120	2N
M_2N	·117	·226	·141	·113	M_2N
M_2K_1	·078	·069	·037	·044	M_2K_1
$2M_2K_1$	·011	·004	·006	·020	$2M_2K_1$
Mm	·034	·048	·084	·071	Mm
Mf	·043	·010	·043	·063	Mf
MSf	·055	·023	·043	·044	MSf
Sa	·492	·645	·528	·645	Sa
Ssa	·220	·108	·125	·200	Ssa

Values of κ's at Mergui.

Tide	κ 1889-90	κ 1890-91	κ 1891-92	κ 1892-93	Tide
	°	°	°	°	
S_1	73·14	72·64	69·92	60·09	S_1
S_2	349·79	350·45	347·90	349·18	S_2
S_4	226·84	243·10	236·47	222·36	S_4
S_6	108·68	94·55	92·39	123·58	S_6
S_8	236·31	114·78	148·00	226·08	S_8
M_1	20·78	131·89	15·86	337·68	M_1
M_2	309·78	311·57	308·38	310·35	M_2
M_3	132·11	137·98	134·91	131·60	M_3
M_4	128·91	136·56	132·11	131·32	M_4
M_6	217·41	232·72	236·69	234·78	M_6
M_8	59·67	67·26	45·69	58·90	M_8
O	317·67	315·18	312·72	312·78	O
K_1	333·48	334·53	334·70	333·76	K_1
K_2	344·76	347·58	343·82	341·10	K_2
P	334·94	336·74	331·81	336·82	P
J	343·83	335·68	289·96	321·18	J
Q	274·33	265·00	281·53	300·24	Q
L	300·94	278·28	306·04	247·46	L
N	306·57	311·75	307·68	306·22	N
λ	...	...	...	...	λ
ν	294·53	256·21	240·88	348·04	ν
μ	347·36	344·51	349·65	344·54	μ
R	...	...	...	...	R
T	...	313·34	16·51	5·16	T
MS	173·88	181·77	178·00	165·33	MS
2SM	138·60	130·21	124·17	129·62	2SM
2N	265·41	306·09	312·73	329·11	2N
M_2N	184·51	179·80	242·86	154·50	M_2N
M_2K_1	132·63	206·40	301·57	73·36	M_2K_1
$2M_2K_1$	336·15	104·69	227·39	157·81	$2M_2K_1$
Mm	31·50	350·51	27·49	339·50	Mm
Mf	350·69	357·34	37·27	44·91	Mf
MSf	0·72	346·94	48·99	37·66	MSf
Sa	167·56	139·00	140·92	141·34	Sa
Ssa	109·29	99·00	158·25	75·71	Ssa



Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún July 1894.

PORT BLAIR.

(*Tidal Observatory, Lat. 11° 41′ N., Long. 92° 45′ E.*)

The tidal observatory at Port Blair, in the Andaman Islands, is one of the permanent observatories, and is situated two hundred feet north of the pier, on the sea wall adjoining the Port Officer's house on the west side of Ross Island, in the position shown on the accompanying chart. The present observatory was erected in January, 1892, on the same site as had been occupied by the original observatory from 1880 till the 1st November, 1891, when it was destroyed together with all the instruments, &c., by a most violent cyclone which caused serious damage and loss of life at Port Blair. The original observatory was a substantial wooden structure resting partly on the sea wall and partly on piles. The float-cylinder was twenty-two inches in internal diameter and sixteen and a half feet long: its lower end was sunk two and a half feet into the bed of the sea, giving nearly four feet of water in the cylinder at extreme low tides; and its mouth was about three and a half feet above highest tides. The communication was at first by a two and three quarter inch pipe, sixty feet long, leading from the bottom of the cylinder into deep water; but this arrangement was found superfluous, and communication by small holes near the bottom of the cylinder was substituted for it in December, 1884. In 1889 a masonry wall was built round the cylinder so as to enclose it in a well and protect it the better, and communication with the sea was obtained by means of small zinc tubes passed through the wall.

The working scale of the tide-gauge was one-half.

Registrations commenced in April, 1880, and were practically continuous until the 10th September, 1884, when a gap occurred until the 1st November following, while the cylinder was being repaired. At long intervals the tidal curves were impaired by short breaks due to renewals of and repairs to the cylinder, and by occasional retardation caused by obstruction of the communication; but the record was practically continuous and satisfactory till the cyclone destroyed the observatory. The new observatory was erected, and observations were resumed, by the 30th January, 1892. It is very similar to the old observatory, and the tide-gauge has the same working scale, namely one-half. The float-cylinder is thirty-six inches in internal diameter and fourteen feet long: its upper flange rests on the floor of the observatory and its bottom is supported about two feet below the lowest tides on a flat circular stone thirty-eight inches in diameter. The communication is by three holes, each half an inch in diameter, nine inches above the bottom of the cylinder. The water immediately under the observatory, enclosed by the supporting piles and the sea wall, has been strongly planked in (about an inch of water way being left between the planks), thus protecting the cylinder from the roughness of the external water. The registrations have been highly satisfactory up to the present. The disturbances of the surface of the ocean, caused by an earthquake whose centre lay between Port Blair and Car Nicobar, were recorded at this station by the self-registering tide-gauge on the 31st December, 1881, and those caused by the Krakatoa volcanic eruptions were similarly recorded on the 27th August, 1883.

Barometrical and anemometrical observations have been carried on simultaneously with the tidal observations. The barometer is placed in the observatory and the anemometer on the top of the European Barracks on the ridge at the north-eastern extremity of Ross Island. They were similarly situated before the cyclone of 1891.

The bench-mark of reference is the Bench-mark A situated in the verandah of the Port Officer's house. It is 11·24 feet above the zero of the gauge.

The establishment of the Port, calculated according to the method employed by the Marine Survey of India = $IX^h\ 36^m$.

The highest high water recorded was 9·2 feet above the zero of the gauge, and occurred in December, 1892, (the record during the cyclone of the 1st November, 1891, perished with the observatory).

The lowest low water recorded was 0·4 foot above the zero of the gauge, and occurred in March, 1888.

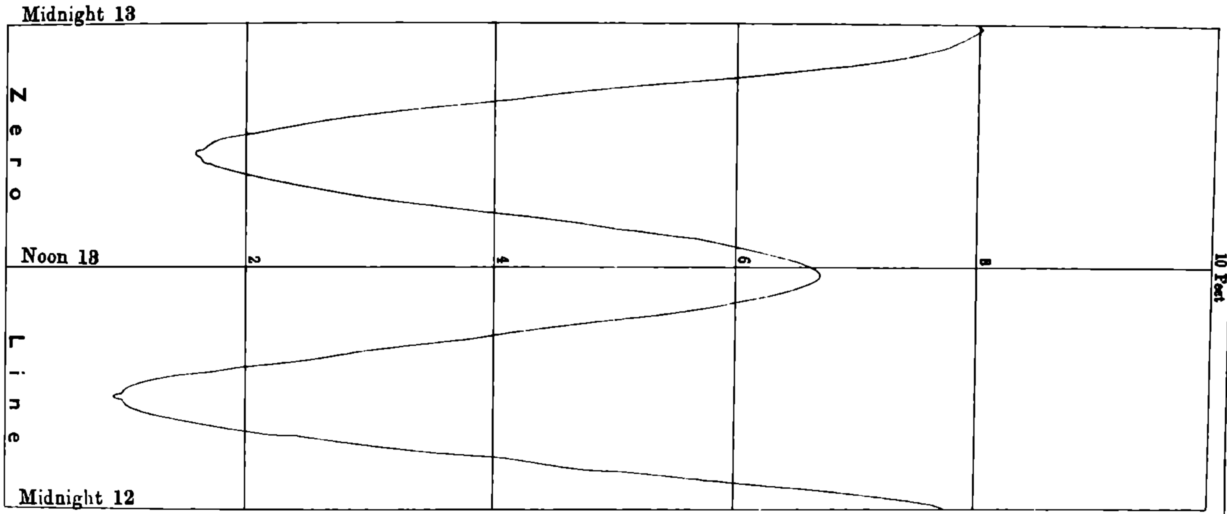
In 1880-81 the mean range of largest ordinary springs was found to be 6·6 feet.

The height of mean-sea-level above the zero of the gauge had the following values :—

1880-81	4·792 feet.
1881-82	4·718 „
1882-83	4·710 „
1883-84	4·726 „
1884-85	4·689 „
1885-86	4·612 „
1886-87	4·506 „
1887-88	4·709 „
1888-89	4·625 „
1889-90	4·586 „
{ 1890-91 (ending 24th April, 1891) ...	4·605 „
{ 1890-91 (ending 29th October, 1891)	4·606 „
1892-93	4·811 „

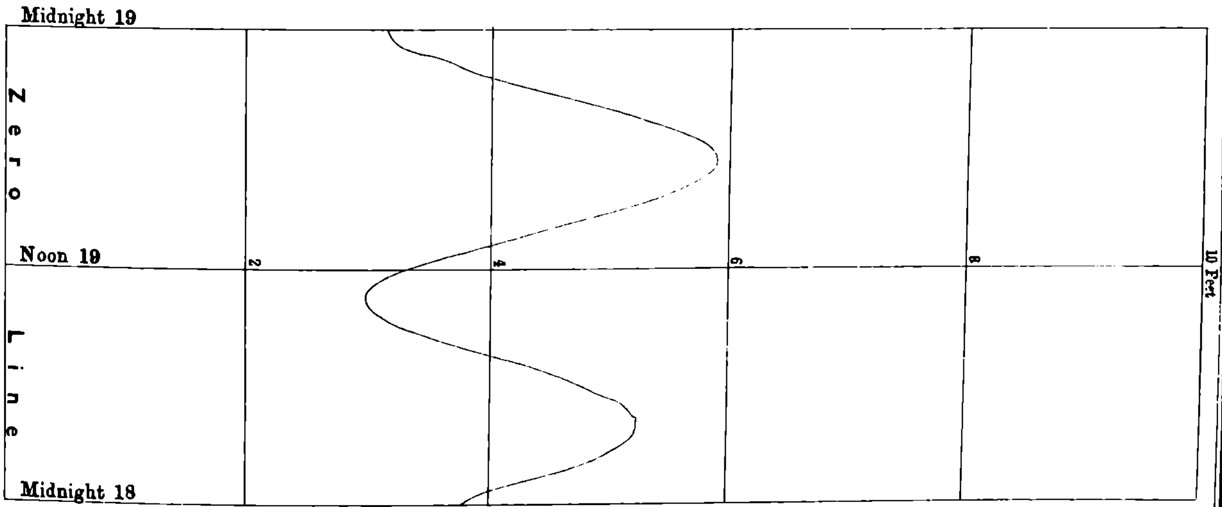
TIDAL CURVES
at
PORT BLAIR

Spring Tide — 13th January 1891



New Moon — 10th January 1891

Neap Tide — 19th January 1891



First Quarter — 17th January 1891

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun, September 1899.

Regr. No. D. 222, S. I. D. - Aug. 99-500

Values of H's *at Port Blair.*

Tide	H						Tide
	1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·028	0·018	0·016	0·015	0·051	0·006	S_1
S_2	·966	·978	·959	·975	·963	·933	S_2
S_4	·003	·001	·004	·004	·004	·004	S_4
S_6	·002	·002	·002	·003	·001	·002	S_6
S_8	·002	·002	·001	·001	·000	·002	S_8
M_1	·016	·007	·008	·004	·028	·032	M_1
M_2	2·042	2·014	2·010	2·013	2·029	1·951	M_2
M_3	0·004	0·011	0·007	0·009	0·005	0·004	M_3
M_4	·003	·011	·011	·013	·017	·016	M_4
M_6	·004	·002	·000	·007	·002	·008	M_6
M_8	·003	·002	·002	·001	·001	·002	M_8
O	·153	·162	·166	·159	·155	·162	O
K_1	·403	·397	·391	·393	·417	·397	K_1
K_2	·286	·296	·264	·277	·179	·233	K_2
P	·130	·137	·134	·132	·176	·129	P
J	·038	·030	·014	·021	·033	·032	J
Q	·023	·027	·023	·011	·022	·020	Q
L	·059	·098	·046	·093	·049	·087	L
N	·413	·392	·391	·382	·423	·391	N
λ	·035	·046	·047	·036	·087	...	λ
ν	·148	·137	·079	·020	·179	·139	ν
μ	·094	·089	·074	·074	·121	·071	μ
R	...	·020	...	·022	...	...	R
T	...	·099	...	·037	...	·112	T
MS	·004	·016	·007	·004	·007	·006	MS
2SM	·021	·020	·028	·017	·022	·021	2SM
2N	...	·072	·048	·044	·094	·066	2N
M_2N	...	·038	·099	·037	·105	·024	M_2N
M_2K_1	...	·015	·016	·025	·026	·025	M_2K_1
$2M_2K_1$	...	·008	·003	·003	·004	·005	$2M_2K_1$
Mm	·020	·017	·005	·010	·001	·034	Mm
Mf	·056	·067	·048	·053	·036	·048	Mf
MSf	·019	·007	·018	·014	·018	·036	MSf
Sa	·299	·062	·251	·218	·165	·255	Sa
Ssa	·106	·134	·110	·153	·157	·201	Ssa

Values of H's *at Port Blair*—(Continued).

TIDE	H						TIDE
	1886-87	1887-88	1888-89	1889-90	1890-91*	1890-91†	
	Feet	Feet	Feet	Feet	Feet	Feet	
S_1	0·024	0·022	0·018	0·010	0·017	0·013	S_1
S_2	·953	·914	·961	·924	·966	·974	S_2
S_4	·002	·007	·004	·002	·002	·001	S_4
S_6	·003	·002	·001	·001	·001	·001	S_6
S_8	·002	·002	·001	·001	·002	·002	S_8
M_1	·017	·024	·021	·006	·006	·007	M_1
M_2	1·986	1·911	2·052	1·917	1·990	2·021	M_2
M_3	0·007	0·003	0·005	0·009	0·005	0·008	M_3
M_4	·008	·022	·008	·008	·006	·006	M_4
M_6	·006	·006	·002	·002	·001	·007	M_6
M_8	·002	·003	·001	·001	·002	·003	M_8
O	·152	·160	·155	·149	·157	·157	O
K_1	·397	·388	·400	·387	·393	·397	K_1
K_2	·234	·346	·287	·284	·268	·296	K_2
P	·131	·141	·119	·131	·121	·122	P
J	·015	·024	·037	·036	·015	·023	J
Q	·014	·011	·018	·021	·024	·023	Q
L	·083	·112	·065	·084	·068	·102	L
N	·405	·399	·414	·401	·417	·415	N
λ	...	...	...	...	...	...	λ
ν	·100	·050	·079	·114	·127	·088	ν
μ	·080	·069	·086	·069	·090	·094	μ
R	...	...	...	...	...	...	R
T	...	·022	·099	·093	·024	...	T
MS	·003	·020	·006	·008	·013	·011	MS
2SM	·030	·018	·018	·024	·028	·027	2SM
2N	·070	·043	·076	·074	·075	·052	2N
M_2N	·078	·032	·045	·060	·083	·041	M_2N
M_2K_1	·021	·021	·023	·020	·016	·025	M_2K_1
$2M_2K_1$	·005	·007	·007	·008	·007	·005	$2M_2K_1$
Mm	·023	·027	·027	·049	·020	·038	Mm
Mf	·025	·063	·037	·056	·043	·053	Mf
MSf	·027	·036	·011	·025	·012	·013	MSf
Sa	·048	·203	·183	·079	·277	·241	Sa
Ssa	·105	·136	·143	·016	·027	·136	Ssa

* Commencing 19th April, 1890. † Commencing 24th October, 1890.

Values of κ's at Port Blair.

Tide	κ						Tide
	1880-81	1881-82	1882-83	1883-84	1884-85	1885-86	
	°	°	°	°	°	°	
S_1	49·42	34·84	31·03	85·49	28·34	124·99	S_1
S_2	315·51	313·49	314·82	316·24	320·21	321·75	S_2
S_4	106·86	85·60	59·04	108·44	126·03	67·89	S_4
S_6	152·35	98·53	142·13	175·60	167·01	99·46	S_6
S_8	97·77	87·61	53·13	220·60	277·60	113·63	S_8
M_1	22·59	253·83	238·04	312·86	288·03	314·58	M_1
M_2	279·22	277·40	278·45	278·81	282·02	285·19	M_2
M_3	20·38	11·20	15·58	24·52	27·53	41·13	M_3
M_4	167·28	128·16	157·93	98·75	112·31	108·16	M_4
M_6	342·30	206·41	42·24	165·55	133·46	232·71	M_6
M_8	19·00	70·00	119·77	80·27	63·87	55·82	M_8
O	299·12	303·55	302·45	302·20	300·18	304·28	O
K_1	326·43	327·14	326·80	327·52	330·20	332·29	K_1
K_2	313·96	307·82	309·73	315·28	278·59	321·64	K_2
P	324·37	326·79	325·58	323·81	319·02	327·47	P
J	316·27	324·16	333·49	296·85	305·32	347·53	J
Q	236·28	241·86	232·57	255·88	254·77	250·40	Q
L	268·51	290·35	257·87	287·72	327·41	290·85	L
N	273·04	273·00	276·69	271·57	273·67	277·04	N
λ	229·02	311·02	300·96	216·41	175·94	...	λ
ν	294·33	254·46	213·52	332·49	297·56	281·26	ν
μ	288·19	298·00	291·23	315·01	280·13	312·44	μ
R	...	326·15	...	260·54	...	...	R
T	...	312·65	...	354·65	...	290·74	T
MS	153·31	206·39	284·12	183·44	107·15	173·32	MS
2SM	148·67	168·34	145·59	140·06	330·05	181·67	2SM
2N	...	254·35	301·12	240·90	281·89	239·95	2N
M_2N	...	134·86	122·84	166·15	96·96	123·75	M_2N
M_2K_1	...	156·87	242·07	324·89	56·62	154·45	M_2K_1
$2M_2K_1$	...	197·07	237·12	229·46	165·88	259·61	$2M_2K_1$
Mm	12·95	25·71	20·70	34·68	129·34	340·86	Mm
Mf	355·64	14·84	16·61	13·41	31·97	32·17	Mf
MSf	168·31	4·24	9·48	32·70	17·70	354·44	MSf
Sa	162·50	132·87	155·76	179·84	162·47	146·54	Sa
Ssa	165·14	196·96	169·63	176·54	176·25	180·82	Ssa

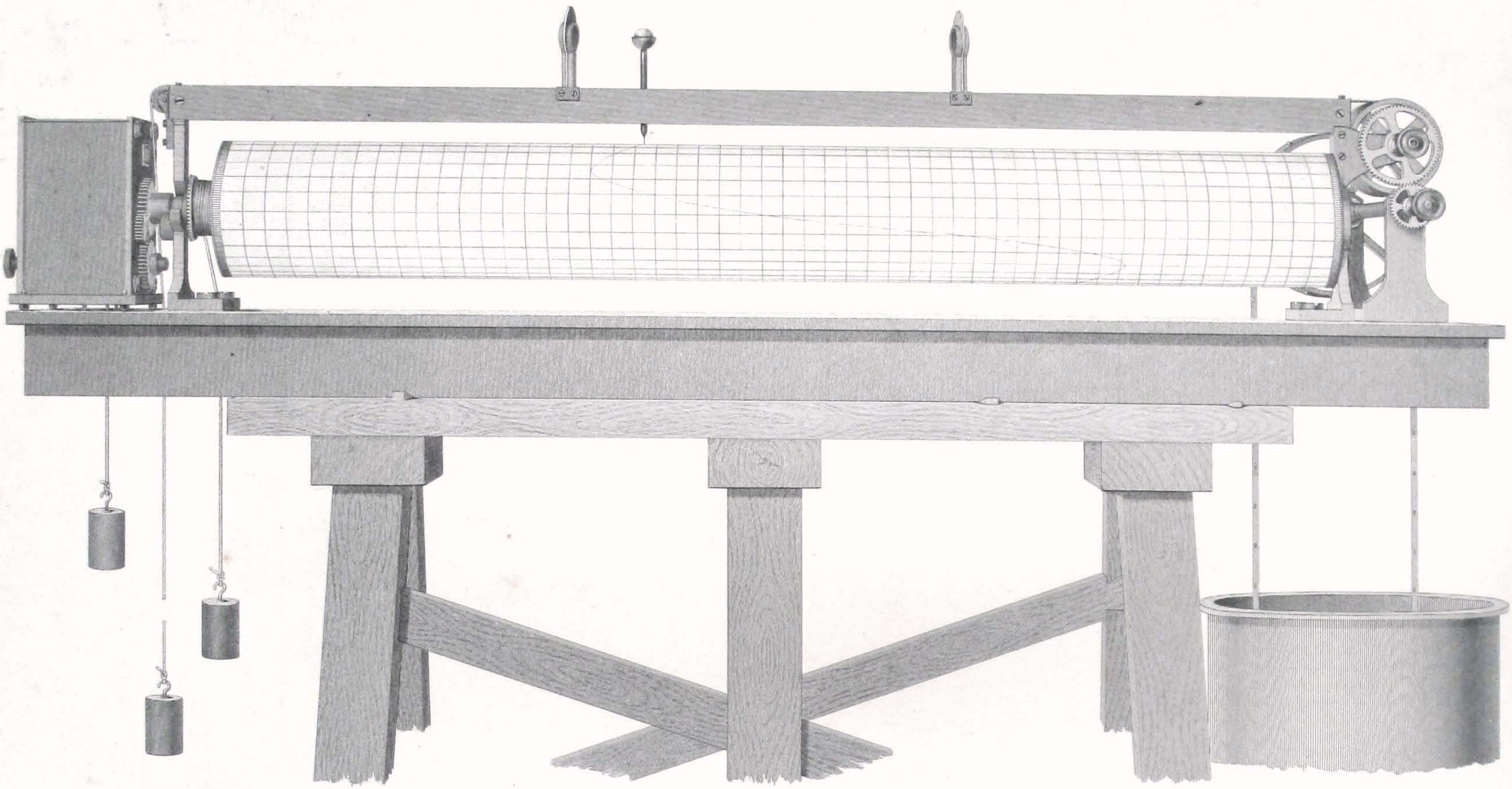
Values of κ's at Port Blair—(Continued).

Tide	κ						Tide
	1886-87	1887-88	1888-89	1889-90	1890-91*	1890-91†	
	°	°	°	°	°	°	
S_1	79·12	56·60	45·00	26·06	58·87	51·34	S_1
S_2	316·73	321·92	313·84	318·57	311·93	312·00	S_2
S_4	256·76	220·14	79·46	83·66	239·93	331·39	S_4
S_6	117·55	203·96	51·34	63·44	138·81	233·13	S_6
S_8	49·76	71·57	100·31	111·80	36·25	43·15	S_8
M_1	321·50	348·45	336·77	22·43	175·37	248·67	M_1
M_2	280·88	286·04	277·55	283·16	276·85	277·04	M_2
M_3	14·03	60·43	32·80	22·79	39·51	40·77	M_3
M_4	76·09	134·02	137·46	121·85	93·20	105·65	M_4
M_6	190·35	114·58	138·00	226·38	240·62	170·98	M_6
M_8	94·94	348·06	14·04	305·31	316·36	319·88	M_8
O	301·63	306·16	302·34	304·72	299·89	299·21	O
K_1	328·49	331·92	326·92	328·62	326·10	326·60	K_1
K_2	311·48	314·60	310·03	319·46	312·03	311·59	K_2
P	325·84	335·56	328·12	327·29	325·82	327·74	P
J	329·82	301·63	318·04	335·45	299·62	308·32	J
Q	213·89	238·50	244·16	219·41	227·32	232·47	Q
L	268·61	293·50	252·96	290·87	268·71	271·09	L
N	272·52	278·97	268·56	278·72	272·04	275·74	N
λ	...	...	...	...	...	...	λ
ν	232·64	228·30	317·12	285·73	241·76	223·89	ν
μ	285·46	313·43	294·64	307·98	284·69	290·99	μ
R	...	...	...	...	...	...	R
T	...	338·63	328·56	308·84	287·40	...	T
MS	345·31	197·76	312·60	236·56	261·49	289·84	MS
2SM	145·85	155·22	176·27	140·97	144·44	135·16	2SM
2N	282·10	244·10	257·91	245·80	273·09	267·46	2N
M_2N	138·41	206·94	130·13	84·54	160·20	291·15	M_2N
M_2K_1	234·58	314·84	48·15	165·21	250·32	352·48	M_2K_1
$2M_2K_1$	264·40	188·01	207·80	214·88	215·84	231·48	$2M_2K_1$
Mm	9·53	34·18	20·73	46·83	260·77	289·62	Mm
Mf	294·35	352·80	6·57	359·02	14·16	358·23	Mf
MSf	73·51	17·27	281·43	47·90	94·40	111·59	MSf
Sa	124·85	172·94	125·79	347·63	152·77	130·92	Sa
Ssa	236·55	171·73	180·38	217·56	234·66	163·71	Ssa

* Commencing 19th April, 1890. † Commencing 24th October, 1890.

SELF-REGISTERING TIDE GAUGE,

Constructed for the Government of India.



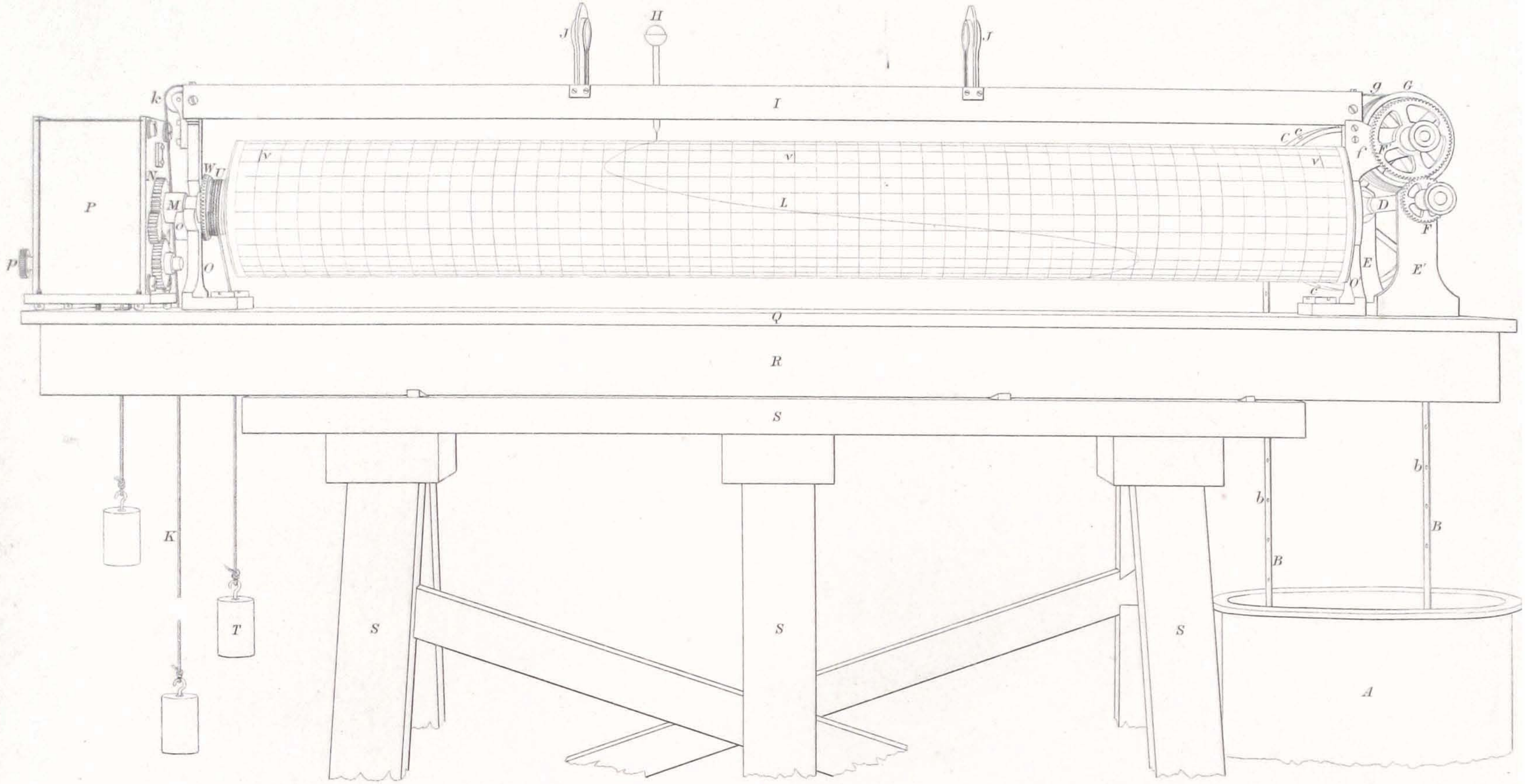
Engraved at the Survey of India Offices, Calcutta, December, 1891.

S.M. Coard, Sc.

Plate 1.

SELF-REGISTERING TIDE GAUGE,

Constructed for the Government of India.



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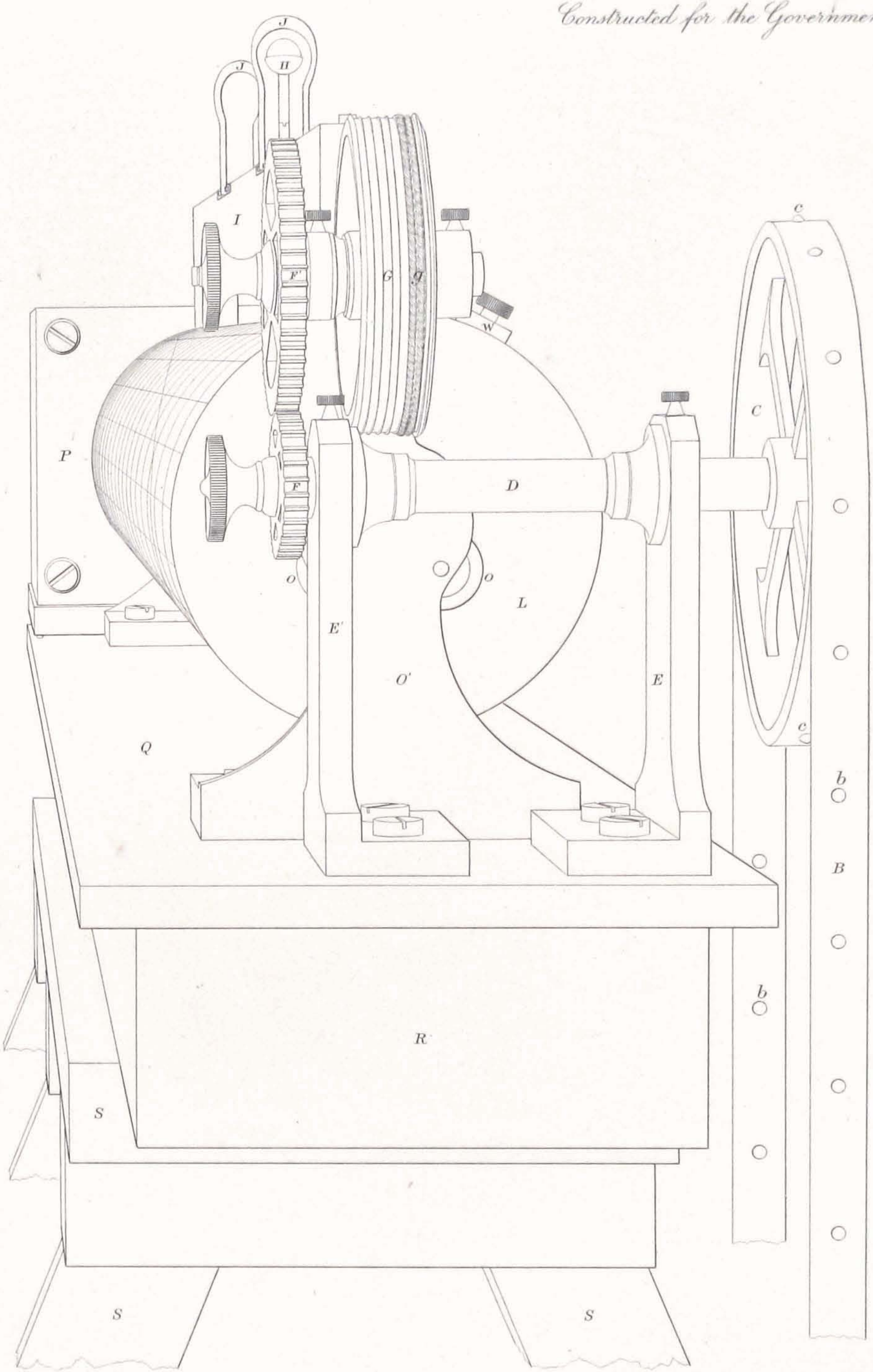
SELF-REGISTERING TIDE GAUGE,

Constructed for the Government of India.



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SELF-REGISTERING TIDE GAUGE,

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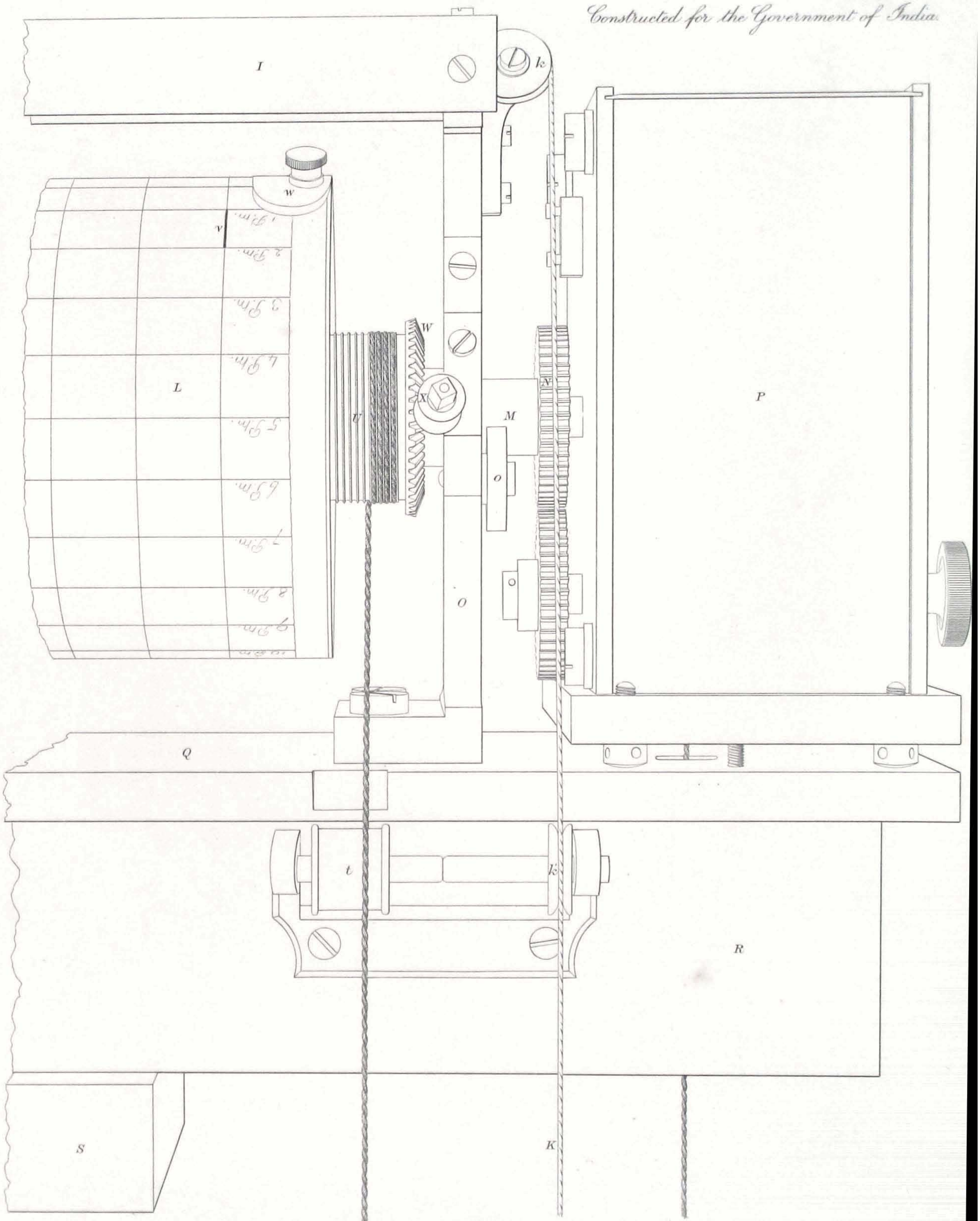

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S. M. Coard, Sc.

Plate IV

SELF-REGISTERING TIDE GAUGE,

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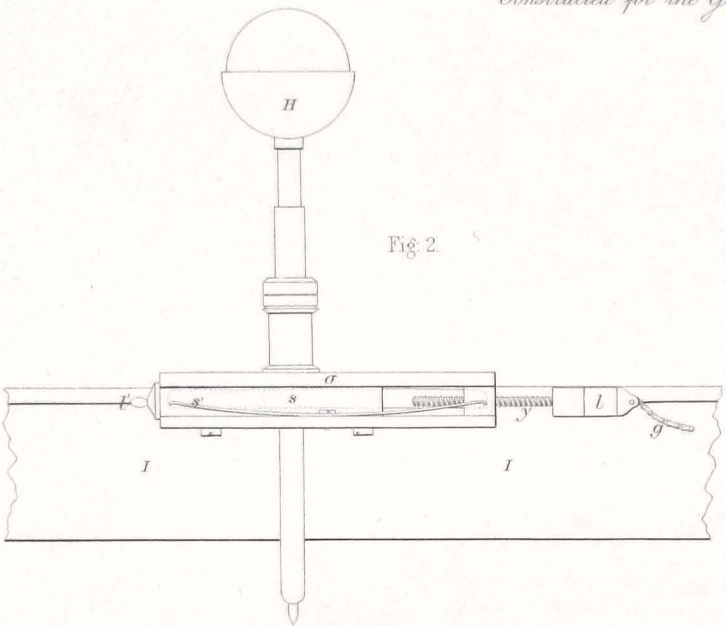


Fig: 2.

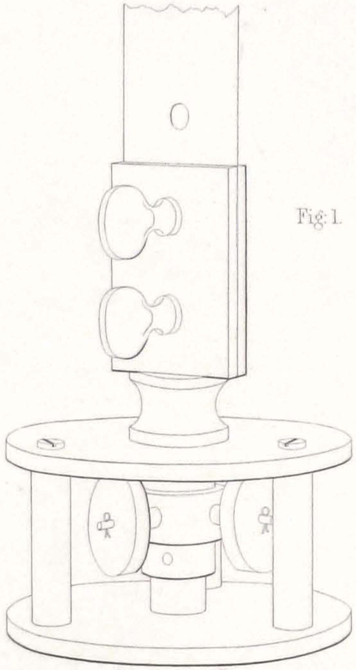


Fig: 1.

Fig: 3.

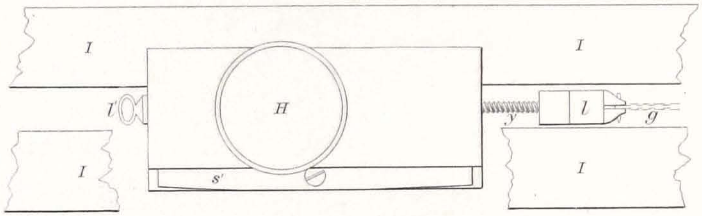
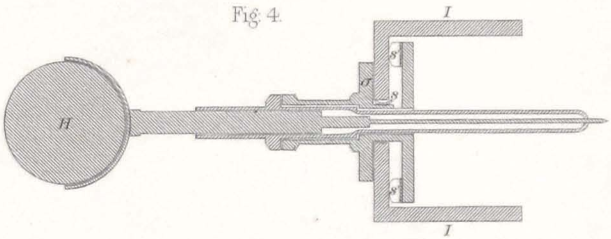


Fig: 4.



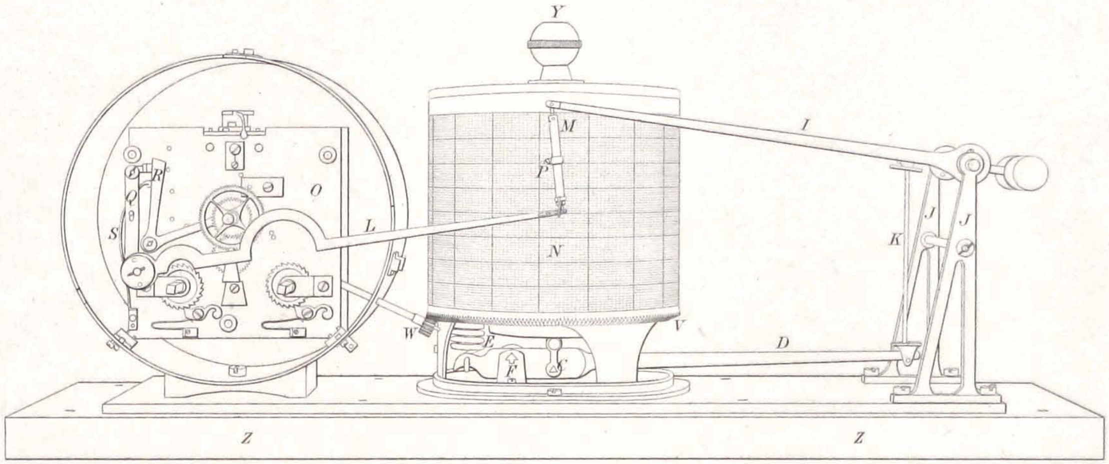
S.M.Coard, Sc.

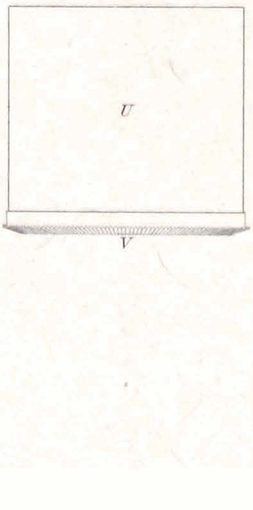
Engraved at the Survey of India Offices, Calcutta, March, 1892.

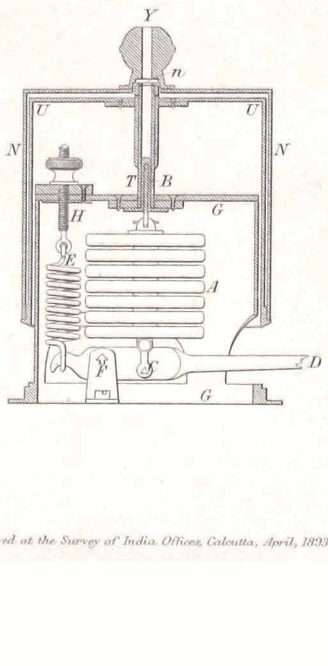
SELF-REGISTERING ANEROID,

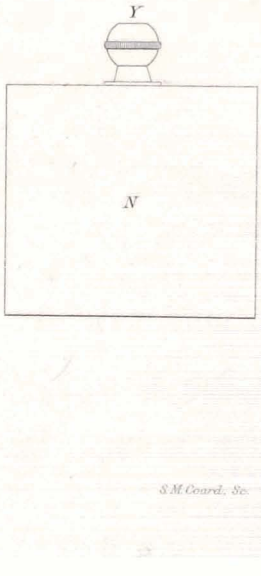
BY MESS^RS A. LÉGÉ & C^O

Constructed for the Government of India.









S. M. Coard. Sc.

Engraved at the Survey of India Offices, Calcutta, April, 1893.

SELF-REGISTERING ANEMOMETER,

Constructed for the Government of India.

Plate VI.

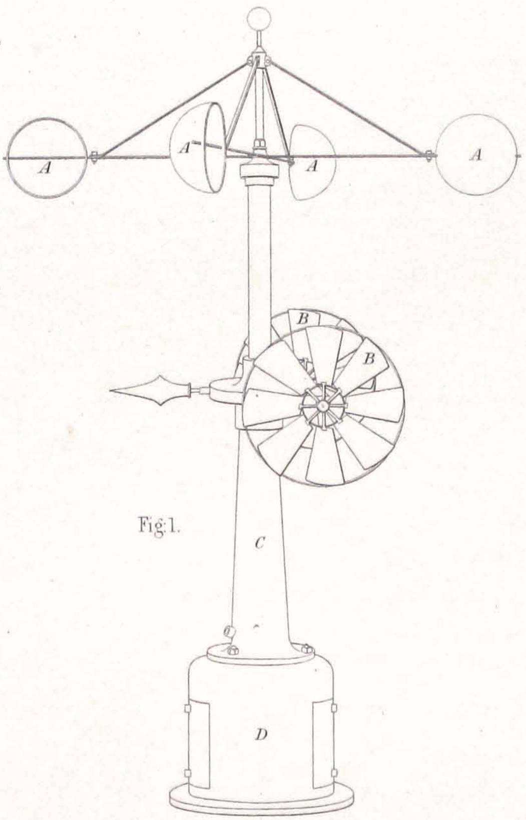


Fig: 1.

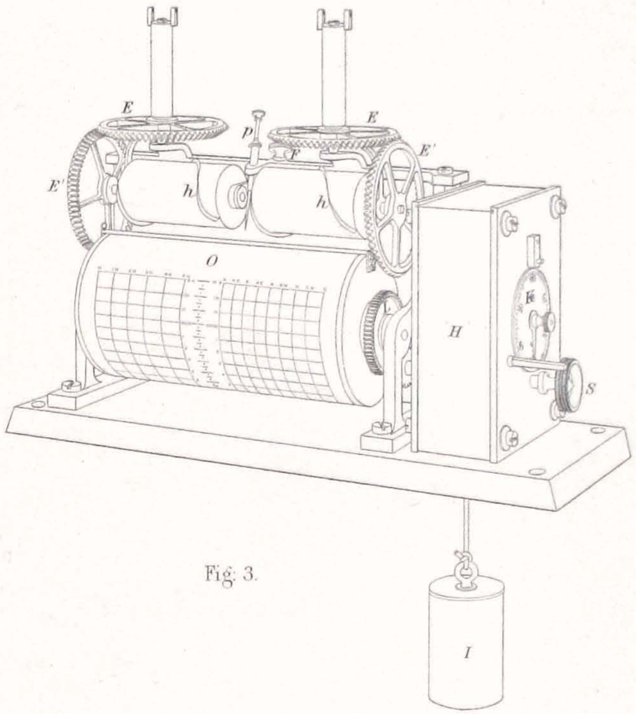


Fig: 3.

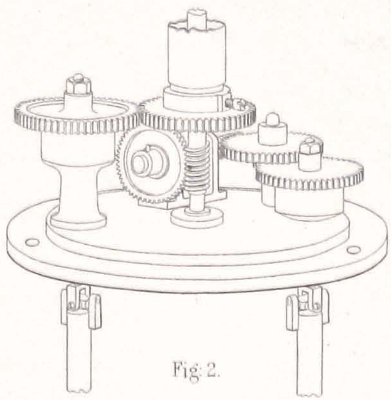


Fig: 2.

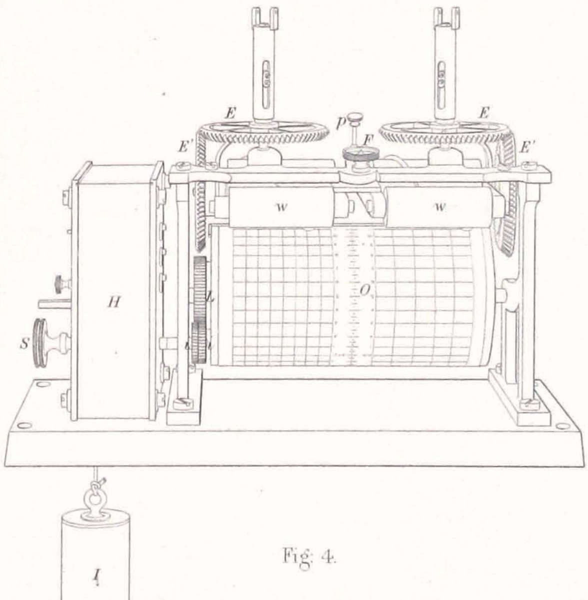


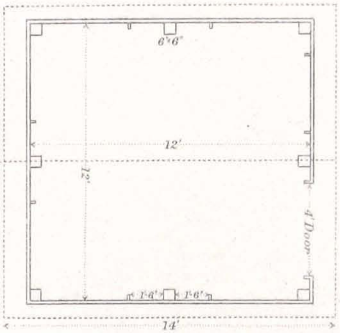
Fig: 4.

S.M.Coard, Sc.

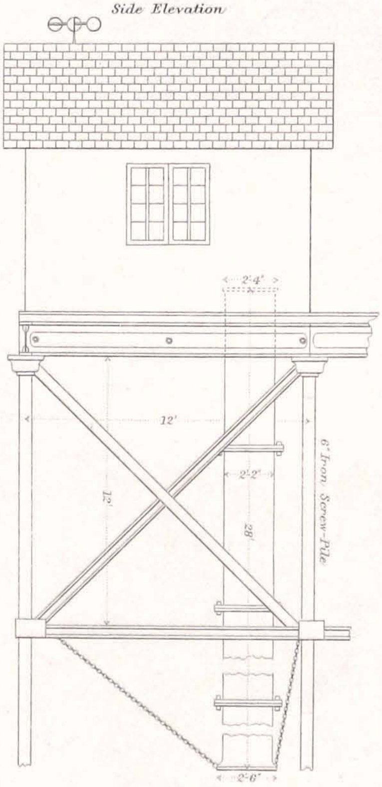
Engraved at the Survey of India Offices, Calcutta, February, 1893.

AKYAB
TIDAL OBSERVATORY.

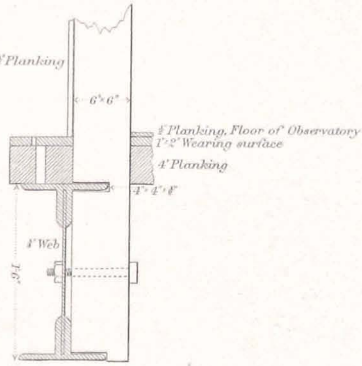
Plan of Ground-Floor



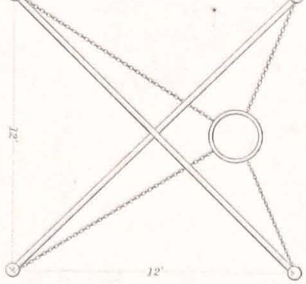
Side Elevation



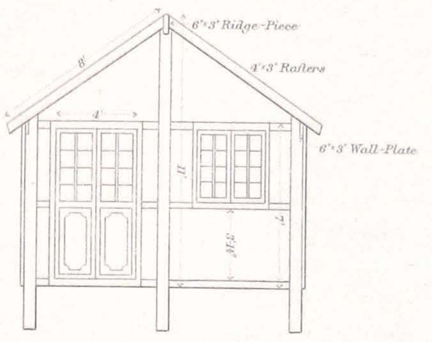
Details of fixture of Posts to Girders of Pier



Plan showing Cylinder



End Elevation



Engraved at the Survey of India Offices, Calcutta, May 1892.

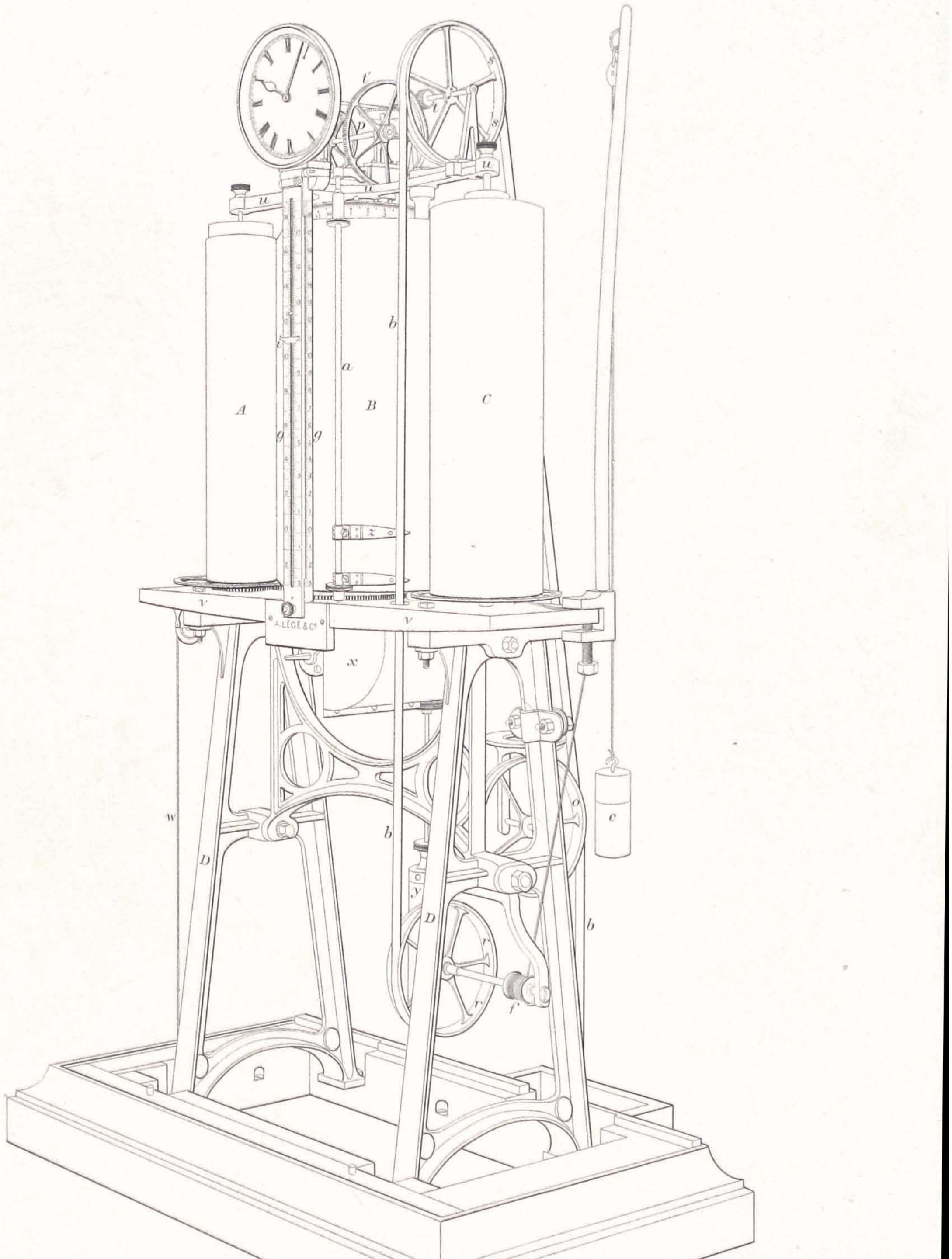
S.M. Coard, Sc.

VERTICAL SELF-REGISTERING TIDE GAUGE,

BY

A. LÉGÉ & C°

Plate VIII



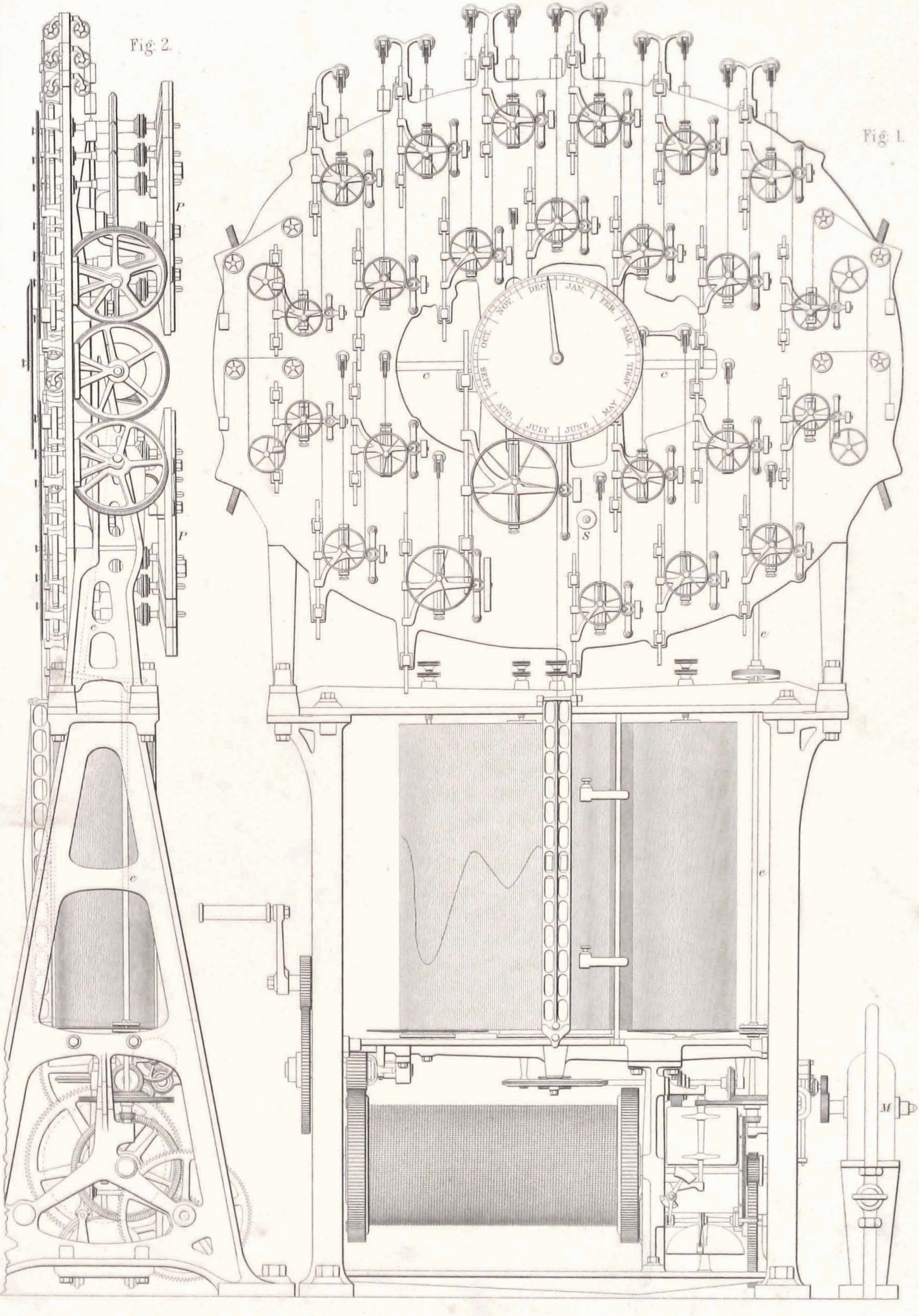
Engraved at the Survey of India Offices, Calcutta, January, 1893.

S.M.Coard. Sc.

TIDE-PREDICTING MACHINE

BY

A. LÉGÉ & C°



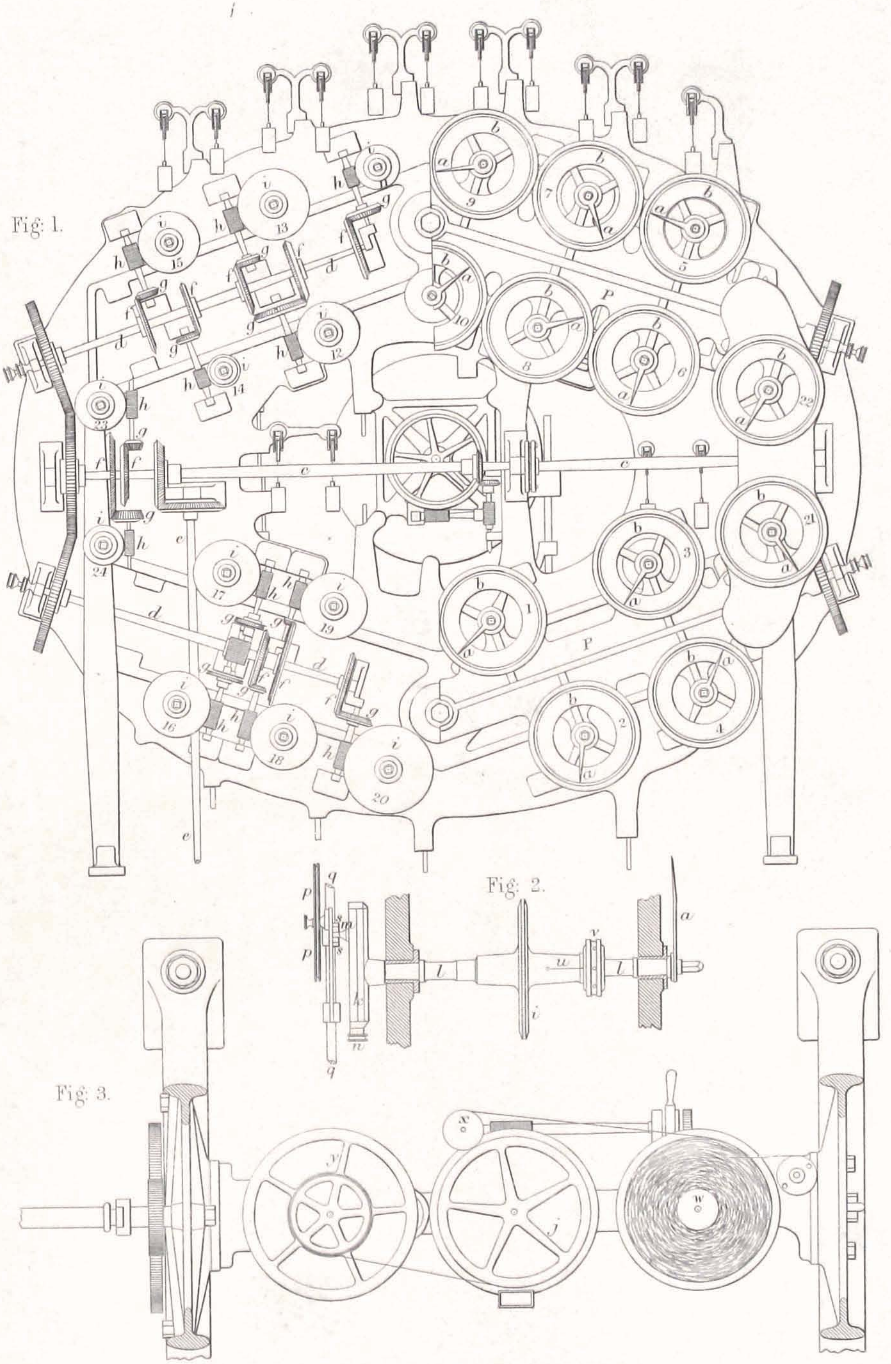
Engraved at the Survey of India Offices, Calcutta, January, 1895.

S.M. Coard

TIDE-PREDICTING MACHINE.

BY

A. LÉGÉ & C°

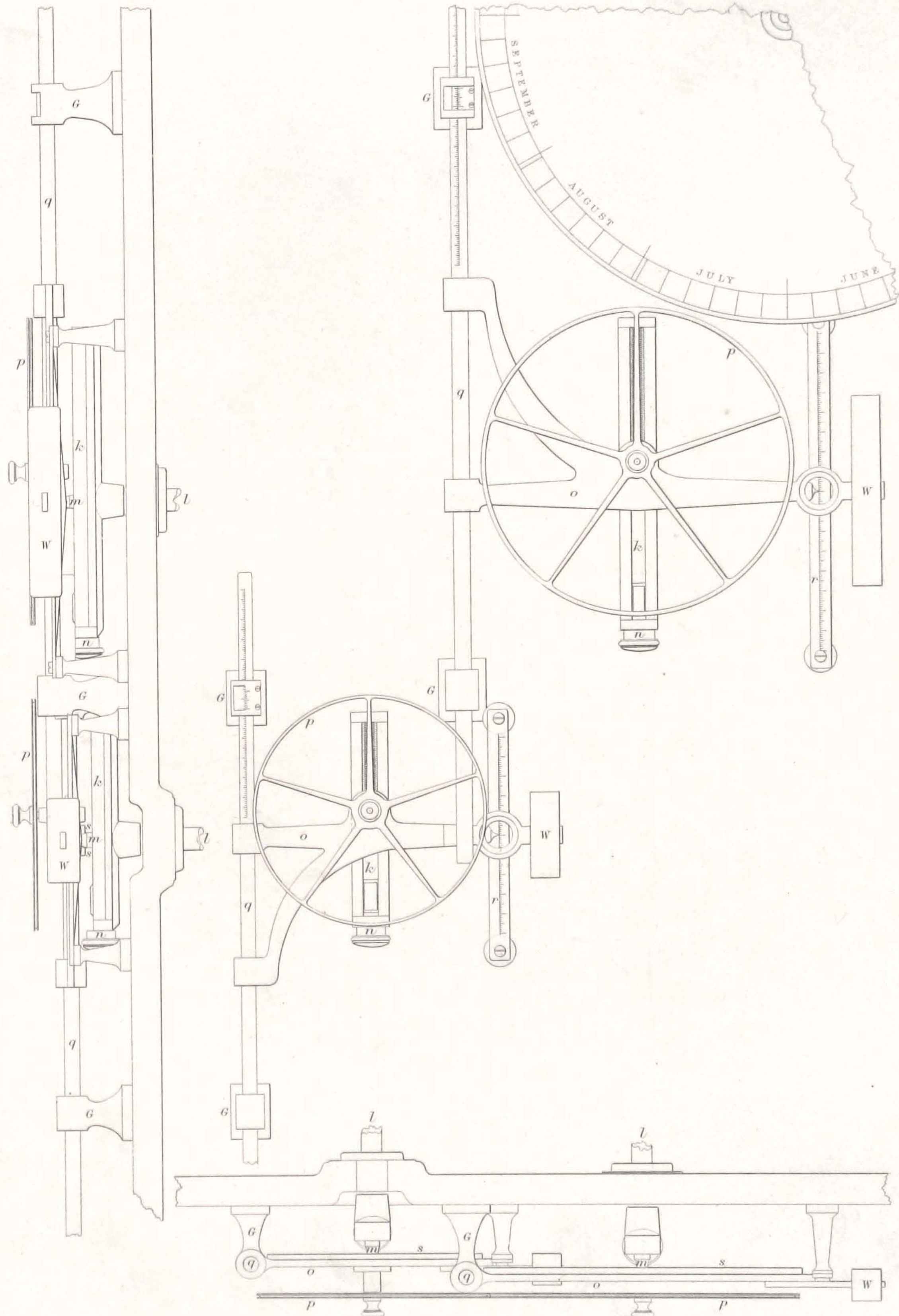


Engraved at the Survey of India Offices, Calcutta, November 1894.

TIDE-PREDICTING MACHINE.

BY

A. LÉGÉ & Cº



Engraved at the Survey of India Offices, Calcutta, December 1894.