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C. G. MANNERHEIM
ACROSS ASIA
FROM WEST TO EAST
IN 1906-1908

II

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**THE
MANNERHEIM ARCHAEOLOGICAL COLLECTION
FROM EASTERN TURKESTAN**

BY

A. M. TALLGREN

I.

A fairly large collection of ethnographical and archaeological objects is preserved in the National Museum of Finland in Helsinki, made in 1906—1908 by Colonel (now Field-marshal) GUSTAF MANNERHEIM during his journey across Central Asia and acquired for the future National Museum of Finland by the Trustees of the Antell collections, appointed by the former Finnish Diet. The collections were received by the Museum in five instalments, the last in January 1909. They consist principally of various «ethnographical» modern objects and thus illustrate the life and culture of the Central-Asiatic peoples at the beginning of the present century. In addition to the ethnographical materials the Mannerheim collection contains a small, but valuable assemblage of archaeological finds coming with few exceptions from Eastern Turkestan, mostly from the oasis of Khotan. These relics are chiefly of a secular and, to a lesser degree, of a sacral character. They represent cultures that flourished at the beginning of the Christian era and in the following centuries in townlike religious and commercial communities in the oases of Eastern Turkestan, along the western part of the caravan route, the so-called great silk road between China, Bactria and the Roman Empire.¹ This remarkable Central-Asiatic culture and its local products include, as we know, strains both of the Greco-Bactrian, Indian and Chinese «high» cultures as of the different nomadic cultures of the Asiatic steppes. Buddhism was of paramount importance.

It was in the 1890's that the ancient monuments of Eastern Turkestan began to attract attention. During their journeys of geographical exploration certain European scientists collected antiquities from the local population and described ancient ruins, some of them embedded in the sands of the desert. Of these earliest explorers DUTREUIL DE RHINS² (1891), killed on his journey in 1894, and SVEN HEDIN³ (1896) should be mentioned. In the same

¹ C. G. SELIGMAN, *The Roman Orient and the Far East*. *Antiquity* 1937, pp. 5—30.

² F. GRENARD, J. L. Dutreuil de Rhins. *Mission scientifique dans la haute Asie 1890—95*. Vol. III, section archaeology. Paris 1898.

³ SVEN HEDIN, *En färd genom Asien 1893—97*. Stockholm 1898; Id., *Die geographisch-wissenschaftlichen Ergebnisse meiner Reisen in Zentralasien 1894—97*. *Petermanns Mitteil., Ergänz.* No. 131. Gotha 1900. — In 1936 and 1938 Dr. G. MONTELL published two well documented and well illustrated essays on Hedin's collections in *Bulletin* No. 7 and 10 of the *Museum of Far Eastern Antiquities* in Stockholm under the title *Sven Hedin's archaeological collections*

decade the Russian consul N. Petrovsky made a small collection of antiquities in Khotan. It was published in 1896 by the keeper of the Imp. Hermitage G. Kieseritzky in a short, but very good paper. The pictures given in his investigation are not bad.⁴

At the beginning of the present century scientific interest in Central Asia increased at a rapid pace and several scientific expeditions were despatched to Central Asia in order to describe, map and investigate ancient ruins of towns, monasteries and other sacred places and to collect fresh works of art, manuscript documents and scattered finds in the earth for the big museums in Europe and Asia. One of the first, in 1900, was SIR AUREL STEIN, a geographer and explorer of high repute in the Anglo-Indian service. During his 40 years of exploration in Eastern Turkestan, Beluchistan, Iran, India and Tibet he established the physiognomy of the region and shed light on its ancient history. His knowledge is embodied in great works, of which the following are the most important:

Ancient Khotan I—II. Detailed report of archaeological explorations in Chinese Turkestan. London 1907.

Serindia. Detailed report of explorations in Central Asia and Westernmost China I—II. Oxford 1921.

Innermost Asia. Detailed report of explorations in Central Asia, Kansu and Eastern Iran. Oxford 1928.

Other investigators of the early historical cultures in Eastern Turkestan⁵ from the time before and after the Great War include the Russians D. KLEMENTZ⁶ and S. OLDENBURG⁷, the Frenchman Prof. P. PELLIOU⁸, the Germans Dr. A. GRÜNWEDEL⁹ and A. VON LE COQ,¹⁰ and the last Sven Hedin expedition, of whose members Dr. G. MONTELL³ has devoted himself to archaeology, and a few others.

from Khotan I—II, 77+31 pp.+20+10 pl. — I have derived invaluable benefit from these essays and from conversations with Dr MONTELL in Stockholm in the summer of 1938 and take this opportunity of thanking him for his kind assistance.

⁴ G. KIESERITZKY, *Хотанскія древности изъ собранія Н. Ф. Петровскаго. Записки вост. отд. И. Русск. арх. общ.* IX. 1896, p. 167 sq.

⁵ Stein's and other collections of small archaeological objects from Khotan, in primo loco the terracottas, were published early in a marvellous masse by A. F. RUDOLF HOERNLE, *A report on the British Collection of Antiquities from Central Asia. Part II. Journal of the Asiatic Soc. of Bengal.* LXX. Part 1. Extra-Number 1. 1901. Calcutta 1902. — This work, and especially the part devoted to terracotta finds, is remarkably instructive and wise. — HOERNLE'S, STEIN'S and MONTELL'S works are the best researches we possess concerning the antiquities from the western part of Eastern Turkestan.

⁶ D. KLEMENTZ, *Turfan und seine Alterthümer. Nachrichten über die von K. Akademie der Wissenschaften zu Sankt-Petersburg im Jahre 1898 ausgerüstete Expedition nach Turfan.* Heft 1. S. Petersburg 1899.

⁷ OLDENBURG'S expedition worked in East Turkestan in 1909/10 and 1914/15. Oldenburg published a general report of his expedition in 1914: *Русская Туркестанская экспедиция 1909—1910 года.* S. Petersburg 1914.

⁸ P. PELLIOU, many works, especially *Les Grottes de Touen-Houang.* 1—6. Paris 1920/1924.

⁹ A. GRÜNWEDEL, *Altbuddhistische Kultstätten in Chinesisch-Turkistan.* Berlin 1912.

¹⁰ A. VON LE COQ: *Chotscho.* Berlin 1913. — LE COQ'S journey was made to Turfan in 1904—1906. — Id., *Buddhistische Spätantike in Mittelasien.* 1—4. Berlin 1922—1924. — Id., *Bilderatlas zur Kunst und Kulturgeschichte Mittel-Asiens.* Berlin 1925. — The mural pictures in Turfan give an impression of seigneurial pictures like those from European castles of the Middle Ages.



Fig. 1. 10/11. (311).

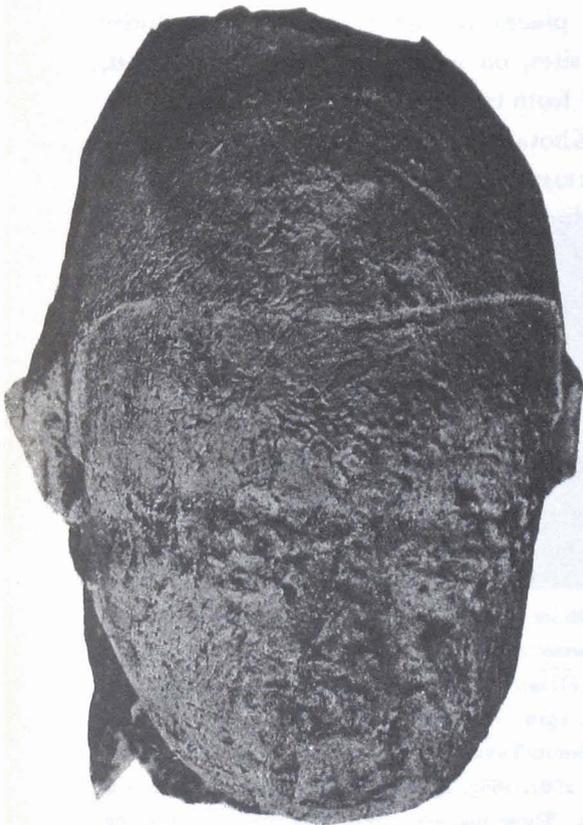


Fig. 2. 11/12. (365). Myslyk.

It was chiefly Senator OTTO DONNER's influence and interest in Finland and the researches of Hedin, Stein, Grünwedel and Pelliot, perhaps, too, Petrovsky's collections that aroused Mannerheim's interest — he travelled partly in the same regions as they — in becoming an archaeological collector. For the National Museum of Finland the Mannerheim collection represents a very valuable acquisition. The Museum does not possess any other antiquities from Eastern Turkestan and only a very few from Western Turkestan (finds from tumuli in the valley of the river Talas)¹¹ and from Mongolia¹² (illustrations and maps of distribution of antiquities). On the other hand the Museum possesses antiquarian collections from Southern Siberia, especially from the basin of the Yenissey¹³, on which light is thrown to some extent by the Turkestan finds, in spite of their entirely different character. I will revert to this question later.

The Mannerheim collections are all catalogued in the main catalogue of the »Foreign ethnographical section» of the National Museum, under Nos. 4803. 1—640 and 4833. 1—252. The archaeological finds, the only ones to be described here, are catalogued under Nos. 4803. 279—446, 529—535, 626—638 and 4833. 235—250. By far the most numerous of these finds (4803. 279—364) come from Yotkan, a few kilometres W of the present Khotan, but finds were also made at the following places in this oasis: Myslyk, E of Khotan, Islamabad on the W bank of the Yurung-Qash, about 40 km NNE of Khotan, »Tati», S of Jamada, about 10 km S of Khotan, Hangiya, Aq-sepil and Keriya E of Khotan. Besides, the catalogue contains coins from these and other places in the neighbourhood under Nos. 4803. 441—446 etc. In general, however, the sites, on which the coins were found, are not known with certainty, as they were obtained from treasure hunters and art dealers. — The sites referred to are situated in the oasis of Khotan, or its immediate surroundings, S of the Taklamakan desert (see above, MANNERHEIM's relation, p. 87 sq.).

Another group of places, whence finds are included in the Mannerheim collection, lies further north, to the north of this desert, along the NW edge of which Mannerheim travelled to Qulja and thence eastward to Turfan. The following sites of finds are situated there: Maral Bashi, Aqsu, Qulja, Qucha (Chotscho), Qarashahr, Qara Khoja (Idygot-shahr), Yar Khoto or Yar Gholy — old capitals of this region, — Toyuk, Turfan. South of Turfan lies Lou-lan, the early Chinese military station with very important finds (about 40° N latit. and 90° East. longitude).

¹¹ H. J. HEIKEL's excavations in 1903. Hels. Mus. 3661 and 3745. Published under the title *Altertümer aus dem Tale des Talas in Turkestan. Travaux ethnographiques VII.* Hels. 1918. — Besides, finds from 6 kurgans in the Bukharma valley, excavated by Baron L. MUNCK and Mag. I. VALLENIUS in 1896. Hels. Mus. 3508.

¹² Cf. J. G. GRANÖ, *Archäologische Beobachtungen von meinen Reisen in den nördlichen Grenzgegenden Chinas in den Jahren 1906 und 1907.* — Id., *Archäologische Beobachtungen von meiner Reise in Südsibirien und der Nordwestmongolei im Jahre 1909.* — Id., *Über die geographische Verbreitung und die Formen der Altertümer in der Nordwestmongolei.* — *Journal de la Soc. Finno-Ougrienne* 26. 3, 28. 1, 28. 2. Hels. 1909, 1912. — In the National Museum of Finland there is a bautastone with an ancient Turkish inscription, from Tannu-Tuva, brought back by Prof. GRANÖ.

¹³ Hels. Mus. 2431. 1—23, 2599, 2600, 2601, 2681, 2681 B, 2682, 2683, 2784, 6967, 7267, 7692. There is a short list of them in *Eurasia Septentrionalis Antiqua III*, pp. 142/145. These materials were published partly in the monography *Collection Tovostine*, Hels. 1917, and in *Suomen Muinaismuistoyhdistyksen Aikakauskirja (= SMYA)*, vol. 29.

The collection of the archaeological finds related to the history of the region of the Eastern Turkestan is presented in the present volume. The finds are arranged in the order of their discovery and the order of their importance. The collection includes a large number of objects of various types and materials, which are of great interest for the study of the history and culture of the region.



Fig. 3. About 1/2. (347).

The object shown in Fig. 3 is a fragment of a dark, possibly fired clay or stone material. It is irregularly shaped and appears to be a fragment of a vessel or a small figurine. The top view shows a rounded, somewhat flattened shape with a textured surface. The bottom view shows a more elongated, curved shape, possibly a side profile or a different angle of the same object. The object is approximately 1/2 inch in size and is numbered 347.

The position of the sites and their relation to each other will be seen on the map. The majority are situated in the Tarim basin and are concentrated in its southern part, in the oasis of Khotan, on the rivers Qaraqash and Yurung-Qash. The wealthiest and most productive site was Yotkan in the canton of Borazan, the ancient capital of the oasis, from which the greater part of the »Khotan» finds in various museums is obtained. Sir A. STEIN alone made large scientific excavations there. The finds from Yotkan in the Mannerheim collection, like the finds from the same place in most other museum collections, were discovered and subsequently sold by local gold washers and treasure hunters. This digging for treasure at Yotkan continued, at first on a very small scale, since 1870; at that time a new ravine (»yar») was formed in the spring and exposed pieces of terracotta plastic work below the sand. Several of the lost wooden sculptures proved to have been covered with gold-leaf¹⁴ and this was discovered by the local population. Some officials and travellers were interested in antiquities and bought up curios for small sums. This traffic continued until about 1900, and even after Stein's excavations, e.g., during Mannerheim's visit in 1907, and still later, in 1924. In general no particulars of the finds are available beyond »Yotkan», nor would they be likely to possess any great scientific importance in regard to the present position of the culture layers. There are no structural remains to be found there. The houses were certainly built of unbaked clay bricks and wood and have totally disappeared.

The oasis of Khotan is comparatively large and fertile. Nowadays it has a population of 200,000—300,000 (the information varies very greatly) which is not nomadic: nomads, in the usual sense of the word, would find it difficult to gain a livelihood there. About 1200 years ago the oasis extended slightly further north than at present along the rivers Qara and Yurung, this part of it having been swallowed up again by sand. The Khotan and the Yurung-Qash are the only rivers from the direction of Khotan that reach the Tarim. The other southern rivers (e.g. Keriya darya and Niya darya), all of which rise in the high, snowclad range of Kun Lun and carry down white water (»aq su»), dry up and »die» in the sandy desert.

Rice, cotton and fruit-trees are grown in the oasis. Handicrafts (industries) are carried on there: carpet weaving, silk spinning, pottery making, metal and glass industry etc., all of them being old-established in the oasis. Raw materials are available locally: some gold and semi-precious stones, such as jade of different colours, cornelian, amethyst, agate etc. in the Kun Lun. — In spite of this, however, the oasis only gained some economic importance comparatively late. Its position is remote, though well protected. From the south, over the Kun Lun, an enemy could not penetrate to it, nor from the north, across the Taklamakan desert.

The oasis of Khotan only played an important economic and cultural part during the Han period, during the centuries just before and after the birth of Christ and afterwards, during the entire first millennium A.D. At that time strong influences from Bactria, India (Buddhism!) and China made themselves felt: the economic and cultural progress

¹⁴ »Gilding of sacred images must have been largely practised in Buddhist Khotan», says STEIN, *Anc. Khot.*, p. 192, 194. — Only a few specimens of work in precious metal are known from Khotan. MONTELLI, II, p. 94.

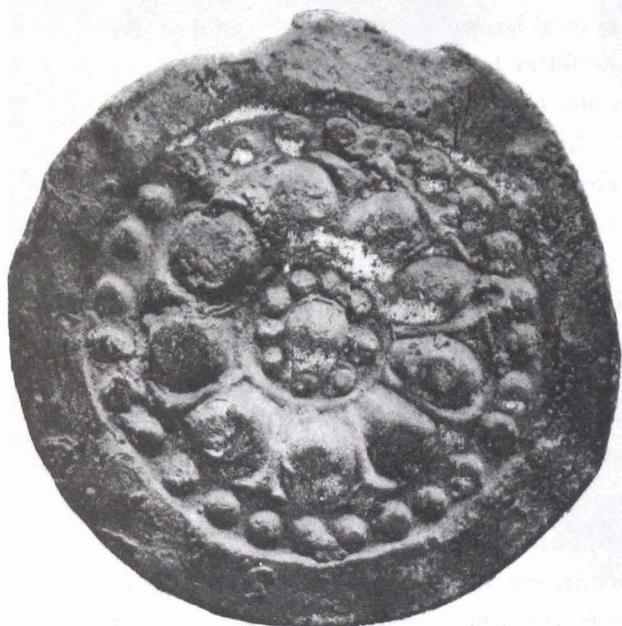


Fig. 4. About 8/13. (348).



Fig. 5. About 10/11. (370).



Fig. 5A a-b. About 8/11. 4804. 17.

culminated in the opening and development of the »silk road«, especially during the first two centuries A.D. A few words concerning conditions in Turkestan at that time should not be out of place in order to understand the antiquities illustrated below.

The earliest mention of *Yotkan*¹⁵, which was for several happy centuries the capital of SW Eastern Turkestan occurs in Chinese sources in the latter half of the second century B.C. Khotan was at that time the centre of a Buddhist state, in which an East-Iranian language, Khotani or Saka, was the principal language. It had an Indo-Sakian upper class and Iranian population (perhaps with some Tibetan elements?). The Kharoshthi script that originated in Taxila and was derived from Aramaic was largely used there.¹⁶ Yotkan cannot have been a very ancient town at that time (from the third century B.C.?): its culture originated elsewhere, built up on an Indian foundation (Taxila) with later contributions from Bactria, partly too from China (MONTELL I, p. 149). The town was captured by the Chinese in the year A.D. 73, but continued to flourish and soon attained great importance, even politically. About A.D. 130 there is mention of its king Kanishka, the great Indo-Scythian founder of a North-Indian kingdom; the Kharoshthi remained the script for public administration, but was displaced by Sanscrit as the language of religion.

The origin and prosperity of Yotkan were due to *trade with distant parts*. The camel and horse were the principal draught animals. No *prehistoric* finds have been made within its area and up to the present they are very rare in the whole oasis.¹⁷ As a capital and a trading town Yotkan became a centre of religion and culture in the southern part of Eastern Turkestan. There were manufactories there: for carpets, for articles of haircloth, silk, jade. There were many monasteries and a lot of Buddhist clérécies and monks.¹⁸ Many written documents, indicating relations, exist from its prosperous era. The neighbouring Great Powers in the east (China, later the Turks), west (the Sogdians in Samarkand, Bokhara) and south struggled for influence there. The oldest and strongest ties were with India and Bactria. During the later Han period and for the second time in the T'ang period the Chinese influence was strongest: China was twice absolute master of Khotan. In 649 Khotan was one of the famous Four Garrisons and was Chinese from about 649 to 790. In the interval, about 200—600, the »White Turks« (502—556) and the Parthian Yüeh-Chich held sway over Khotan and Yotkan. After Chinese rule had ended, the Tibetans and the Uigurs ruled Turkestan. China established her influence once more, but about the year 1006 Khotan fell into the hands of the Turks, Yotkan was destroyed and the

¹⁵ STEIN, *Anc. Khot.*, p. 171. MONTELL, *op. cit.*, p. 149: the Chinaman Hsuan Tsang's narrative of A.D. 644. With regard to the Chinese sources and their particulars about the buildings, fortifications etc. of Khotan, see STEIN, *op. cit.*, pp. 166 ff. About agriculture, industries, works etc., *Ibid.*, p. 130. Stone implements. s. STEIN, *Innermost Asia* II, Appendix N (by R. A. SMITH). Other papers on Central Asiatic Stone Implements, see *Man* 1911, 81 (R. A. SMITH) and MONTELL I, p. 95. FOLKE BERGMAN, *Archaeological researches in Sinkiang* I. Stockholm 1939, p. 14--37.

¹⁶ MONTELL I, p. 146, 147.

¹⁷ Undoubtedly, the desert of Eastern Turkestan still conceals the ruins of other sand-buried towns that perished, when the trade routes became lifeless, the irrigation canals became choked and town life became impossible. — See the note 15.

¹⁸ STEIN, *Serindia*, p. 93 sq.



Fig. 6. 4/5. (380).



Fig. 7. 4/5. (379).



Fig. 8. 2/3. (378).



Fig. 9. 1/1. (383).

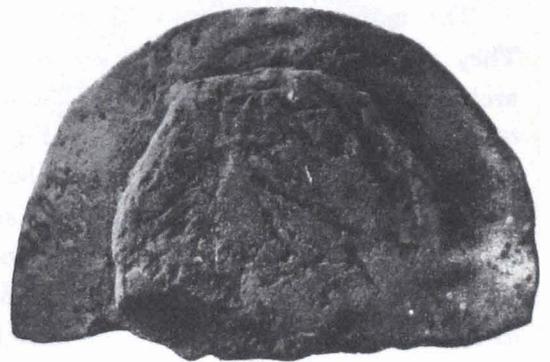


Fig. 10 a-b. 1/1. (384).



Fig. 11 a-b. 3/4. (386).



Fig. 12. 1/1. (385).

Fig. 6—12. Myslyk.

inhabitants of the oasis became Mohammedans. Formerly they had been Buddhists, but Zoroastrianism and Manicheism had also established themselves strongly at a comparatively early date in Eastern Turkestan, especially north of the Taklamakan.

The influence of distant states and cultures was felt in Yotkan-Khotan, either in the form of imported articles or by means of specialists or wandering monks, artisans, merchants and vagabonds. Their number was certainly very large. We must think of the part played by Syrians, Jews, gypsies, not only by the so-called higher cultures and upper classes. This would seem to be reflected by material culture. Scientists have explained, what a centre of religion, literature, art and even handicraft Eastern Turkestan, and in its Southern part particularly Yotkan, was during these centuries until Islam and the Central Asiatic Turkish tribes gained their decisive victory. Then the town of Yotkan perished, as did many other most important cultural centres of Eastern Turkestan too, about the year 1000. According to tradition Yotkan was burnt and a rivulet was led into the place. This may be so but it is not certain.

From the tenth century to the end of the nineteenth Yotkan was »an accumulation of débris at a site continuously occupied for centuries»; digging for treasure began, as already mentioned about 1870.

Myslyk lies E of Khotan according to Mannerheim. This is most probably the place known in other works by the name of Yurung-Qash. Mannerheim gives this name in brackets.

The finds we have from Myslyk (4803. 365—388) make a very uniform impression. They include a stucco head (Fig. 2), Medusa-head tiles (Fig. 5 and No. 4803. 371), architectural ornaments (Fig. 4), Buddha images (Fig. 15—17 and No. 4803. 387), various other objects (Fig. 6—12), a weight (Fig. 87) and a kneeling monkey (4803. 369). The last probably does not come from this place, but from Yotkan. All the other finds, mural decorations of stucco and terracotta, are almost identical with the finds excavated by Sir Aurel Stein at Rawak, where there was a richly decorated vihāra or monastery, built of unbaked clay bricks and wood. The ancient monument can be dated excellently by means of finds of coins: it dates from the later Han period (approximately the first two centuries A.D.) and the ornaments represent the Gandhara culture. If Yotkan was a trading town, Rawak was a site of religion and art.

The *Turfan* neighbourhood at the eastern end of the Tarim basin NW of the Lop-Nor was another centre of trade between China and the west. As Mannerheim's collection from the Turfan neighbourhood is rather insignificant, I will mention the history of its civilisation as briefly as possible, while referring the reader to the new discoveries in Lou-lan and to LE COQ's big work on Idiqu-schāri or Chotscho. Chotscho was above all a town of many temples, tombs etc. and only one large secular building, a royal palace. The town is mentioned for the first time in Chinese sources about the year 60 B.C. The inhabitants were Tokhars, whose language was western, Aryan. The Chinese sources call them Yüeh-chih. The town was founded by the Sogdians. These people were Buddhists and had come into contact with Buddhism partly via Sogdiana, partly direct from India. — Their art was more Persian than Indian, contrary to the case in Khotan. Their script



Fig. 13 a-b. 1/1. (314).



Fig. 14. 1/1. (315).



Fig. 15. 1/1. (366).



Fig. 16. 1/2. (367).



Fig. 17. 2/3. (368).



Fig. 18. 4/5. (312).

was influenced by the Semitic. Turfan adopted Christianity in the Manichean form in the eighth century, when the Turkish Uigurs ruled the town and also adopted Christianity. The town became Kirghiz in A.D 843.

Turfan is famous for the large discoveries of archives and temple relics of Manichean origin. The number of small finds is insignificant in comparison with Khotan. There are large cemeteries not far from Turfan, e.g. Astana.

We will now pass on to a description of the archaeological objects from Eastern Turkestan that form the Mannerheim collection. Later these materials will give us some possibility of forming historical theories and conclusions especially concerning connections with Northern Eurasia.

II. CATALOGUE.

The Mannerheim archaeological collection from Eastern Turkestan does not contain any implements, tools or weapons, such as are largely known elsewhere, e.g. from Turfan and Lou-lan. It consists in primo loco of small objects, figurines of terracotta and stucco, cast in moulds of stucco belonging to mural decorations, ossuaries and vases; some of the small other terracotta objects are independent articles, toys, ornaments, amulets; there are also some gems of semi-precious stones; further coins and stamps.

Many of the larger terracotta objects repose as applications on architectural work of a sacral nature. Buddhistic culture created public sacred edifices of various kinds, chiefly stupas or topes (= royal tombs and reliquaries) of different sizes, even of miniature size; further viharas or monasteries and walls and fences round shrines; private architecture was of minor importance. In Central Asia unbaked clay bricks and wooden poles were used principally as building materials. The walls of public sacred edifices were decorated, often both inside and outside, with cast figures in relief. In India already, where Buddhist art originated, art consisted principally of applications and reliefs in half or 3/4 relief and this applies equally to Eastern Turkestan.

Among the larger terracotta fragments from Khotan there are also entirely plastic human figures, but they too are seldom quite independent. The statuettes generally had a halo round their heads, when they represented Buddha, bodhisatvas etc., and therefore look like figures in a series intended to be seen only from one side. And as they were cast in forms, they are consequently rather stereotyped. There are exceptions, of course, works of high quality (e.g. from Rawak), but the great majority represent massproduction. When they were placed irregularly along the walls — there was no »law» in existence — the monotony was reduced to some extent.

The terracottas of the Mannerheim collection are reproduced below in the form of plates. They are arranged in groups and their description is on the same principle with a few exceptions.

A. Larger heads of terracotta or stucco.

1. Human face mask, hollow at the back, made of pressed clay or earth mixed with gypsum, 9—10 mm thick. The face was smeared over later with a thin layer of slimy clay,



Fig. 19. About 1/1. (335).



Fig. 20. 1/1. (382).



Fig. 24. (377).



Fig. 21.
1/1. (344).



Fig. 22.
1/1. (345).



Fig. 23. 1/1. (346).



Fig. 24 A.

After MONTELL I, Pl. II.



Fig. 24 B. Khotan. Buddh. late hellenistic vase
with Bacchus figures. (After V. LE COQ).

but was not painted. Impressions of fingers are visible on the front of the face. This object is well made, fine workmanship; the face is not ugly. Present size 111, 79 mm. — Probably rested as a decoration on some reliquary or stupa, possibly on a wooden support. — From Yotkan, according to the catalogue, but this seems to me improbable. The style resembles the objects from »Myslyk» (see p. 12). Local, south-eastern Turkestan workmanship with Indian reminiscences. Scarcely later than A.D. 600 but may be older (A.D. 450). Long eyes with extended corners, short nose, clear-cut mouth with curved lips, eyebrows indicated, face plump. Differs clearly from the comparatively rough terracotta figures.

No. 311. From Yotkan. Fig. 1.

2. Human head (head of a monk?) of stucco or plaster of Paris, entirely plastic except the back of the head which is straight. The material is hard, brick-coloured; the face is covered by a thin, lighter layer of clay. The hair is represented in the shape of a skull-cap. Good, beautiful workmanship, but unfortunately the face is damaged. Was fixed to some wall-like surface: the wall of the stupa? Size 120, 75, 75 mm. Compare O. SIRÉN, *Indian and other influences in Chinese sculpture* Pl. X. 39, XII. 48. Stockholm 1938. About A.D. 500?

No. 365. From Myslyk. Fig. 2.

3. Animal's head (dog? lion?) of reddish baked stucco. Plastic, hollow, with powerful forehead, nose and ears and round, bulging eyes. The lower part of the head is broken off. Thick covering shell of lime mortar. (S. STEIN, *Innere. Asia*. Pl. IV, 08). The hair on the forehead seems to have been represented by application plates fixed on, which, as well as the pupil of one eye, have fallen off. Was probably fixed as an *enclavé*-piece on some protruding wooden support on a shrine. A hole through the forehead in a horizontal direction for a wooden nail or plug. Size 128, 124, 90 mm.

No. 347. Yotkan. Fig. 3.

Objects like the three described most likely decorated stupas and the walls of shrines. There are similar ones known, e.g. from Dandan Uiliq in the Taklamakan desert. There are several statues larger than life-size there, also from the Rawak stupa court. Those from Dandan Uiliq are, at any rate partly, later, of the T'ang period, while the Rawak stupa court is entirely of the Han period according to Sir AUREL STEIN's excavations. (*Anc. Khot.*, Pl. 81 sq.).

B. Appliqués plaques from architectural memorials.

4. Large, round terracotta plaque with circle of a lotus flower¹⁹ in relief on the front side, cast in a mould. The outer border of the front side is flat. The first circle there consists of 26 low convex »beads»; the calyx has 9 »petals»; 9 pistils surround the kernel. — The reverse is rather uneven and provided with tooth-stamp-like hollows in some places in order to be more easily affixable to an architectural support. 136, 25 mm. — No. 4803. 348 From Yotkan. Fig. 4.

5. Round, ornamental plaque with the face of Medusa (or a Gorgon). The brow is

¹⁹ The lotus flower symbolizes the birth of Buddha in the Buddhist religion. Cf. MONTELL II, p. 91.



Fig. 25. 2/3. (389).



Fig. 26. 1/2. (280).



Fig. 27. 1/1. (279).

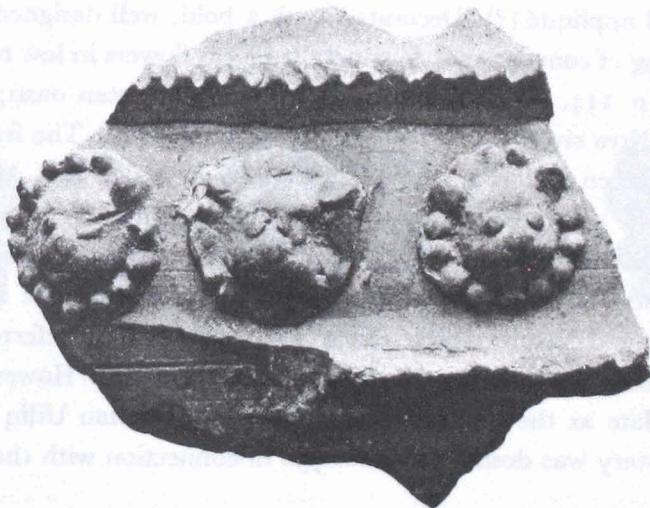


Fig. 28. 1/1. (396).

furrowed, the chin surrounded by a beard-like aureole; snub-nosed; open mouth with two large molars in the upper jaw and 4+4 front teeth. On the upper side of the reverse there is a half-moon shaped fracture: it was fastened to a support; the other half of the reverse is whole, smooth, without any sign of having been fixed (Cf. Fig. 5 A^b). 96, 30 mm. No. 4803. 370. From Myslyk. Fig. 5.

Plaques with Gorgonian face, either with or without a protruding tongue, are fairly numerous among Eastern Turkestan finds. The origin of the subject is undoubtedly western, Grecian, but it was adopted in purely Central and Eastern Asiatic surroundings. It occurs, cast in a mould, in Manchurian roof tiles (Mus. Hels. 4804. 17, Marianne REHNBERG's collection, Fig. 5 A) and on Chinese roof-tiles of the Han period. The latter display a strong resemblance to wooden reliefs. A mutual connection between them must be considered certain.^{20, 21}

Other terracotta applications that were perhaps sometimes, but not always employed architecturally are illustrated in Fig. 9—10. The shape is like a rosette, representing an open lotus calyx seen from above. — The object, Fig. 9. is small. It may have been fixed on to a vase or something similar. No. 4803. 383. From Myslyk. Fig. 10 a—b is of the same kind, but it is slightly concave, so that the object resembles a low bowl. Diam. 79 mm. Stand underneath. 4803. 384. Myslyk.

Figs. 6—8 are fragments of thin terracotta plaques that do not belong to each other, cast in moulds, like the preceding ones. Fig. 7—8 belonged to a larger disc with several outward curved half-moon shaped projections. In the Hedin collection in Stockholm there is a whole plaque, in which the »horns» are visible in a complete state. 4803. 378—380. From Myslyk.

Fig. 11 a—b are pieces of thin terracotta applications, broken off at both ends, but probably belonging to the same piece. The reverse is a rough »application surface», the obverse decorated in the shape of a garland, in low relief. Mural decoration? From some coffin? 4803. 386. From Myslyk.

Fig. 12 illustrates a fragment of a convex, probably round disc of stucco, full size, belonging to a wall appliqué (?) Decorated with a bold, well-designed and well executed ornament, consisting of conventional four-petalled lotus flowers in low relief. Sharp edge in relief. (See STEIN, p. 114. Pl. 41 from Moji, W of the Khotan oasis; see also a wooden sculpture from the Niya river, *ibid.* Pl. 68; MONTELL II, p. 91). — The fragment Fig. 12 is of the same kind of stucco material, thin, slightly convex. 4803. 385. Myslyk.

Very little can be said about these objects with certainty. The date of Fig. 6—8 and 11 a—b) might be as early as the Han period and they may have been placed on shrines. I have in mind analogies from the walls of the Rawak vihāra court illustrated in STEIN, *Anc. Khot.*, Pl. 83, 87 and described on p. 482. The date of the relic is referred to the Han period and its figures would seem to belong entirely to Gandharan art. However, these appliqués are still extant as late as the end of the 8th century in Dandan Uiliq in the Taklamakan desert. This monastery was destroyed about 790 in connection with the Tibetan conquests.

²⁰ A piece of a similar plaque from Myslyk was in the collection (catalogue 4803. 371), but has been lost.



Fig. 29. 1/1. (293).



Fig. 30. 1/1. (281).



Fig. 31. 1/1. (294).

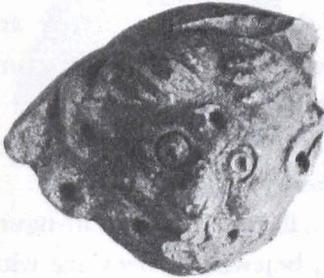


Fig. 32. 1/1. (390).



Fig. 33. 1/1. (283).



Fig. 34. 1/1. (393).



Fig. 35. 1/1. (284).



Fig. 36. 1/1. (282).



Fig. 37. 1/1. (292).

It is worth while mentioning in this connection that the terracottas of Turkestan could, perhaps, be divided into groups, earlier and later, Chinesified, Indian, local, but for the present this would be rather risky. Being cast in moulds, they bear the stamp of immobility. Individual features and specimens are rare.

C. Buddhist sacral ornamental discs.

Buddhist art mainly represents *Buddha* in an attitude of meditation, crosslegged, with his hands in a conventional position folded in his lap, in draped dress; his ears are depicted as being long-lobed, his hair is curly with a top-knot and is conventionalised. He usually sits on a lotus pedestal and against a double aureole of lotus leaves (Fig. 15—18). It is possible to distinguish different chronological and geographical groups. — Then *bodhisattvas* are represented: young men, often rich, who endeavour to resemble Buddha in their behaviour in order to be reborn in a future existence and become Buddhas owing to their »dharma», their virtue (Fig. 92). Female beings, Gandharvas (Fig. 13—14), are also reproduced (STEIN, *Anc. Khot.*, Pl. XLIII), as well as sirens or human birds (Fig. 93), dancers, snakes or Nagas etc. The Gandharvas are tutelary deities who sustain themselves on incense fumes. It is difficult to identify images of the genii of the Buddhist art: they are innumerable. Often, in Khotan too, the Gandharva figures may be of local manufacture (MONTELL I, p. 163), but the whole is founded on Indian tradition.

Figures — relief discs as in Fig. 13—16 — may have been placed either on architectural memorials or on urns and clay vessels, but are enumerated here in this connection.

13. Application of terracotta. Manufactured in mould. Represents a half-figure of a Gandharva seated on a lotus throne (missing in this case), jewelled; necklace with pendants. Treble aureole. Forearms raised, holding heavy garland. — The back presents a flat surface, but in this grooves have been incised in order to make it adhere better to the wall^(21, 22) (Fig. 13 b). The object may, however, have been fixed on to the neck of a large vessel (see MONTELL I, Pl. V. 3.). Height 77 mm. 4803. 314. Yotkan.

14. Ditto. Without aureole. Good plastic execution. Head slightly crooked. The hair is dressed loosely on the top of the head in »the fashion of to-day». The face wears a gentle expression. — A heavy necklace surrounds the neck and another hangs on the breast. — The plaque was on the neck of a vessel. A piece of the material adheres to the back of the figure. Height 57 mm. 4803. 315. Yotkan. Fig. 14.

15. Round terracotta application, partly fragmentary. In the middle a seated Buddha with dressed hair, long ears, necklace; stereotyped robe in folds, both shoulders covered. Treble aureole: the outermost a lotus rosette, the middle one a ray-like striated disc, the third smooth, with a line marking the outline. Diam. 90 mm. Found, like the two next, in Myslyk. 4803. 366. Fig. 15.

16. A similar one, possibly cast in the same mould. 4803. 367. Fig. 16.

17. Part of a ditto, torso. » » » » » 4803. 368. Fig. 17.

²¹ Cf. A. SALMONY, *Tuiles à figures de l'époque des Han. Cahiers d'art* 5, p. 241 sq. — Cf. Cf. *ESA* 11, p. 101, 102. — W. P. YETTS, *Notes on Chinese Roof-tiles. Transactions of the Oriental Ceramic Society* 1927/28.



Fig. 38. 1/1. (395).



Fig. 39. 1/1. (326)



Fig. 40. 2/3. (394).



Fig. 41. 1/1. (327).

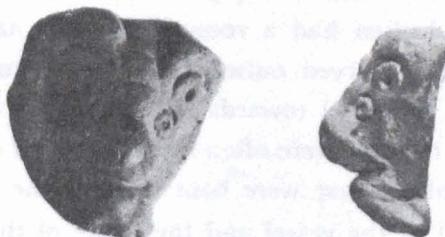


Fig. 43. 8/7 and 1/1. (339).



Fig. 42. 7/6 and 1/1. (329).



There was another piece of an aureole in the collection (4803. 387), but it has been lost.

18. Seated Buddha, relief carving in soap stone. The head and one knee are broken off. The legs are not crossed, but are covered by the robe. The lower edge is polished smooth, provided with a small hole. Was affixed to a bar. Height about 50 mm. 4803. 312. (Fig. 18). From Yotkan.²³

D. Applications from clay vases and ossuaries. Fragments of vessels.

A very large part of the small terracottas in the Mannerheim collection undoubtedly belonged to clay pots, decorative vessels and ossuaries. Very few whole vessels are found in Yotkan and rougher vessels for practical purposes, cooking vessels and containers were, perhaps, mostly made of metal. The terracotta fragments that are depicted below were probably affixed to vessels for holding wine, decorative vases etc., that were not particularly large. Their shape can be established either by means of miniature vessels (Fig. 21, 22) or by means of some large fragments (Fig. 23, 24, 24 A-B). Thus we have to deal with débris, though they enable us to form a very good impression of the shape and ornamentation of the vessels.

The vessel often had a rounded bowl, a narrow neck, the opening of which was frequently slightly curved outwards, a groove and usually three handles starting from the shoulders of the bowl towards the opening of the neck and bending over the rim of the vessel. The handles were often in the shape of conventionalised animals, heads of griffins, lions or monkeys that were bent towards the mouth of the vessel (Fig. 44—52).

The bowl of the vessel and the lower of the neck were often decorated either with discs in relief or with incised lines and dots (cf. Fig. 24 A, 24 B), frequently carelessly made and of a simple character with the exception of the vertical fluting on the bowl (Fig. 20). The figures in relief consisted either of parallel ridges on both sides of the broadest part of the bowl, the ridges often having dentated cross-lines or incisions (Fig. 27) or of appliqués plaques. They were moulded and made as separate pieces and stuck on to the jar before it was fired. They represent the faces of animals and human beings mostly, though plant subjects, for instance, are not unknown; there are none of the latter, however, in Mannerheim's collection. — The neck was most frequently decorated by fairly large discs of Gandharvas (see Fig. 13—14), and the upper part of the bowl with round masks. There are some cases, in which the number of these medallions is large (Fig. 27, 28), but it was often limited to three: the medallion was attached immediately below the lower junctures of the handles, i.e. as the beginning of a capital or console. There are several variants.

The illustrations chiefly represent terracotta appliqués from vessels. As already mentioned, some of the medallions may have been affixed to architectural memorials (see p. 10) and it is not impossible, perhaps, that a few of them decorated astodans or ossuaries as is the case in Sogdiana, though there the burial urns may possibly represent Mazdaism or some other western, and not Indian, form of religion.

²² As, e.g., HOERNLE, Pl. 8.1; 9.7, 9, 10, 20, 22, 23.

²³ Reliefs in slate stone formed part of the decoration of miniature shrines or stupas. — This material is commonly used in the sculptures of the Gandharan art. STEIN, *Anc. Khot.*, p. 209, Pl. 48.



Fig. 44. 1/1. (323).



Fig. 45. 1/1. (402).



Fig. 46. 1/1. (322).



Fig. 47. 1/1. (403).



Fig. 48. 2/3. (332).



Fig. 49. 1/1. (324).

D. 1. *Pieces of vessels. Miniature vessels.*

19. Fragment of a jar of hard, red clay, with low relief rings and knob. From Yotkan. 4803. 385. Fig. 19. — S. STEIN, *Innerm. Asia*, Pl. III.

20. Fragment of a jar of thin, red material, beautiful shape with fluting (impressed) and cross-bands with twined bands, with a space between. For a reconstruction of a similar vessel see, Fig. 24 A, and MONTELL I, Pl. III. 2—3. 4803. 382. From Myslyk. Fig. 20.

21. Miniature ewer, 29 mm high. Bulging, obliquely grooved bowl, short lip, stand. Ear broken off. 4803. 344. From Yotkan. Fig. 21. Cf. a larger vase from Yotkan illustrated in STEIN, Pl. 43. Y. 0027 a.

22. Miniature vase. Oval cross-section of bowl. Stand and one ear broken off. About 24 mm. 4803. 345. From Yotkan. Fig. 22.

23. Miniature vessel with a piece of the mould adhering to it. The handle and mouth are broken. 57,36 mm. 4803.346. From Yotkan. Fig. 23. — Nos. 21—23 used as toys?

24. Clay bottle with stand, unornamented. The handle is missing. A bowl for some kind of ointment? 65, 60 mm. 4803. 377. From Myslyk. Fig. 24. — A similar jar in the collection, cat. 4803. 373, is now missing.

D. 2. *Terracotta applications.*

25. Fragment of a jar with appliqué face of a satyr (pointed ears) or human being. Comparatively thin material, about 3—4 mm thick, pink colour. The jar is ornamented with parallel incised lines and dots and reliefs of figures. The mask previously manufactured in a mould and stuck on the vessel. The face rather rough, hair parted. The head was placed against the lower edge of the handle of the jar. Cf. Fig. 24 A. 4803. 389. Islamabad, Yurung-Qash. Fig. 25.

26. Fragment of jar of material, about 4 mm thick, of pink colour like the previous one. The wall of the vessel is thinnest at the top. Incised, carelessly made parallel horizontal lines and a row of double circles with an indented dot in the middle. Vertical lines about 12 mm long between the transverse lines and the row with impressions of rings. — Application of clay in the form of a human face of the same kind as No. 25. The eyes made of two small clay rings, pressed on the surface. Two rosette-shaped applications under the chin: ear-rings? The mask is placed below the ear of the jar, against the lower edge of which the upper part of the head rests. This ear was about 15 mm wide and slightly faceted. No. 4803. 280. FO. Yotkan. Fig. 26.

27. Fragment of jar of pink material about 9 mm thick, ornamented with tooth-shaped, transversely striated ridges, about 6 mm high. Between the ridges two applications in the form of stereotyped human (satyr?) faces. Pear-shaped ears with pendant ornaments of rings. Hair dressed in the usual manner. Deep furrow in the middle of the brow with small cavity on either side. Corners of the mouth drawn, lips tightly closed in the middle. 4803. 279. Yotkan. Fig. 27.

28. Fragment of jar of the same thickness, shape and colour as the previous one. Inner side damaged, splintered. The appliqué figures represent round heads of lions with curly hair. 4803. 396. Fig. 28.



Fig. 50. 1/1. (330).



Fig. 51. 1/1. (331).



Fig. 52. 1/1. (328).



Fig. 29—37. Applications, medallion-like, from vessels and urns of the same kind as on Figs. 21—28. Human types, but perhaps never meant to represent a human face? Varying expressions: compare furrowed forehead, large mouth, rounded eyes, distance between the eyes, satyr's ears pointed towards the top. All made by the dozen or common goods except perhaps Fig. 35.

- 29. Satyr's head with pointed ears. 4803. 293. Yotkan
- 30. Human head with merry expression. 4803. 281. »
- 31. Human head. 4803. 294. Yotkan.
- 32. »Pug-nose«. Impressed, ring-shaped, almost »unplastic« eyes. 4803. 390. Islamabad, Yurung-Qash.
- 33. Human head with closed mouth. 4803. 283. Yotkan.
- 34. Snub-nosed face. Large mouth. Impressed eyes. 4803. 393. Islamabad, Yurung-Qash.
- 35. Wrinkled brow, half-open mouth, upright hair without parting. Old man? 4803. 284. Yotkan.
- 36. Roughly cast. Unique of its kind. Head of a Gorgon? 4803. 282. Yotkan.
- 37. Like No. 34, but still rougher. Yotkan. 4803. 292.

Fig. 38—41. Applications, medallion-like, arched, in the form of lions' faces, front view. They were employed in the same way as the masks of human faces. Projecting muzzle, strongly arched forehead, conventional curling of the »hair«.

- 38. Fastened on to a well baked, red bit of material. 57, 56 mm. 4803. 395. Islamabad.
- 39. Stamped-in eyes, hair below the ears ring-like, not carried out plastically. 4803. 326. Yotkan.
- 40. Hair on the brow treated similarly to the human face masks. The hair of the »moustache« represented by dots. 4803. 394. Islamabad.
- 41. Conventional lion's head. 4803. 327. Yotkan.

42—43. Applications, animals' heads in profile, carried out plastically, of a similar kind to the former, but not representing lions.

42 a—b. Face-mask of a wolf (?), with half-open mouth, prognathic, rather pointed muzzle, dot on the brow, pointed ears, thick eyebrows. The head is surrounded, except between the ears, by a conventional wreath of hair. The back is hollow in the form of a funnel. There is a hole through the mouth. 4803. 329. Yotkan.

43 a—b. Animal mask application (lion? dog?) with profile. Raised eyebrows, low forehead, impressed eyes, muzzle not pointed. Round the face the wreath of hair is indicated in the same way as in the previous one. 4803. 339. Yotkan. 8/7 and 1/1.

D. 3. *Pieces of handles of vases or urns, of gryphon, ape and lion shape.*

- 44. Head of a gryphon, plastic, cast in two halves lengthwise. Beautiful. The horn built up in the shape of the horn of a unicorn. — 4803. 323. Yotkan. Fig. 44.
- 45. Ditto, rougher modelling. The »horn« broken off. — 4803. 402. Islamabad. Fig. 45.
- 46. Ditto, like No. 1 — 4803. 322. Yotkan. Fig. 46.



Fig. 53. 1/1. (392).



Fig. 54. 1/1. (291).

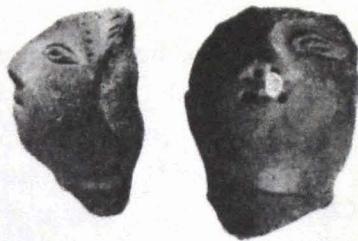


Fig. 55. 1/1. (287).



Fig. 56. 1/1. (285).



Fig. 57. 1/1. (286).



Fig. 58. 1/1. (288).



Fig. 59. 1/1. (391).



Fig. 60. 1/1. (321).



Fig. 61. 1/1. (289).



47. Ditto, best preserved. Short wing with shield folded on the back; mane, tail. Loins provided with voluted ornaments. Hind foot broken off. Cast in two longitudinal halves. Brown terracotta. — 4803. 403. Islamabad. $\frac{2}{3}$ natural size. Fig. 47.

48. Lion's head with the mane covering the neck, half-open mouth. Face stereotyped. Common work. — 4803. 332. Yotkan. Fig. 48.

49. Head of a gryphon, beautiful. Wing shield the same on both sides. Forehead and neck polished. Beautiful grey terracotta. — 4803. 324. Yotkan. Fig. 49.

50. Handle with a monkey's head, without any indication of hair. — 4803. 330. Yotkan. Fig. 50.

51. Handle with a lion's head. — 4803. 331. From Yotkan. Fig. 51.

52. Figure of a lion, plastic. Impressed half-moons represent the curly mane. Hairy muzzle. Cast in two moulds and fastened together. The technique is clearly visible on the broken surface. 93, 51 mm. 4803.-328. Yotkan.²⁴ Fig. 52 a—b.

E. Full figures.

E. 1. Heads worked in the round or $\frac{3}{4}$.

Plastic or semi-plastic reproductions of human heads, sometimes provided with a short torso. The workmanship varies: good specimens and caricatures, badly and well baked. The expression is generally stereotyped and lifeless. As a rule these figures are made in two halves, the front and back portions being cast separately in distinct moulds and afterwards joined together before baking, as HOERNLE was the first to establish. Some of them are, perhaps, applications from vessels, but some are undoubtedly independent figures, though their function cannot always be decided: toys, charms, joking and humorous figures and so forth.

These heads in Mannerheim's collection are mostly cheap stuff. In Sogdia and India, however there are small figures of a far finer kind, imitations of Grecian types: Apollo, Alexander the Great, Bacchus, sirens etc. — Higher-class plastic human faces sometimes have a hollow in the forehead. The artist often put a bead or precious stone in this. It was the so-called *urna*, the sign of intelligence and virtue. The present collection possesses no such heads of statues.

The following is a list of the specimens of this kind contained in the Mannerheim collection.

53. Semi-plastic figure, with plastic face and straight occiput, consequently hemispheric in cross-section. Dots in the chin, forehead and at the corners of the mouth. Eyebrows made by incised dots. »Hair» (?) in the form of a low crest, inclined forwards, with slanting lines. — 4803. 392. From Islamabad. Fig. 53.

54. Semi-plastic male head with straight occiput. Carelessly sketched. Incised wrinkles in the forehead; moustache, chin-beard; made in casting. — 4803. 291. From Yotkan. Fig. 54.

²⁴ This object was also a handle. Analogies to it are depicted, e.g., by KIESERITZKY (Fig. 11) and HOERNLE (Pl. VIII. 8. 10). The fore-paws rested against the neck of the vessel and the hind legs of the straight, tall, stylised body against the bowl itself.



Fig. 65. 1/2. (400).

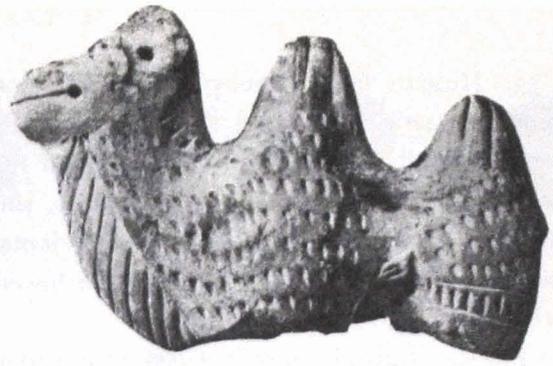


Fig. 62. 1/1. (334).



Fig. 66. 1/1. (401).

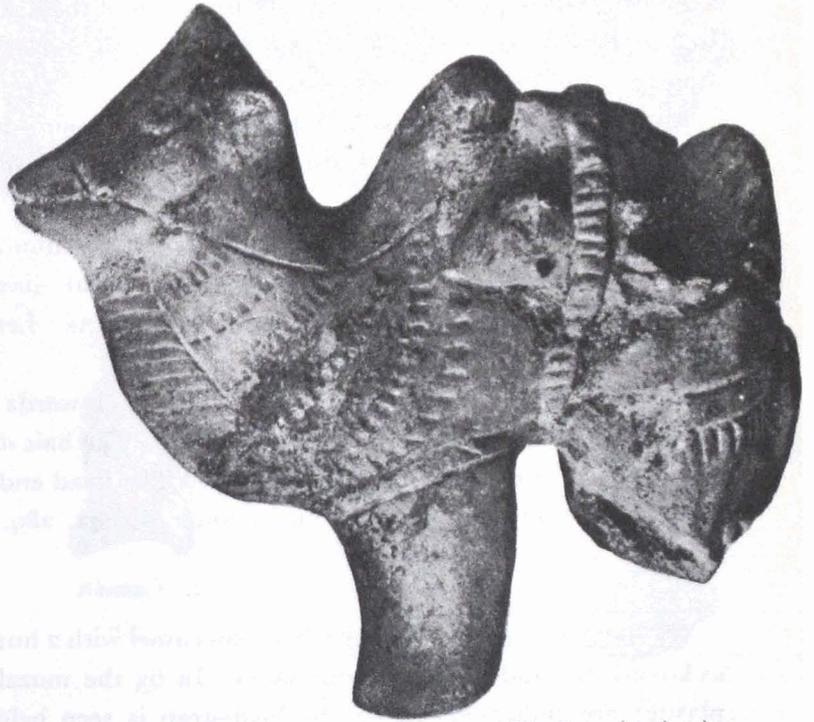


Fig. 63. 10/7. (335).



Fig. 64. 1/1. (333).



Fig. 67. 1/1. (336).



Fig. 68. 1/1. (337).

55. Human head, semi-plastic, with straight occiput. Round cheeks, snub-nosed. Eyebrows made by incised dots. — 4803. 287. From Yotkan. Fig. 55 a—b.

56. Female semi-plastic head. Rough lines on the back of the head (cf. Fig. 61). Large eyes, pointed oval, large, high nose, small mouth with dots at the corners. Parted hair with hanging ends. The ears are damaged. Above the brow a slanting unornamented crest (which coincides with the lower part of the handle). — 4803. 285. From Yotkan. Fig. 56.

57 a—b. Entirely plastic, fairly beautiful female head of bright material. Face as in No. 56. Thicker eyebrows, mouth put on, dots on brow, eyes and cheeks. The plait is taken from the nape of the neck up to the crown of the head. Cast in two moulds, face and back of head separately. The seam is clearly visible. Coiffure partly broken. (S. Fig. 19?) — 4803. 286. Yotkan. Pl. 57 a—b.

58. Male face-mask, hollow at back. Material 5—6 mm thick. Moustache. Chin indicated below, also ears. A «turban» on the head, slightly damaged. — 4803. 288. Fig. 58 a—b.

59. Semi-plastic head. Cf. fig. 56. Length 42 mm. 4803. 391. Islamabad. Fig. 59.

60. Bust-head, grotesque, and torso with oval diameter. Pointed ears, impressed eyes, no forehead. Nostrils and mouth incised dots. Length 34 mm. 4803. 321. Yotkan Fig. 60.

61 a—b. Torso of a man, plastic, bust flat towards the back. The hand describes a gesture as if blowing a kiss. Moustache; ears. The hair of the occiput depicted by vertical lines. Parted in front, with hanging points. The head ends at the bottom in a round plug fitted to the body as a tubular projection. — 4803. 289. Yotkan. Fig. 61 a—b.

E. 2. *Camels.*

62—64. Plastic figurines of a Bactrian camel with 2 humps. 64 without beard, but with neck-cord, 62 and 63 laden with sacks. In 63 the muzzle-strap (incised) and load-strap (plastic) are indicated, in 62 the load-strap is seen below the belly, but the load itself has disappeared. Once it represented skins full of water. All three are clearly cast in double moulds crosswise and 64 is partly hollow. Short tail. — 4803. 333—335. Fig. 62—64.

Nos. 65, 66. Ditto, No. 65 with well preserved saddle, No. 66 with one hump left; no indication of hair on the body. — 4803. 400, 401. Fig. 65, 66.

67. *Bronze* miniature figurine of a camel with two humps. No muscles. Cast. HOERNLE illustrates a similar one that was a pendant (with a hole). Hoernle Pl. 12. 23, 20, 6 mm. — 4803. 336. Yotkan. Fig. 67.

68. Miniature figure of a camel (with one hump?) of light potstone (steatite), fragmentary.²⁵ 25, 20, 8 mm. — 4803. 337. Yotkan. Fig. 68.

Can all these figurines be toys?

²⁵ A complete analogy, broken in the same way, of soft white stone is reproduced by HOERNLE Pl. 13. 27. Is this a case of complete figures? HOERNLE considers that the completeness is doubtful. *Op. cit.*, p. 54.



Fig. 69. 1/1.
(308).



Fig. 70. 1/1.
(297).



Fig. 71. 1/1.
(302).



Fig. 72. 1/1.
(301).



Fig. 73. 1/1.
(296).



Fig. 74. 1/1.
(303).



Fig. 75. 5/6. (299).



Fig. 76. 1/1. (295).



Fig. 77. 1/1. (320).



Fig. 78. 1/1. (307).



Fig. 82. 1/1.
(398).



Fig. 83. 5/4.
(306).



Fig. 85. 2/3.
(299).



Fig. 84. 11/17.
(300).



Fig. 86. 9/13.
(298).



Fig. 79. 10/9. (290).



Fig. 80. 1/1. (397).



Fig. 81. 3/2. (340).

E 3. *Monkeys*. Figs. 69—80, 82—86.

Among the small finds from Khotan figures of monkeys, chiefly of clay, occupy a very prominent position. They are naturalistic figurines, plastic, mostly independently modelled, not manufactured in moulds, showing evidence of good skill and powers of observation. As a rule they are of inconsiderable size, often veritable miniatures, sometimes pierced and possibly used as amulets. Some of them look like caricatures, when they are depicted as engaged in human occupations. The faces may even be something between man and monkey. HOERNLE writes, p. 48—49:

Monkeys »are represented in a great variety of postures and acts — —, such as embracing and kissing, sitting or swinging on a bough and eating; sitting, kneeling, or squatting and playing on some musical instrument; sitting meditatively, sitting and holding a stick or other object; wearing a short tunic. — — Often, especially when playing musical instruments, they are represented ithyphallic. The body is often shown covered with hair, indicated by incised dots or minute strokes, but quite as often perfectly hairless.» They are often depicted naked, sometimes with a loin cloth.

The head is depicted either in a careful naturalism or a rough, but effective grotesque. The large proportion of obscene figures proves that licentiousness used to thrive in Khotan.

As regards the workmanship and ornamentation, STEIN's description of his figure, p. 212, Y. 0009 i may be quoted: »The hair — — is expressed by a few strokes of the sharp point or blade of a modelling tool. — — The eyes are apparently put in with a stamp. The mouth is cut with a thin instrument with a hole dug at each corner giving a humorous expression.» With regard to further remarks about the monkeys, see STEIN, p. 208.

69. Figure of a monkey holding a loaf or fruit in its hands. No feet. Stand polished, back without covering of hair. — 4803. 308. Fig. 69.

70. Small monkey figurine, head and neck, with few anatomical details. 29 mm. — 4803. 297. Fig. 70.

71. Ditto, lower part of body broken off. Hair on body indicated. Playing a cithern? 4803. 302. Fig. 71.

72. Miniature figure of a monkey in sitting posture, legs broken off. Loin cloth. Arms bent towards breast, holding a bun or bottle broken off at the top. 25 mm. Hair on body not indicated. — 4803. 301. Fig. 72.

73. Head and neck of a monkey. — 4803. 296. Fig. 73.

74. Ditto, like fig. 72. Head and legs broken off, also left arm. Right hand holding a round object. Sack? Musical instrument? — 4803. 303. Fig. 74.

75. Head of a monkey, large, carried out realistically. Hair on the head indicated. Back of head bald. 38, 36, 28 mm. — 4803. 299. 5/6. Fig. 75.

76. Monkey squatting on its knees, legs bent backwards. Loin cloth. Body round, head flattened at the back. — 4803. 295. Fig. 76.

77. Torso of a monkey (?); no legs. One arm bent towards back of neck, the other bent forward and upward. No fingers. Of the face the eyes and one ear are visible; owl-like face; pointed cap. Very roughly made. 44 mm. — 4803. 320. Fig. 77.



Fig. 89. 1/1. (341).



Fig. 90. 1/1. (338).



Fig. 91. 1/1. (404).



Fig. 87. 1/1. (372).



Fig. 88. 1/1. (319).



Fig. 92. 1/1. (313).



Fig. 93. 2/1 (325).

78. Monkey climbing a tree. Tree-trunk broken off at top and bottom. One hind leg missing. Curious figure. 37 mm. — 4803. 307. Fig. 78.

79. Terracotta figure representing a child or monkey lying in a low cradle, wrapped in swaddling clothes. The cradle has a high perpendicular head with rounded top. Length about 60 mm. — 4803. 290. Yotkan. See MONTELL I, Pl. 16. 5. — Fig. 79.

80. Head of a monkey, comparatively large, semi-plastic, hollow at the back. Round, impressed eyes, round muzzle. Hairiness indicated by a line of shallow dots round the muzzle. Appliqué, half-striated neckband. — 4803. 397.²⁶ Islamabad. Fig. 80.

81.²⁷

82. Two monkeys or human beings in an amorous embrace. Small. The bodies hairless. — 4803. 398. Fig. 82.

83. A similar symplegma reproduction of two monkeys provided with tails. Heads broken off. Hairiness of the bodies indicated by dots. 4803. 306. Fig. 83.

84. Phallus surrounded by the legs of a hairy monkey. A small monkey had been seated astride his phallus, but the upper part of the body is broken off. Naturalistic type and cleverly executed. The phallus runs backwards, forms a ring and brings its head straight up between the monkey's knees, possibly as high as its waist. The legs of the figure that have been preserved, issue downwards, and, encircling the upper curve of the phallus, bring their feet together in front. Cf. STEIN, *Anc. Khot.* p. 212. Y. 009 q. 1. — 4808. 343. Yotkan.

Not reproduced here.

85. Monkey, kneeling, the body hairless. Its right hand holds the broken phallus. The left hand is folded against the breast. Length 17 mm. 4803. 300. Fig. 84.

86. Monkey, kneeling, the body hairless. The left hand *veretrum tenens*, the right hand folded against the breast. — 4803. 299. Yotkan. Fig. 85.

87. Kneeling monkey with a bowl (?) in his hands (begging for alms?). Body hairy. Legs and phallus damaged. — 4803. 298. Fig. 86.

In addition to the figures reproduced, the Mannerheim collection contained some similar figures and others which were lost subsequently and are not enumerated above. They are:

88. Monkey, hunchbacked, arms and $\frac{3}{4}$ of legs missing. Possibly phallic. Length 19 mm. Missing. — 4803. 304.

89. Miniature figure. Two monkeys kissing and embracing, like fig. 83. Length 15 mm. Missing. — 4803. 305.

90. Monkey. Hands crossed over upper part of stomach. Kneeling. Loin cloth. 22 mm. Missing. — 4803. 309.

91. Ditto, like 305. Of pot-stone. Missing. 11 mm. Unique? Faked? 4803. 310.

92. Male figure, ithyphallic, onanising. Of pot-stone. 31 mm. Faked? Missing. — 4803. 316.

²⁶ In connection with the monkeys the handle, Fig. 50, should be recalled.

²⁷ For description of Fig. 81, see p. 36—38.

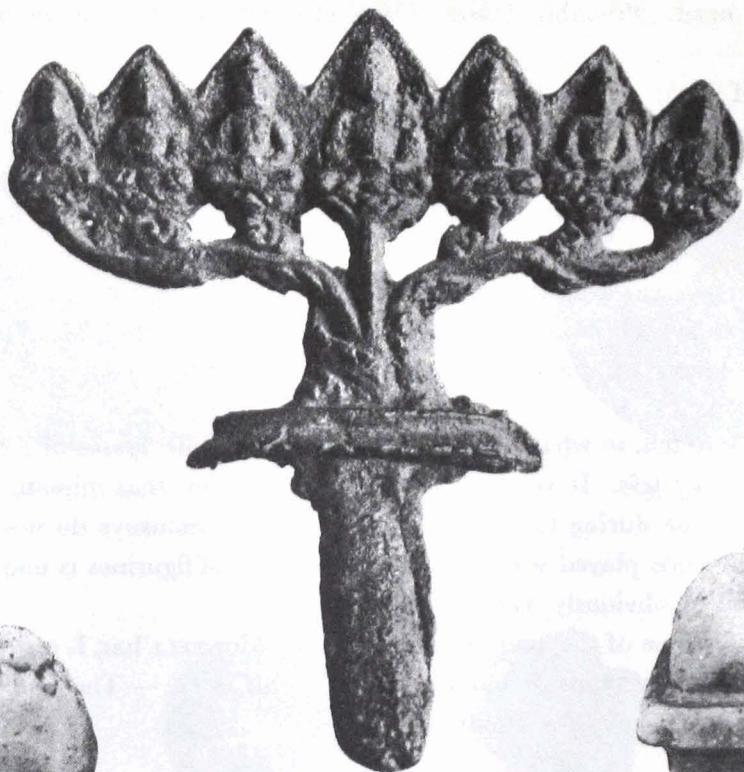


Fig. 94. 1/1 (318)



Fig. 95. 1/1. (374).

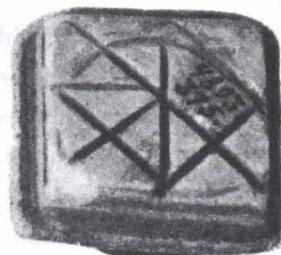
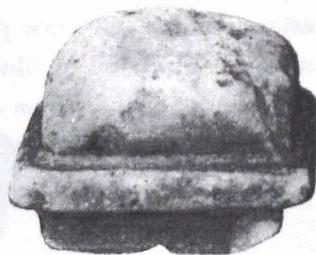


Fig. 96. 1/1. (375).



Fig. 97. 1/1 . (435).

93. Human head. Probably faked. Of pot-stone. Length 22 mm. Missing. — 4803. 317.
94. Figure of bird, made of bone. Missing. — 4803. 342. Cf. Fig. 89.
- 95—100. Stone beads, fragments etc. Missing. From Yotkan. 4803. 354—359
101. Metal fitting, heart-shaped rise in the middle. Missing. — 4803. 363.
102. Monkey, squatting on its knees. Hairy. One arm broken off. Length 17 mm. Missing. — 4803. 369.
103. Jar, of clay, ear knocked off. Missing. Myslyk. — 4803. 373.
104. Piece of an aureole of clay from a figure of Buddha. Missing. Myslyk. — 4803. 387
105. 5 small pieces of glass. Missing. Myslyk. — 4803. 388.

It is impossible to tell, to what historic period of Yotkan the figures of monkeys belong. Probably they were ageless. It is worth mentioning, however, that miniature figures were very common in China during the T'ang period. Besides, monkeys do not exist in Turkestan. Indian influence played some part, but this group of figurines is undoubtedly local and the objects were obviously very popular.

I mentioned that some of the figurines were amulets. MONTELL has, I, p. 190—192, a very likely explanation of the ithyphallic monkey figures in his work. — The figures of monkeys, no doubt, include some toys for children.

E 4. *Various other entirely plastic figures.*

The objects reproduced and described above are to a great extent of terracotta and stucco. This material predominated in Yotkan, but was by no means the only one. The illustrations and letterpress have shown us that there are objects of the same kind as the pottery, though comparatively seldom, in metal: bronze, lead, tin; of alabaster, bone (a bird) and stearite. The figures, Fig. 18 (Buddha) and 67, 68, referred to above, are of this kind. Others are reproduced on Fig. 87—93 (on which some isolated terracotta figurines are also illustrated).

106. Weight (?) of bronze in the form of an argali figure with a foot-plate. Reminiscent of Ordos bronzes. 40, 28, 8 mm. Weight 45 gr. — 4803. 372. Myslyk. Fig. 87.

107. Leaden figure, one-sided, cast. Represents a horseman, full-face, on horseback. The horse looks as if it had an ornament on its forehead and a beard. For analogies, see *Coll. Tovostine*, Pl. IX. 10. Height 34 mm. — 4803. 319. Fig. 88.

108. Figure of bird, of bone, small, entirely plastic, fragmentary, crest and tail broken off. Greatest present length 29 mm. 4803. 341. Yotkan. Fig. 89. — The collection formerly contained another, full-length figure of a bird of bone (342). Lost.

109. Bracelet of bronze, broken off, pseudo-wound, ending in an animal's head. Probably descended from ancient Iran bracelets with animals' heads of the latter half of the first millennium B.C., but surviving down to the present day in Tibet. — 4803. 434. Aq-sepil. Fig. 126.

110. A bird with crest, both wings and conventionalised tail. Rather like a flying fish, but figures of flying fish are extremely unlikely from the desert land of Asia. Probably



Fig. 98. 1/1. (349).



Fig. 99. 1/1. (427).



Fig. 100. 1/1. (350).



Fig. 101. 1/1. (362).



Fig. 102. 1/1. (361).



Fig. 103. 1/1. (351).



Fig. 104. 1/1. (429).



Fig. 105. 1/1. (428).



Fig. 106. 1/1. (416).



Fig. 107. 1/1. (418).



Fig. 108. 1/1. (414).



Fig. 109. 1/1. (436).



Fig. 110. 1/1. (417).



Fig. 111. 1/1. (419).

had a small foot-plate to make it stand upright. HOERNLE, p. 44, assumes that these figures may have served to adorn the top of a plain handle or possibly they may have formed the handles of lids. Length 77 mm. 4803. 340. Yotkan. According to STEIN, *Anc. Khot.*, p. 212. Pl. 46: 009 n, at any rate some of the Yotkan figures of birds represent the *hoopoe*: they have a large, erect crest. Fig. 81.

111. Argali figure of terracotta, plastic, but flat; beautiful specimen, well carried out. — 4803. 338. Fig. 90.

112. Miniature drum or kaplas, like an hour-glass, of terracotta, in the shape of a magic drum of a lamaistic monk, consisting of the two halves of a skull. Such drums are used by lamaistic priests, masked, in their magic dances.²⁸ — 4803. 404. From Islamabad. Fig. 91.

113. Bodhisatva torso of steatite, flat. Reverse untouched. Wearing a striated neck-band in relief, from which a four-cornered ornament, reproduced in relief, hangs. — Rich clothing. The crossed bands on the breast go over both shoulders. Present length 66 mm. — 4803. 312. Fig. 92.

114. Small figure of a siren of pot-stone, very beautiful workmanship. Long curly hair. Melon-shaped style of hair (? HOERNLE). Wings. Both sides alike. Face and breast of the bird curved, in profile. Two feet apart. 40, 40, 22 mm. — The design is occidental, Grecian. In North-Western India the representation of sirens influenced the origin of the mythical Garuda birds: they destroy the Naga snakes and themselves are food for the gods. — 4803. 325. Fig. 93.

F. Various metal (and stone) objects.

115. Bronze figure representing the seven Buddhas or Buddha and six Bodhisatvas sitting on the branches of a tree or lotus stalks. All are surrounded by an egg-shaped halo and are carelessly made: common workmanship. Stalk (not socket) for fastening to a support. The whole must have formed the top ornament of some other object. Cf. KIESERITZKY, p. 185, fig. 25. 4803. 318. Yotkan. Fig. 94.

116. Small bowl (bowl of a spoon?) of bronze, decorated inside and outside in vegetal style. The broken surface on the outer edge seems to indicate that the object had a handle. A spoon? 4803. 435. Aq-sepil. Fig. 97 a—b.

117. Crescent-shaped ornament, with shank broken off in the middle of the back. Sunken design. Cast. — 4803. 427. Yangi, S of Khotan. Fig. 99. — There is a similar specimen, No. 118, from Hangiya, with bits of bronze hanging from the points and middle projection of the «crescent». Probably very late.

118. Bronze plate, rosette-shaped, with sunken ring-like ornamentation in the 6 sections of the rosette. Stalk at the back. — 4803. 361. Yotkan. Fig. 102.

119. Two tin buttons or ornaments, low conical, simply decorated. Late. — 4803. 351. Yotkan. Fig. 103.

²⁸ Lamaism adopted popular animism and magic. It is very hierarchic and has existed since the 7th century, especially in Tibet.



Fig. 112 a-b.

Fig. 113 a-b.

Fig. 114 a-b.

Fig. 115 a-b. 1/1. 2/1



Fig. 116 a-b. 1/1. 2/1.

Fig. 117 a-b. 1/1. 2/1.

Fig. 118 a-b. 1/1. 2/1.

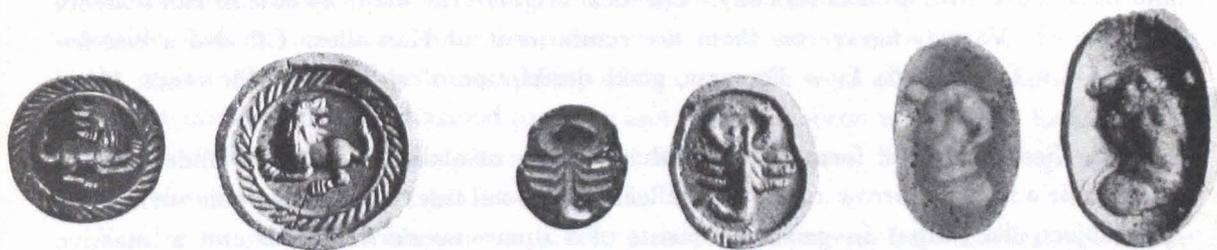


Fig. 119 a-b. 1/1. 2/1.

Fig. 120 a-b. 1/1. 2/1.

Fig. 121 a-b. 1/1. 2/1.



Fig. 122. 2/1.



Fig. 123. 2/1.



Fig. 124. 2/1.



Fig. 125 2/1.



Fig. 126. 1/1. (434).



Fig. 127. 1/1.



Fig. 128. 1/1. (409).



Fig. 129. 1/1. (406).

120. Two slightly convex thin bronze plates, with a hole in the middle, decorated with an even-armed cross in low relief. Late. — 4803. 418. Islamabad. Fig. 107.

121. Fittings for strap-end, fragmentary, »Carolingian». Rather coarse. T'ang period? — 4803. 437. Keriya. Fig. 109.

122. Fitting, narrow, four-cornered with an incised trail. Shank on the lower side — 4803. 417. Islamabad. Fig. 110.

123. Ornamented narrow, thin stone plate, broken off at both ends. Cross-section: like a knife-blade. Design well incised. 4803. 419. Islamabad. Fig. 111.

G. Seals or signets.

Seals were common and necessary in the Khotan oasis, for the culture was literate and there are many documents, even Kharoshthi documents, to which seals of clay were affixed. Cf., e.g., STEIN, *Anc. Khot.*, Pl. 71, 72. There are seals made of wood and these were probably the commonest, but also of metal, alabaster and stone. These seals have never been exhaustively dealt with archaeologically. The local origin of the majority at least can scarcely be doubted. Various figures on them are reminiscent of Han tiles. Cf. also a wooden seal, v. LE COQ, Pl. 64 f. — For new, good description of signets, see MONTELL II, p. 88 sq.

124. Seal (?) in the form of a miniature »stupa» of alabaster. On the under side in the middle a narrow furrow running parallel to the broad sides across the whole surface. — The object, like stupas in general, consists of a square »understructure» and a massive »superstructure» in the shape of a bubble, crowned by a terrace (GRÜNWEDEL, p. 20). A screen rises above the terrace. The head of the cupola is as though it were tied, the line being decorated with incised hollows. 4803. 374. Myslyk. Fig. 95.

125. Ditto. The upper part arched, rounded rectangular, middle piece rectangular, rows on the lower side. See illustration. — 4803. 375. Myslyk. Fig. 96.

126. Bronze seal, rectangular, in the form of a plate. On the back in the middle a low plate-shaped shank, on the front four rectangular seals for stamping (in clay, cloth etc.). The stamps represent a winged lion (?), a running hare, a deer with huge antlers and an unknown figure with a clover-leaf in each corner. All Buddhistic symbols? — 4803. 349. Yotkan. Fig. 98.

127. Stone seal, slanting rectangular, pierced shank at back. Inscription? 4803. 350. Yotkan. Fig. 100.

128. Bronze seal, round, plate-shaped, rusty. The non-reproduced back has a plate-shaped shank in the middle. The sunken figure on the obverse is a deer. 4803. 362. Cf. MONTELL II, p. 91 and Pl. VI. 1. Yotkan. Fig. 101.

129. Bronze seal, octagonal, shank at back. On the obverse the figure of an elephant with a snake on either side above its back. Cf. MONTELL II, p. 91—92 and Pl. V, 12. — 4803. 429. Hangiya. Fig. 104.

130. Bronze seal, quadrangular, bearing engraved characters KHIX, perhaps Christian Nestorian cross, plate-shaped shank at back. Cf. MONTELL II, p. 90. — 4803. 428. Hangiya. Fig. 105.

131. Bronze seal, much corroded, square, with swastika device, shank at back. Cf. MONTPELL II, p. 89 and Pl. V. — 4803. 416. Islamabad. Fig. 106.

132. Bronze seal, triangular, with acanthus in low relief. Triangular shank on the reverse. 4803. 414. Islamabad. Fig. 108.

133. Ditto, square, with similar design in each corner. Islamabad. 4803. 415.

H. Intaglios or gems.

Intaglios are gems with incised designs in contrast to cameos, in which the design is in relief. Intaglios are mostly ornaments, but they can be mounted, e.g., in a seal-ring and can in that case be used as seals. Intaglios as seals were used already in very ancient times in the most ancient East. They were popular, too, in the ancient classical world and later in Persia. Quantities of intaglios have been found in Eastern Turkestan, incised in local semi-precious stones. A monograph on the subject would be extremely desirable and might be prepared in Vienna. Here only the gems in the Mannerheim collection are published with casual, brief references to analogous objects. The gems are cut with considerable skill in cornelian, chalcedony and other local semi-precious stones to be found in the region of the Kun-Lun range. Many of them are the work of old Khotan engravers; others are undoubtedly late classical products and must have been made much further west. There are Persian looking scorpions, busts of Roman warriors, Sasanian kings who had many relations with India and Central Asia.

Besides intaglios there are other polished, semi-precious stones from Turkestan without engraved figures. Some are extremely small. They decorated gold jewellery. Such incrustations were and had always been popular in Iran and the custom spread during the Sarmatian period to South Russia and subsequently with the Germanic tribes thence to Western Europe, where incrustated ornamentation became extremely popular.

Reference should also be made to the Buddhistic custom of placing small hemispherical semi-precious stones and glass beads on the foreheads of statuettes representing deities and wise men (the «urna», cf. p. 28). At all events, the stones were used for artistic decoration, mostly for intaglios.

The Mannerheim collection contains 10 intaglios (4803. 364).

134. Light green volcanic stone. A very roughly cut, straight-horned sheep or goat to link 6×5 mm. Fig. 112.

135. Yellow agate or cornelian. A bird (wader?) with long legs. »L. 6×6 mm. Fig. 113.

136. Reddish cornelian. M-shaped figure. Fig. 114.

137. Reddish-yellow garnet. Symmetrical tulip. 8.75×9 mm. Fig. 115.

138. Red garnet, optically isotropic. Standing figure, profile L. Carrying a spear. Behind, a fourfooted animal with a tail. 5×4 mm. Fig. 116.

139. Violet or black onyx. Human bust in profile looking L. Sharp nose, pointed ears with ornaments. Necklace. 12×12 mm. Fig. 117.

140. Yellow cameo. Female figure, profile L, with sheaf of corn. 8 1/2×10 1/2 mm. Fig. 118.

141. Red garnet. Roaring lion, with head thrown back. Surrounded by frame. $12 \times 12 \frac{1}{2}$ mm. Fig. 119.
142. Green volcanic glass. Scorpion. 9×8 mm. Fig. 120.
143. Light-green glass, elliptical. Bust of bearded man in R profile. Bushy, Turkish cap, «kaftan». $10 \times 15 \frac{1}{2}$ mm. Fig. 315. XVIII century? Fig. 121.
144. Semispherical small polished garnet, yellowish-red.
145. Bead, pear-shaped, of steatite. With bronze pin inside. Islamabad. No. 4803. 405. Fig. 127.
146. Ornament of red agate or cornelian with white figures. Fig. 125.
147. Ornament of flint in the shape of an oblong bead, surface ornamented with dark lines. Islamabad. Fig. 128. Cf. STEIN, *Innerm. Asia*, Pl. X, Kh. 031.
148. Piece of light chalcedony. Islamabad. Fig. 129.
149. Barrel-shaped bead of agate. Islamabad. 4803. 409. Fig. 124.
150. Plastic bird figure. The bird holds a pear-shaped thin pouch between its claws; tail feathers indicated by means of very thin lines. Greyish-yellow serpentine. Yotkan? Fig. 123.
151. Thin bird-shaped plate of mother-of-pearl. One side smooth. Yotkan? Fig. 122.

I am indebted to Professor A. LAITAKARI and his assistant Dr. KALERVO RANKAMA, of the Geological and Mineralogical Institute at the University of Helsinki, for determining the species of stones.

With regard to intaglios I refer the reader, in addition to general works, to Sir A. STEIN, *Innermost Asia*, Pl. CXI. Also to C. TREVER, *Сообщения Гаймк* 1931. 2, p. 19.

I. Other finds.

In addition to the above the Mannerheim collection contains a number of coins, fragments of small objects that cannot be determined from the village of Kainak, Kelpin, Qarashahr, Maral Bashi, from the vicinity of Qulja (4803. 626—638), from Qara Khoja, Yar Khoto, Toyuk, Tsiktym etc. (4833. 235, 239—251), unornamented buttons etc. (4803. 436—440) from Keriya, pieces of glass (4803. 388) from Myslyk, and from Islamabad (4803, 407, 408, 410) etc.

There are also a number of documents in the collection, altogether 11 fragments with uncertain particulars of the finds. They were published by the late Professor J. N. REUTER in the *Journal of the Finno-Ugrian Society*, vol. XXX. 37: Some Buddhist Fragments from Chinese Turkestan in Sanskrit and «Khotanese» (37 pages and plates).

The Mannerheim collection also includes a small tombstone with a Syrian-Nestorian inscription (4803. 535). It comes from the furthest NW corner of Eastern Turkestan, from the neighbourhood of Suitin near Khorgoz, between Dzharkand on the Russian and Qulja on the Chinese side. The stone is a natural stone, 251, 165, 101 cm in size (Fig. 130). The inscription on the tombstone, as translated by Professor ARTHUR HJELT, is as follows: «Haditha who departed from this world, holy, believing, in the year 1683.» The date is reckoned according to the Seleucidic chronology and represents A.D. 1372. — The first word Haditha is a pure

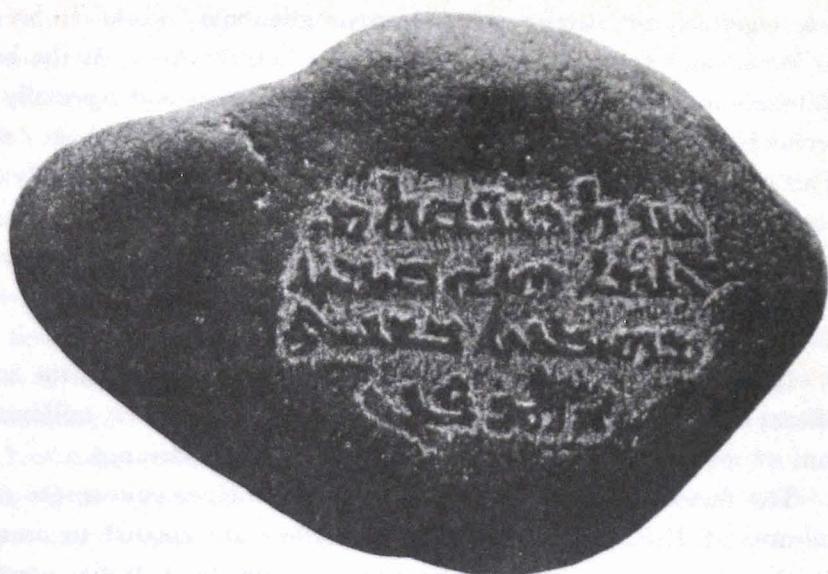


Fig. 130. Tombstone from
Suijin. 1/2. (535).

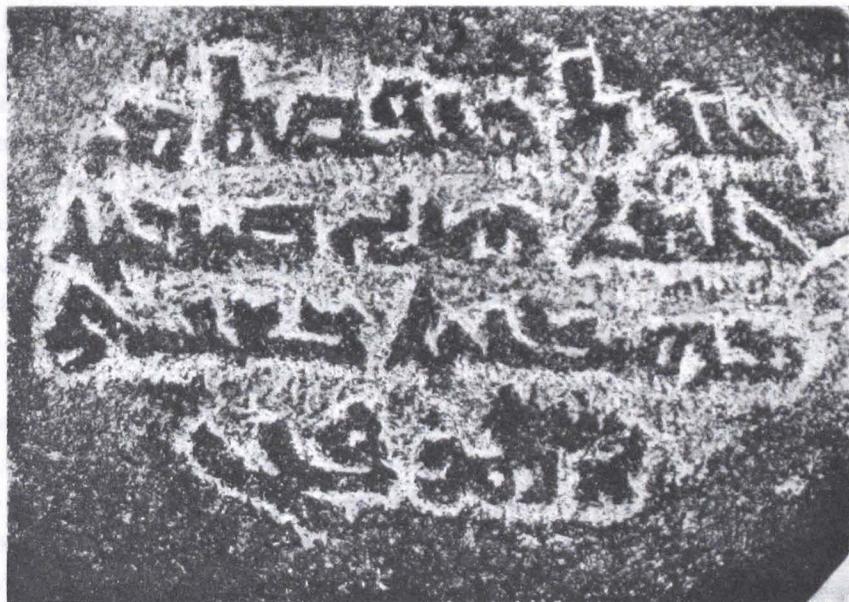


Fig. 131. The inscription.

Syrian name, but could, perhaps, also be read as »hedatha»; that is an appellative word meaning a young wife, recens nupta mulier. The inscription is skilfully carved, the script being in relief; the letters are large, in beautiful Estrangelo type (Fig. 131). The stone does not bear a cross. The language is pure Syrian, without a Turkish strain.²⁹

This stone testifies to the flourishing Syrian settlement in Central Asia in the later Middle Ages. The Nestorian church originated in Eastern Syria during the fifth century,

²⁹ Cf. ARTHUR HJELT, *Drei syrisch-nestorianische Grabinschriften*. *Annales Acad. Scient. Fenn.* Vol. B 1 No. 2. 1909. The origin of the find is erroneously stated. — Cf. a somewhat different paper on the same subject by the same author with some mistakes. *Suom. Tiedeakat. esit. ja pöytäk.* I, 12/12 1908.

was vigorous and carried on industrious missionary work. It became the state religion in Persia and spread thence to India and Central Asia. At the beginning of the present millennium the districts round Samarkand, Tashkent and especially the whole of the Semirechie between the mountains of Alatau and Tarbagatai or Lake Issyk Kul were Christian. This church perished about the year A.D. 1400, when the princely class and soon after the common people adopted Islam.

III.

If we are to understand and characterise the culture and the society with its various phases of life that are represented by the finds from the first millennium in Eastern Turkestan, we must remember some general points of importance.

The factors that created this urban and religious culture are not of local origin. The cultures of Khotan and the Turfan regions are created by immigrants with a highly developed earlier civilisation that originated partly in India, partly in Iran-Bactria and, later, in China and her northern border states. Their religions represent foreign «high religions» with very differentiated customs and ceremonies. They are only capable of elucidating one side of its daily life, the urban and literate side and its various aspects. For an investigator of a whole local culture this is not enough. The urban cultures are not the oldest in Eastern Turkestan, nor did they originate there: their conditions and forms of development should be studied in those countries, in which they originated and took shape and in which the religious movements were created by individual great mystics, prophets and communities. The inspiration came from there. On the whole, the antiquities from Eastern Turkestan display reflex cultures or, perhaps, actual emigrant cultures maintained by clever businessmen and religious bodies, possibly in the same way as Europeans have done, e.g., in Africa.

That the readymade «high cultures» in Eastern Turkestan flourished and developed, it was possible owing to certain geographical and economic conditions. Trade in Eastern Turkestan could prove so profitable that urban and monastic communities without agriculture of their own could flourish. Eastern Turkestan is a typical transit area and possesses a draught animal, the camel. Had this not been the case, the urban oasis communities would not have been able to support cultures of the kind that the antiquities indicate. The pack-camel of the two-humped, i.e. Bactrian, type played a decisive part in the trading community. We can, indeed, maintain that the camel, as it were, creates unmartial wealthy trade cultures with enterprising classes that carry on transit trade. We see the difference, if we pass on to the regions further west, to the steppes (not deserts) of Sogdiana and Kazakstan. There the horse played as important a part as the camel in Eastern Turkestan. There highly organised military communities originated.

Very little is known about the implements and tools used in the daily life of the local agriculturists and craftsmen in old Eastern Turkestan. If we did not know the general state of culture of the country with towns and monastic communities and extensive trade connections, we would certainly underestimate its ancient local culture.

When we see collections like that of the Ethnographic Museum in Stockholm, which illustrates modern ethnographic culture in Eastern Turkestan, we notice that, besides ordinary tools, such implements and tools as sickles with a straight blade for rice fields, spades of a special type for digging up these fields, knives for cutting the ears of corn, chisels for making idols, moulds for casting amulets and amulets themselves, plates for rubbing colours etc. were certainly already used in prehistoric times.

Other tools that certainly existed very early consist of bone bridle-bits and driving ropes for camels, surgical instruments, miniature weapons used at ceremonies, belt hooks for cloaks etc. Extremely little of all this has been preserved from earlier times down to the present day. It is only the plentiful finds in recent years of wooden objects, preserved in graves in the desert sands of Sinkiang, at Lou-lan, and particularly at Astana that begin to provide us with such materials. I refer the reader principally to the splendid publications of the Sven Hedin Sino-Swedish expedition, particularly to Vol. 7.1, *Archaeological researches in Sinkiang*, published by FOLKE BERGMAN in 1939, containing 258 pages, 20 halftone plates, 2 coloured plates, 36 collotype plates and 52 illustrations and maps in the text. Sweden now unquestionably occupies first place in the archaeological exploration of Central Asia.

We have seen that the remains of old cultures in the Khotan oasis, preserved in the Mannerheim collection and in most of the other existing collections, consist of clay debris of vases and other pottery. Among the secular finds pottery occupies a central position. The clay vessels are and were receptacles for storing liquids, water, wine, oil, salves, the importance of which is much greater under a burning sun and in regions with little fresh water than, e.g., in Northern Europe. Clay keeps water cool and was able to maintain its practical and ornamental position. Pottery is also extremely suitable for all kinds of small decorative objects, especially before people learnt to use china, porcelain, glass etc.

Another group of the antiquities of Eastern Turkestan consists of small ornaments. Small objects were always popular in the East, in the Hellenistic and Buddhistic as well as in the Chinese world.³⁰ In the higher forms of culture metal, both precious metals and bronze, generally predominate as a material for ornaments. In Turkestan clay was mostly used for this purpose, too. The objects were made by individual craftsmen, mostly by clay casters in the form of mass production; the craftsmen sold their work in the bazaar, where it was bought by the inhabitants of the province. The shapes and designs on these terracottas are often borrowed from outside, but the manufacture was indigenous and local. This local trade satisfied the demand, but nothing much was expected, except among the monks and priests and probably by a few big merchants. In these circles we can speak of indigenous, truly artistic objects, of which there are one or two in the Mannerheim collection and large numbers in the museums of Stockholm, Petropolis, Berlin, London, Paris etc. Nothing new can be said of the origin and development of this phenomenon until proper excavations have been made in Gandhara.³¹

When various culture formations and their mutual connections and value are discussed

³⁰ Mainly during the T'ang period.

³¹ For new finds see *Ill. Lond. News* 1938, Dec. 24: *The Enigma of Greco-Buddhist Art in India*. Excavations in the Swat Valley, North of Peshawar.

in archaeological literature, it is often, besides pieces of pottery, principally metal objects that are compared with each other for natural reasons — they are best preserved — but in doing so we run the risk of arriving at a very incorrect synthesis. Metal is rather rare among the antiquities of early Turkestan. This is not a sign of poverty, as archaeologists often assert. Metal by no means invariably formed the main point in every »metal culture formation». Neither are metal objects artistically the most important. In all ancient cultures there were main products of perishable material, wood, leather, textiles, that characterise the achievements and conditions of culture and art better than simple pottery and metal objects (among which the knife was certainly the commonest).

Besides, even if the metal objects are decorated and even if the pottery is still often ornamented during the metal period, it is mainly in textiles, carpets, rugs, perhaps even in wood that the artistic development of the people, which lends colour and character to its culture, can be observed. Estimates of different ancient cultures are therefore frequently rather schematic and unreliable, when they are based on the objects preserved, their forms etc. The actual character of the basis of life of the society in question, its production and trades must first be ascertained before comparisons and a synthesis are attempted. The phenomena are quite different in the case of cattlebreeding-nomadism or ancient peasant villages or of old industrial communities with established trade routes and safe means of communication. The preserved prehistoric objects must not lead the scientist astray into a standardised treatment of the material as a main document of culture. Wise judgment in the scientist of the social life and conditions of the early periods should have greater weight than a formal treatment of the material. This applies to a great extent, too, when dealing with the culture of the steppes or deserts of Central Asia. It does not tell us enough, if it is only stated that the principal finds belong to the class of pottery. The other antiquities from the Khotan oasis have generally perished.

IV.

However, it is not only the internal general character or the origin and position of the culture of Eastern Turkestan towards the parent high cultures that interest us in this connection. This is a separate problem and cannot form the object of investigation at present. Another fascinating problem that has been little investigated consists of the active connections of Central Asia with the different border cultures on the periphery in the north, of a different structure and different kind, beyond the sphere of regular trade with the high cultures to the south. A connection was maintained with the horse-riding northern nomads and »prehistoric» agricultural steppe and forest tribes of the north-eastern and north-western border cultures. We do not know much about it, but in any case we know something.

A. It is not surprising to find analogies to the cultures of Eastern Turkestan and India in Russian or Western Turkestan. From Eastern Turkestan the trade route went westward over Yarkand and Kashgar or over Balkh to the basin of the Oxus. This latter westernmost part, Marakanda < Samarkand = Sogdiana, belonged at one time to the Persian

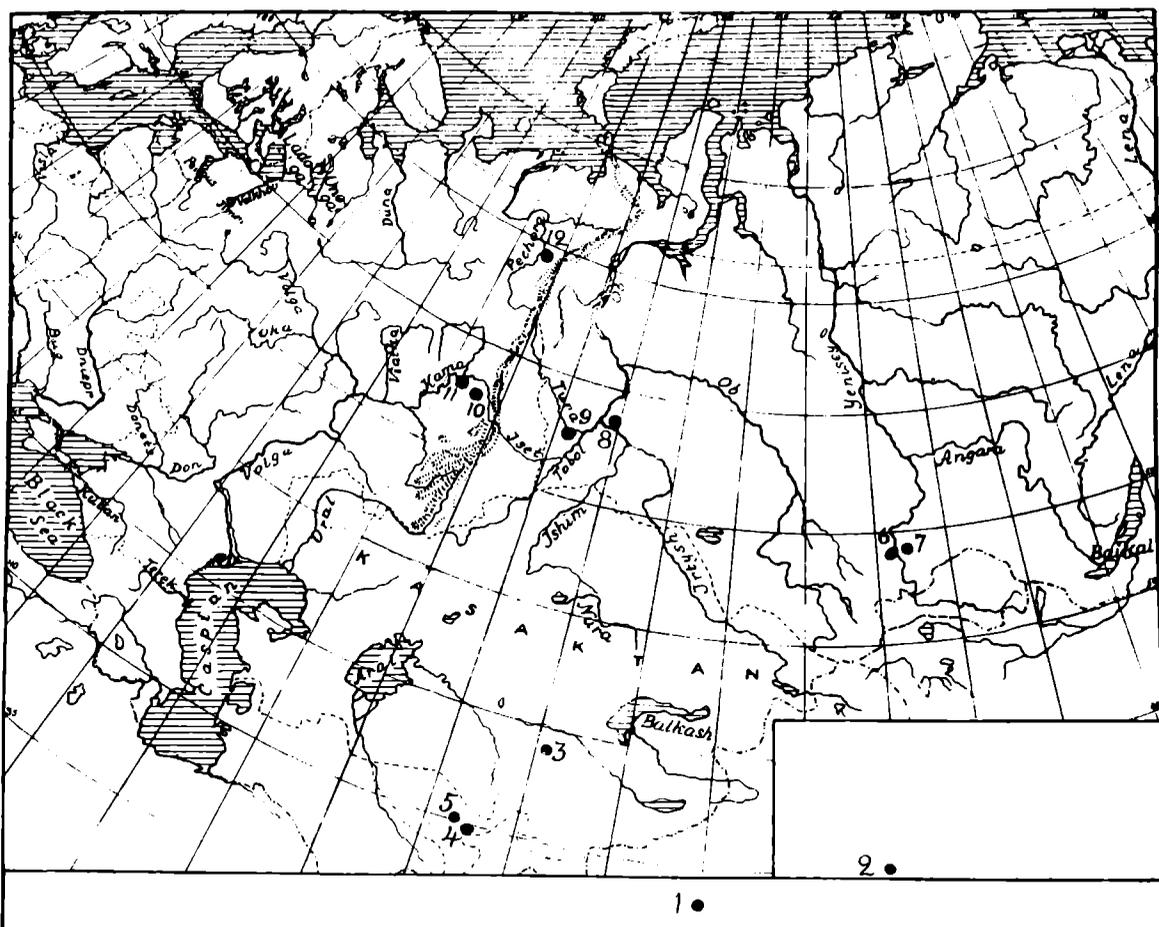


Fig. 132. 1 Khotan. 2 Turfan (Astana). 3 Talas. 4—5. Afrasiab and Katta-Kurgan. 6 Oglakty. 7 Tes kurgan. 8 Tobolsk. 9 Tyumen. 10 Gorbunyata. 11 Glyadenovo. 12 Podcherem.

Empire and in the time of Darius it was conquered by Alexander the Great who destroyed Marakanda, the capital and trading town. The town was soon rebuilt, possibly on another site, and was still a considerable and important commercial town even during the Sasanian dominion, Mazdeism being the principal religion. Ancient Marakanda lay just E of the present Samarkand (map, N:o 4). Its younger descendant during Grecian, Parthian and New-Persian times lay N of Samarkand, in the Katta-Kurgan canton (map, N:o 5) west of the Syr Darya (*Изв. ГАИМК* IV, p. 121). Excavations have scarcely been begun in this extraordinarily important area for the history of civilisation, but the finds we have are conclusive proof of connections with Eastern Turkestan. From Afrasiab and from Katta-Kurgan we have rich finds of terracottas, applications of vases and, above all, of a s t o d a n s, ossuaries, in which according to Zoroasterianism the bones of the dead, freed from flesh, were collected and buried. In the south these ossuaries were mostly of a quadrangular shape, corresponding to the shape of dwelling-houses; further north they were oval like felt tents and yurts. The ossuaries were richly decorated with applications of human figures; some of them represent Grecian ideal figures, such as Apollo and Alexander the Great, silenes, sirens etc. Some of the appliquéés of Western Turkestan appear to have done

the same, as they did, too, in Gandhara. These materials are insufficiently known at present. I mention the following literature:

Zeitschrift für Ethnologie, 1890. XXII., p. (347).

K. INOSTRANTSEV, *Туркестанскіе оссуаріи и асоданы*. *Зап. вост. отд. РАО XVII*, p. 0166. (1907).

N. VESELOVSKI, *О находкѣ глиняныхъ гробовъ въ Самаркаудь*. *Зап. вост. отд. РАО XIII*, p. II-IV. Id., *Еще объ оссуаріяхъ*. *Ibid.* XVII, p. 0176.

Id., *Греческія изображенія на туркестанскихъ оссуаріяхъ*. *Изв. Имп. Археол. Комм.* 63 (1917), pp. 59—68.

V. BARTHOLD, *Еще о самаркандскихъ оссуаріяхъ*. *Зап. вост. отд. РАО XIII*, 1901, p. 099.

Id., *Къ вопросу о туркестанскихъ оссуаріяхъ*. *Изв. ком. уѣзч. Средн. и Вост. Азіи* 1908 No. 8.

Id., *Отчет о командировке в Туркестан*: *Изв. ГАИМК II* (1922), p. 18—19, Pl. III.

C. TREVER, *Terracottas from Afrasiab*. *Изв. ГАИМК* 93, 1934.

Afrasiab was, possibly, a station on the road from the northern fur forests southwards, to Khotan, but also to Gandhara, India and China.

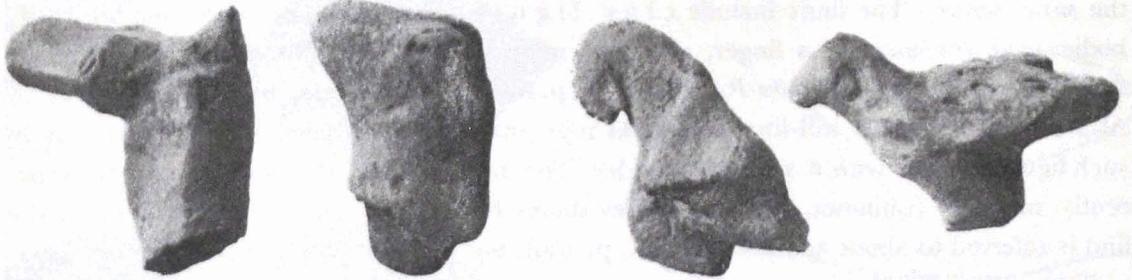
During the last few years considerable new finds have been made in Russian Turkestan which afford evidence of the importance of the Greco-Buddhistic culture there. Only short notices of these have appeared in print. At Airtam, about 13 km from Termez, pieces of a stone frieze from a Buddhist sanctuary of the period about the birth of Christ into A.D. 200 were discovered in 1932 and 1933. The frieze depicts 3 musicians with lute, harp and drum. A. Y. YAKUBOVSKI, *Государственный Эрмитажъ, Культура и искусство Востока*. 1937. Cf. *Ars Islamica* V. 2, p. 235 (1938).

M. ROSTOVITZEFF, *Dura and the Problem of Parthian Art* (1935). Yale Classial Studies V, p. 158.

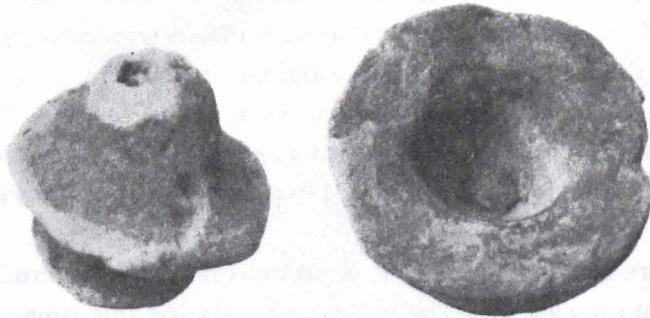
I also refer to ROSTOVITZEFF's essay on the Indo-Bactrian «phalera» of Central-Asiatic origin found in South Russia (*Recueil Kondakov*, 1926) and to my essay «Portable Altars» in *Eurasia septentrionalis antiqua* XI. 1937, with their centre in Central Asia.

B. But Central-Asiatic culture did not spread only to Russian Central Asia. It also extended to regions far removed from it, the steppes of Siberia and the wood belt beyond them, the Ural district and to the neighbourhood of the Yenissei.

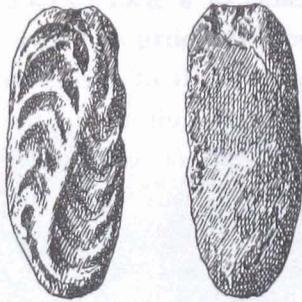
From Western Siberia, from the Ob-Irtysh basin, we know of traces of cultures that lead towards Indo-Bactria and Eastern Turkestan: partly objects of gold, fittings for straps and belts, that may, indeed, be slightly older on the whole than the Bactrian dominion, but are partly contemporary with it, and partly with the new Iranian dominions. These fittings supply reproductions of the Central Asiatic yak ox, the camel, fantastic Indian snakes etc. (see, e.g., BOROFFKA, *The Scythian Art*, Pl. 50, 53) and are a token of Central Asiatic trade. Another witness of connections consists of some terracottas, approximately of the same kind as from Eastern Turkestan. These terracottas are discovered near Tyumen, Tobolsk, possibly too at Ekaterinburg. They belong most probably to the time about the birth of Christ and the first centuries A.D. At Tyumen (map, N:o 9)



1-4. 1/1.



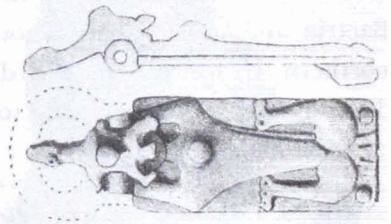
5-6. 1/1.



7. 1/1.



9. 1/2.



8. 1/2.

Fig. 133. 1-6. *Terracottas* (from Afrasiab?). 7. *Gypsum ornament, covered with gold-leaf. Tes kuyan.* 8. *Belt clasp, with the needle in the shape of a camel. Finland.* 9. *Straw doll from Astana.* After A. STEIN.

about 4 km from the town, several kurgans were opened on the river Mys in a village of the same name. The finds include clay figures of horses with roughly made bodies, the thickness of a finger, about 8 cm in length. Reproduced in the Gorodtsov complimentary volume, *Труды РАИИОН IV*, p. 196 Pl. XIII. 7 (essay by P. A. DMITRIEV). — At Tobolsk, in the hill-fort Chuvasski mys (map, N:o 8), ZNAMENSKI found about 20 such figurines, one with a saddle and rider. The inner part of the horses' legs was apparently made of fishbones, but the figures themselves are of terracotta. The date of the find is referred to about 500 B.C. (*op. cit.*, p. 199), but it is certainly several centuries later. — There is, too, a collection of such figurines (see Fig. 130. 1—6) in the Zausailov collection in Helsinki; according to the catalogue they were found at Shartazhkoye ozero near Ekaterinburg/Sverdlovsk. This statement is incorrect and the objects were probably discovered in Russian Turkestan,³² but the fact remains that such plastic terracotta figures were actually found to the east of the Central Urals. They originate from Central Asia, from Sogdiana or Semirechie or, perhaps, direct from Eastern Turkestan.

All the finds mentioned here are situated east of the Urals, in Siberia, although in an administrative sense Ekaterinburg belonged to the government of Perm, i.e. to European Russia.

C. So far there are not many traces of connections between Eastern Turkestan and the northern part of European North Russia during this time. But it is perfectly certain that the connections extended comparatively early in the first century A.D. from Central Asia to North-Eastern Russia. It was from the forests on the Kama and Pechora that the valuable furs spread on a large scale to Central Asia.³³ This is proved by the oriental silver objects on the Upper Kama³⁴ (in «Permia»), by some Permian fittings,³⁵ by the equestrian statue from Tuya,³⁶ imitations of the Sasanian figures from Podcherem³⁷ on the Pechora and so forth. Probably these trade relations began early: I remind the reader of a Bactrian coin from Glyadenovo³⁸ in Perm (map, N:o 11) of the time about the birth of Christ. There is nothing impossible in Perm furs having passed through the hands of agents to Bactria and possibly viâ Khotan further, towards China.³⁶ The forest cultures in the northern Urals and in the desert oases in Turkestan were, however, too completely different for the connections to have influenced one or other of them.³⁹ It was the agents

³² V. A. TOLMACHEV's statement in a letter to the author in 1917, quoted in *Coll. Zaouss.* II, p. 47—48.

³³ A. M. TALLGREN, *Die »allpermische« Pelzwarenperiode an der Pečora. Suomen Muinaismuistoyhdistyksen Aikakauskirja* 40. 1934.

³⁴ J. SMIRNOV. Восточное серебро. 1910.

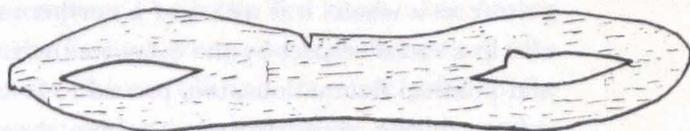
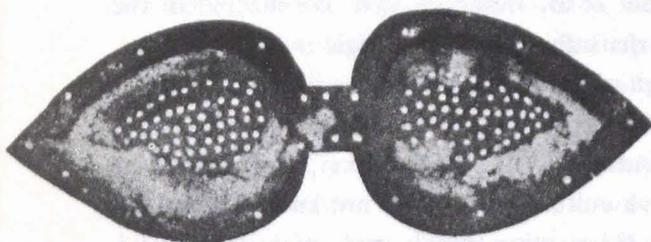
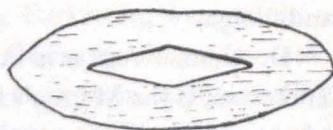
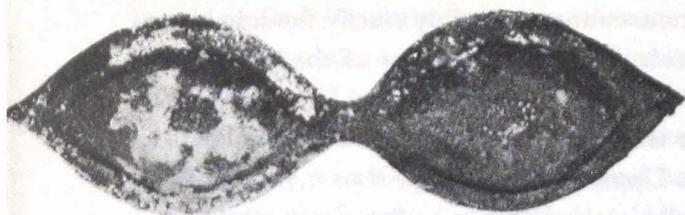
³⁵ N. CLEVE. *Eldstål med bronsfäste. Finskt Museum* 1929, p. 51 sq. It is probably from East Russia, too, that a curious belt-clasp with the needle in the shape of a Bactrian camel, found in W Finland, originated. It is probably of Asiatic origin (Fig. 133.8).

³⁶ A. V. SCHMIDT, Туи́нский всадник. Записки колл. востоковедов I, (1923) p. 410.

³⁷ V. A. GORODTSOV. Подчеремский влад. Советская археология II (1937), p. 113 sq. (esp. p. 141).

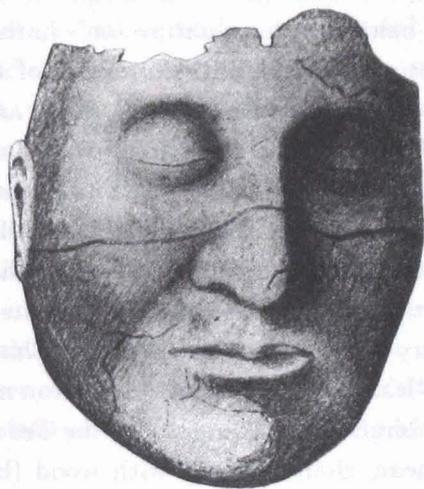
³⁸ A. SPITSYN. Гляденовское кочене. Записки Имп. Русск. Арх. Общества XII.

³⁹ I refer, however, to silver «spectacles» placed over the eyes and mouth of the dead in the graves from Astana near Turfan (Fig. 134. 1—2, see note p. 14); cf. similar ones from Gorbunyata in Perm (Fig. 134. 3—4). Cf. however analogies, too, from the Crimea. Sasanian period. — Was this custom originally Byzantine or Persian?



1—2. *Silver spectacles. Turfan.*
Astana. After A. STEIN.

3—4. *Silver mouth and eye cover.*
Corbunyata, Perm.



5. *Gypsum mask.*
Tes kurgan.



6 a—b. *Gypsum mask.*
Oglakty.

Fig. 134.

who were subject to influences from the different cultures, possibly chiefly the inhabitants of the steppes on either side of the southern Urals, in the water basins of the Irtysh, Ural and Volga.

D. Another region in Asiatic Russia, where traces are found of the cultures of Eastern Turkestan, is the *Minusinsk* district on the Upper Yenissei (map, Nos 6,7). Here these relations exerted a greater influence than they did in the Urals or in Permian. In this case it is clearly not a question only of importation, but of an influence that is reflected in the culture as a whole: it is a case of a northern district influenced in a religious and, perhaps, also in a social respect by the more southern high culture. It is not impossible that ethnical and political fluctuations, too, proved to be contributory factors. I refer to the *Minusinsk* culture during approximately the first three centuries A.D., known, e.g., from the *Teskurgan*⁴⁰ and under the name of the *Tashtyk* culture.⁴¹ Its relics are known by means of several gravefinds, possibly also rock pictures,⁴² irrigation canals and mines. This is a case of a so-called Iron Age culture with miniature tools in the graves; in the form of the subterranean skeleton on graves, «ossuaries», in their manner of sepulture with gypsum masks and wooden objects, of the same kind as in Lop-nor sites⁴³ and Central China.

In *ESA XI*⁴⁴ and in *SMYA 29*⁴⁰ I described two grave constructions or cemeteries which are typical in this respect: the graves in *Oglakty* and on the *Tes* (map, Nos 6 and 7). I refer the reader to these essays and will allow myself the following remarks.

Both the *Teskurgan* and the *Oglakty* cemetery belong to the Han period, most probably to its later part, possibly the time about A.D. 200. Both contain face-masks of gypsum cast in moulds (Fig. 135. 5, 6), *Oglakty* also wooden objects, bits of Chinese silk cloth and straw dolls, and *Tes* gold ornaments, gold-leaf, glass beads, bronze and iron miniature tools and bits of vessels of decorated leather and birch-bark. The grave in the *Teskurgan* was a large collective grave with a deep subterranean shaft revetted with wood (boards? logs?). It contained about 100 skeletons, the great majority not burnt, although the timber in the grave cellar, when it was filled to the ceiling, was set fire to and there are clear traces of fire in the furnishing of the grave. It is certain that this grave was an *astodan sui generis*, a secondary grave for decomposed corpses that had previously been exposed to the influence of the air and sun. Afterwards their bones were collected and the missing soft parts were replaced by face-masks cast in moulds and taken from the face of the deceased immediately after death and closely fitted on to the decomposed cranium; even missing bones, jaws etc. were «restored» with gypsum or clay. These double burials, the idea of the impurity of the flesh and the use of ossuaries are certainly an *Iranian* influence from Mazdeism on the Upper Yenissei, i.e. Eastern Iranian influence. The same probably applies to gypsum masks.

The Eastern Turkestan and other Central Asiatic graves of that time are not much

⁴⁰ A. M. TALLGREN, *Trouvailles tombales en 1889. Le kourgane de Tes. SMYA 29. 2.*

⁴¹ С. ТЕРЛОУКНОВ, Опыт классификации древних металлических культур Минусинского края. Материалы по Этнографии IV, 2, p. 41 sq. (50 sq.)

⁴² М. ГРЯЗНОВ, Боярская писаница. Проблемы ГАИМК 1933, 7—8, p. 41 sq.

⁴³ FOLKE BERGMAN, *loc. cit.*, esp. Pl. 7, 19, 23 and elsewhere.

⁴⁴ A. M. TALLGREN, *The South Siberian Cemetery of Oglakty from the Han Period. ESA 11, 1937. 69—102.*

known so far.⁴⁵ To some extent it was a case there, as on the Upper Yenissei, of burning the corpses and preserving the burnt bones, collected together and buried in small stupas and ossuaries. The ossuaries, astodans, at any rate in Western Turkestan, were made of terracotta, provided with terracotta figurines in appliqué. But unburnt tombs predominate.

The most probable are the two small rosette-shaped and oval gypsum appliqués (Fig. 133.7) from the Tes kurgan, covered with thin gold-leaf, analogies to the Turkestan terracotta appliqués and reposing on wooden sarcophagi.

The Oglakty graves are approximately contemporary with the Tes kurgan and belong to the culture formation that bears the name of the Tashtyk group and is contemporary with the later Han period. The Oglakty graves contain Chinese silk and therefore point to the east or south. There are analogies to the Oglakty wooden objects from the earthen graves of Eastern Turkestan which contain, among other things, Chinese silk of the Han period⁴⁶. All this points to connections southward, to the neighbourhood through which the great silk road passed. But on the other hand a trade route certainly started from Ferghana and Sogdia with their Mazdeitic culture north of the great border mountains to the upper course of the river Yenissei, where the Minusinsk district, an old cultural site, rich in metal, attracted distant trade in the same way as the northern fur forests attracted enterprise. There is even reason to assume that in the Minusinsk area there were trading settlements from Eastern Iran among the population owing to old connections with the Scythians. Turkestan probably imported metals, i.e. bronze from the Upper Yenissei. All these extraordinarily interesting questions tempt the scientist: we know very little at present, but we recognise great problems that can be posed. The Mannerheim finds are of great importance for further exploration and for Finland's future scientific investigation of the prehistory and early history of Asia, round which many legends have been woven.

⁴⁵ There are, as already pointed out, many newly published graves from the vicinity of Lou-lan which display many interesting analogies to Siberian tombs from the so-called Tashtyk period. Cf. BERGMAN, *loc. cit.* — STEIN, *Innermost Asia*, Chap. XIX.

⁴⁶ On the other hand, the Astana Cemetery seems to belong to a much later, Sasanian period. Here, there is a controversy which makes the date of the Tes kurgan somewhat uncertain.

COLLECTION OF
MANUSCRIPTS FROM EASTERN TURKESTAN
AN ACCOUNT OF THE CONTENTS

BY

G. RAQUETTE

When Baron G. Mannerheim was on his travels in the districts south of Taklamakān during the latter part of 1906, I had the pleasure of meeting him in the town of Yarkand. In the course of conversation we discussed the possibility of discovering some traces in the literature of the country that might serve to confirm the local tradition about the so-called Abdal tribe. It was generally asserted by the people in these parts that the supposed descendants of this tribe were to be found in certain specified villages in the neighbourhood of Kashgar, Yarkand and Khotan. In his *Report of a Mission to Yarkand in 1873* D. FORSYTH had already referred to the question of the Abdals and later F. GRECARD had dealt with the subject at greater length in his work *Mission scientifique dans la Haute Asie 1890—95*. Subsequently A. VON LE COQ also devoted his attention to this supposed fragment of a people, traces of which are said to have been found also in Persia. Incidentally, he endeavoured to discover some evidence of their foreign origin in their vocabulary, but he, too, was evidently unable to produce any conclusive results.

About these immigrants it was said in Eastern Turkestan that they had come to these parts very long ago and that they were and had to remain beggars from one generation to another until the Day of Resurrection. This judgment had been passed on them, because once upon a time they had been guilty of an offence against Husein, the grand-son of the Prophet, for it was said to have been their forefathers who, on the occasion of the outrage at Kerbela, never forgotten or forgiven by any Shiites in particular, had prevented the descendant of the Prophet and his men from drawing water from the Euphrates close by. In his hour of death, therefore, Husein is said to have cursed them and sentenced them and their children throughout the ages to remain strangers and beggars among the nations. Up to the middle of the 19th century these people were consequently reported to have led an isolated life in their villages and to have subsisted principally on mendicancy. Subsequently they had gradually settled down to a more regular mode of life as farmers and at the same time adopted the customs of the country and intermarried with the population surrounding them. They no longer acknowledge their foreign origin and energetically deny their Abdal birth, if they are questioned on the point. But the rest of the population point them out just as decidedly as Abdals. Many inhabitants of these Abdal villages have become

well-to-do farmers, but it is supposed to have been a matter of course down to recent times even for their prosperous men to be obliged to shoulder a sack sometime during the year, usually during harvest time, and to wander away to distant parts, where they were unknown, in the role of beggars.

The present collection of manuscripts was thus made in the attempt to extract some piece of information, which would in some way provide a foundation for the Abdal tradition, from the sacred documents that were preserved under the name of *Täzkir* at the tombs of various holy men in the vicinity of the Abdal district in Khotan. An examination of the materials, unfortunately, yields a negative result on this point, although in itself the collection is by no means devoid of value in other respects.

It may be appropriate at this point to say a few words as to the täzkirs in the collection. As far as I can see, there is nothing new in them, and in some cases the different versions repeat and supplement each other. GRENARD brought back a large collection of täzkirs from the tombs of holy men in Eastern Turkestan and so did M. HARTMANN, which both of them revised separately, and in addition single copies have found their way into various European libraries, including the University libraries of Lund and Uppsala.

Another scientist, who contributed to the interpretation of the täzkirs, is C. P. SKRINE in his work *Chinese Central Asia*, London 1926. On page 176 sq. he describes a MS., the contents of which proved to be identical, on the whole, with No. 1 in the present collection. In this connection SKRINE mentions that GRENARD proved that all these täzkirs should be referred to the beginning of the 18th century, and gives the following synopsis of the latter's description:

«They are Sunni editions of the original Shi'a legends of the eleventh to the fourteenth centuries. Even the Shi'a legends, however, were not original. They were adaptations by the early mullas of pre-Muhammadan traditions connected with ancestor-worship at local shrines. None of the Twelve Imams came to Kashgar at all; the heroes of the legends were almost certainly eighth to tenth century Shi'a adventurers escaping from the persecution of the Omniad Caliphs and other Sunni authorities. With small bands of followers, these bold Saracens raided Chinese territory in much the same way as their Western brethren raided Europe, and their exploits became legendary, like the eighth-century Saracen raid into the south of France which ended in the battle of Poitiers. These »Immams« accomplished little, and they were all either killed or taken prisoner by the natives. None of their raids, GRENARD thinks, preceded the authentic attempt of Q u t a i b a h to impose Islam upon Kashgaria in the tenth century; it was Q u t a i b a h who led the way, and yet he is not mentioned at all in the tazkiras and is entirely forgotten. This is because he was a Sunni».

I

On a loose paper inserted among the pages of the manuscript the collector has made the following note: »Täskir from the mazaar with the tombs of Avamudin, Nasredin, Kovamudin and Nizamudin at Kohmari opposite Udjat on the river Qaraqash. Bought through Badsuddin Khan in Khotan. Dec. 1906.»

Size: 150×215 mm, back 12 mm thick. The cover is flush with the edge.

Binding. The manuscript is enclosed in semi-stiff paper covers of sheets of handmade Khotan paper, gummed together and covered with printed cotton cloth with a design of leaves and flowers on a red ground, which passes over the back in one piece. There is no capital. The binding is torn and spotted. Of the back only two narrow strips are left which hold the cover together. The separate sheets are stitched together by coarse, twisted cotton thread. The insides of the cover and the flyleaves are covered with writing exercises and drawings.

The *paper* is the usual handmade Khotan paper, glazed in the manner of the old Eastern Turkestan scribes which consisted in rubbing a smooth, round stone backwards and forwards over the sheet slightly damped in rice water, spread over a smooth surface. The scribe seems to have made use of ruling for the lines only as an exception, but instead there are lines from top to bottom impressed on the paper to guide him as regards the beginning and end of the lines of verses.

The *writing* bears evidence of a well trained hand and is a mixture of *nesich* and *nestalik*, displaying an occasional tendency towards both *divani* and *rik'a*. It is done with a *reed pen* and black China ink and is generally legible.

The *style* and *contents* consist of so-called »*parmak*» or finger verse, evidently intended to be nine-syllabled, but there are many irregularities, especially in the beginning, so that eight, nine and ten-syllabled lines occur indiscriminately without any systematic order.

It is only in a bit of four lines on page 12 that the writing is in prose.

The first eleven pages are taken up by an introduction about the creation of the world and praise and finally a genealogical table. A synopsis of the further contents follows in prose on page 12. These lines are as follows in translation:

»How the holy imams sent his holiness Yusuf Qadir Khan Ghazi from Maverannahar to Kashgar as an envoy, how he brought the missive (*namä*) to Kashgar and how the Kashgarians, seeing the missive, said: If he is a descendant of the Prophet, we will adopt Islam.»

The subsequent narrative coincides on the whole in its contents with *T ä z k i r ä p a d i s c h a n d j e h a n*, a description of which will be found in MS. II.

Finally the author proceeds to write about himself, how he was inspired to write his verses about the four holy imams, how his father reached the age of forty without having a child, and how the author then came in answer to his prayers, how he went to school and made great progress there, especially in composing poetry and was therefore called »the little poet«. His real name was Mullah Niaz. In conclusion he mentions that he completed this poetic work in the year 390 of the Hegira, 1000 A. D. This must be an error in writing or some other mistake, for the poet refers in the text to Mir'Ali Shir who lived and composed poetry during the latter half of the 15th century of the Christian era. This work must therefore have been written later. But when? The author does actually give four valuable indications besides the year, by which means it is possible to correct the erroneous year, for he mentions that he completed his work on the 10th day of the month of *zuhlädjä* and adds that it was a Friday in the year of monkey and the month of

hamal in the solar year. If we could ascertain, where these four determinations of time coincide, we should be able to decide with some certainty, when the author finished his work. Curiously enough such a coincidence seems to have occurred only once during the time in question, i.e. after Mir'Ali Shir's time. According to the calculation of the Mongolian solar year-cycle, which had been in use in Eastern Turkestan since ancient times and which differs there by four years from the usual one, the monkey-year coincides with the equinox of 1737 A. D., when the month of *hamal* begins, and in it the 10th of *zuhlädjä* in the year 1149 of the Hegira coincides with Friday, April 10th. Thus the author of the book must have laid down his pen on Friday, April 10th, 1737, according to the Gregorian calendar.

On the last four pages the last copyist launches into poetry on his own account in a supplement and makes his verses rhyme all the time with Sultan Sä'id Quëqar Ata. There is no statement of historical import in these pages. Finally we are told that the copy was transcribed by Mullah Osman and completed in the town of Ildji (Khotan) in the year of the hare 1255 on the second day of *ara-ay*, which corresponds to January, 7th 1840, according to the Gregorian calendar. The manuscript evidently belonged at one time to a man of the name of Yusuf Akhon. This is proved by a note »This is Yusuf Akhon's book« which appears on the inside of the first cover, on the first page of the first leaf and a couple of times in the margin inside the book.

II.

There is a loose paper in the book dated December 1906 with the following note: »Täskir of the mazaar with the tomb of Imam Muzai Kazem in the village of Djuma bazaar half-way between the villages of Udjat on the river Qaraqash and Djamada on the river Yurun-qash. Bought from the mullah«.

Size: 120×165 mm, thickness of back 12 mm.

Stitched without covers and without wrapper, but complete with the exception of the first and last leaves.

Paper: Khotan paper smoothed by hand with marks of handpressed ruling, uneven margins, spotty and with some torn leaves, though the latter render the writing illegible only in exceptional cases.

The Handwriting is the mixture of *nesich* and *nestalik* commonly met with in Eastern Turki manuscripts, done with a reed pen in black China ink, but uneven and in parts hard to decipher. The book is written by at least three scribes.

Style and Contents: The style is prose throughout with a few bits inserted in verse, »parmak« verse. There is no indication as to when the book was written or who the copyist was. Possibly these particulars may have appeared on one of the missing leaves at the beginning or end. There are no historical dates whatever indicating any year in the täzkir portion of the book. The contents and title of the book are mentioned, however, on the first existing page as the history of the dynasty of His Holiness Muhammed the Elect, viz., T ä z k i r ä p a d i s c h ä h d j e h ä n. Then follows a register con-

taining »the names of the Lords of the prosperous constellation» which goes back from Häzrät Imam Naser-ed-din to the Prophet Muhammed. The historical description begins as follows:

»It is related that their holinesses the imams were four in Medain (the seven towns on the Tigris which together formed the Persian capital during the time of the Mohammedan conquest) and all princes. They sat on the throne and together bore the burden of government over the surrounding world. His holiness Yusuf Qadir Khan Ghazi prostrated himself according to the pompous and ceremonious order (saying): O my kings, the land that is called Kashgar is said to be entirely infidel . . . If you grant permission, perhaps it is possible that I should go (there) with a number of warriors.»

The narrative continues about the expedition of this Yusuf Qadir Khan Ghazi with 40,000 men to Kashgar and their arrival there. He carried a letter (namä), which declared that he had come on behalf of the chief of the four imams, imam Naser-ed-din, to convert the people of Kashgar to Islam.

After much negotiation and many threats the people of Kashgar are forced to adopt the new religion, but put forward the condition that the descendants of the Prophet should first come to Kashgar in person. The aforesaid Yusuf Qadir Khan Ghazi then despatches a letter to the high imams and then awaits their arrival. After waiting a long time he learns that a detachment of a thousand men is on its way from Andijan. When he rides out to meet the new arrivals, he finds that it is his holiness Shah Kazim who has arrived with much pomp and state. The latter announces that the holy imams had remained behind in the Andijan mountains and had sent him on in advance to inform Yusuf Qadir Khan Ghazi of their arrival. The war lords were His Holiness Sultan Mänsur, Hodja Sä'id, Hodja Ähmäd and Hodja Äziz.

First came Sultan Mänsur at the head of four thousand men with three Hodjas, whose names are given; then, at intervals of a day, came three more detachments of troops with a string of Hodjas, häzrät and sultans in each detachment, and all encamped on different sides round the town of Kashgar. The four holy imams, who had arrived at Kashgar with these troops, were His Holiness the imam Naser-ed-din, His Holiness the imam Mä'in-ed-din, His Holiness the imam Tahir-ed-din and His Holiness the imam Quwam-ed-din. When the people of Kashgar saw the multitude of soldiers which filled the country to such an extent that there was no room to place a foot on the ground, they saw nothing for it but to adopt Islam. Then H. H. Yusuf Qadir Khan Ghudja was made king over Kashgar. Thereafter H. H. marched on Yarkand, where he found many hundreds of people living in houses that had been made by digging into the ravine (yar). On his demand the people of Yarkand adopted Islam. From Kashgar the conquering troops then advanced further towards China (Majin). Then follows the account of the religious wars of various leaders, the Imam Muhammed Shakir and others, up to a new part, described as the fifth chapter, although there had been no division into chapters before. The fifth chapter consists of the history of Bakir padishäh, the sixth of the history of H. H. the Imam Djä'färi Sadik, and it is not until the seventh chapter that the narrative takes up the fortunes and death of H. H. the Imam Musa Kazim padishäh. For it was at this

man's supposed tomb that the present manuscript had been kept as a grave t̄azkir until it was sold by the sheik in December 1906.

The tale now tells how this Musa Kazim, who was the son of Djā'fāri Sadik, marched into China (Jin Majin) with 6,000 men in spite of the warnings of the old men that misfortune would befall him. In China they were met by an army of 20,000 and a battle of three days was fought, in which blood flowed like a river and the heads of the infidels lay about like heaps of stones. However, Musa Kazim was wounded. His blessed body had received fifty wounds. Nevertheless, he cast himself furiously into the fray, but an infidel crept after him and dealt him his deathblow from behind. Then a coffin came down from heaven and the dying imam laid himself down in it. Later men were sent out to find his dead body, but they returned emptyhanded. It could not be found anywhere, although they had sought for it right into China. Finally two different versions are told as to what was considered to have happened to his dead body. According to one version his remains found their way into the neighbourhood of Khotan and according to the other the coffin with the dead imam was conveyed by angels to Mecca and buried at the feet of the holy forefathers. Thus the t̄azkir does not provide any evidence that it was precisely Djuma Bazaar that was his last resting-place.

In the following chapter, the eighth and last, the history of H. H. the Imam 'Ali Musa Riza is related and this ends the biographies of the dynasty. Then follows on four pages with the introduction »bismi-l-lāhi-r-rahmāni-r-rahīm» praise in mixed Arabic and Eastern Turki of the imam 'āzim Abu-Henifā and his development of the laws, and finally a list of the names of the eight paradises of Islam, which is not complete, it being continued on the last leaf of the manuscript which is now missing.

III

There is a note made by the collector in a loose scrap of paper as follows: »T̄askir of the mazaar with the tomb of Hazrat Sultan in Khotan. Bought from the mullah living in the village of Djamada south of Khotan on the river Yurungqash. December 1906.»

Size: 115×165 mm, thickness of back 18 mm.

Stitched with coarse, twisted cotton thread and enclosed on a loose cover of yellow leather, consisting of two pieces sewn together. The cover is too small to have served originally as the binding of the present manuscript. The book is incomplete, as both the beginning and the end are missing as well as several pages inside that should have formed part of the first and last parts.

The paper consists of Khotan paper glazed by hand and has no signs of ruling. The margins are very uneven and the first and last leaves are badly damaged by folds, rents and spots which render the handwriting illegible in parts.

The handwriting is done with a reed pen and China ink in a very mixed style, but is otherwise comparatively legible.

Contents: The contents consist of prose throughout with a couple of insignificant exceptions. The available part of the manuscript does not state, when it was written or

who the author was. Some peculiarities of dialect indicate that the scribe was a native of the neighbourhood of Khotan. The first 25 pages preserved contain a narrative in a romantic style about a faithful girl who was exposed to violence and unscrupulous treatment at the hands of infidels. E. g., one of her hands was cut off, but by a miracle a new hand grew in the place of the one cut off. After she had become a witness for her torturers through her enduring faith, it ends in their all being converted to Islam. Then a tǎzkir part is introduced by a bismi-l-lāhi -r-rahmāni-r-rahīm at the foot of the 25th page, with a biography of His Holiness the Sultan Abu-Sā'id Qujqar. First there is a summary of the lineage of Sultan Abu-Sā'id Qujqar and his youth, after which the narrative is continued by a description of how all his property with his harem and everything is destroyed by a catastrophe, fire and earthquake. He then goes in for growing vines and obtains miraculous crops, from which he makes wine and leads a life of pleasure in wine with about 40 friends. After a time, however, he hears a voice which tells him of the sinfulness and peril of wine drinking, and finally receives a definite call to become a dervish. He then converts all his companions in drink and they form a society of dervishes, of which he is elected sheik. There are now 41 dervishes who are to share their future fate. Qujqar is now referred to only as »sheik« in the narrative at first, but later also as »buzrukvar«. After another revelation, in which the voice commands him to emigrate to Persia with his companions, they leave Arabia, but their stay in Persia is not long, for the voice is heard once more, commanding them to go to China to spread the faith of Islam. They reach Khotan and go on to China, but here the historical narrative is interrupted by a number of miracles, and when the tale indicates that the sheik is approaching his end, full of years and at the age of 99, and is giving instructions about his burial etc., the narrative ends just as the tidings of death arrive in the shape of a beggar. Possibly the missing leaves at the end of the manuscript may have contained some information as to where his mortal remains were laid to rest, but on that point information is lacking.

IV

The collector has made the following note on the loose cover of the manuscript: »Tǎskir Hodja Abul Kasim. Dua Mazaar.«

S i z e : 125×197 mm, a thin book of 24 sheets.

S t i t c h e d with coarse cotton thread and without a cover. Originally the manuscript evidently consisted of 28 leaves, of which the 10th, 11th, 25th and 28th are missing. The 9th and 12th leaves are loose.

The *p a p e r* is carefully glazed, handmade, but has grown yellow with age with faint, though clear, signs of ruling. There are spots and signs of damage by water, too, though these have not made the handwriting illegible in any part.

The *h a n d w r i t i n g* is done in the usual manner with a reed pen and black China ink in two columns on each page. In general the handwriting is comparatively legible, although the conglomeration of letters in several places presents very considerable difficulties. The same hand wielded the pen throughout with the exception of the last four

lines, which represent the effort of an untrained hand to copy the first four lines of the page.

C o n t e n t s : The text consists throughout of »parmak» or finger verse. Evidently the author aimed at 10-syllable lines of verse, but there are numerous and irregular deviations into both 9 and 11-syllables. Both the choice of words and the form of verse indicate a Persian model, and it is, no doubt, very near the truth to assume that it was the Persian poet Ferid ed-din Attar (1119—1230)* who served as a model. The name of the author is given as Rehim Shah Sheik and the year, in which the book was written, as 695 (1296 A. D.). It would therefore be over 640 years old, which tells us that the present manuscript must be a copy, for both the paper and the handwriting prove it. But the copy does not state, how old it is.

The principle person in the narrative is Hodja 'Assār Sheik Buzrukvar, who was originally a shoemaker. The greater part of the work consists of a dialogue on rules of life, problems of religious philosophy and Sufi mysticism. The conversation is between the Sheik and the Hodja. The author only starts the täzkir part at the end of the book and the name of Qasim is introduced with a description of various miracles. In the conclusion the author mentions his ignorance and the difficulties presented by the task and begs the indulgence of the learned reader for his errors.

V

The collector's note says: »Täzkira from the mazar with the tomb of the Imam Muhammet Askari in the village of Aski near the town of Qaraqash. Bought through Badruddin Khan in Khotan. December 1906.»

S i z e : 128×187 mm, 32 leaves without a cover. The end is missing.

S t i t c h e d with a cover of simple Khotan paper.

P a p e r : common, slightly glazed Khotan paper.

H a n d w r i t i n g : the usual mixture of *nesich* and *nestalik* done with a reed pen.

C o n t e n t s : The textual form is narrative prose throughout with the exception of a verse or two in the text. The whole manuscript is evidently a copy from the same source that was used for *T ä z k i r ä p a d i s h ā h d j e h ā n*, described above under II. The narrative is the same and so is the wording with a few exceptions. There is no mention of the author of the book, its copyist or the date, at which it was written.

VI

According to a note made by the collector, this is the »täzkir from the mazaar with the tomb of Djafari Sadik in the town of Keriya and Shariat Nabovi — the laws and precepts of the Abdal tribe. Bought from the mullah in the village of Tamaghil. December 1906.»

S i z e : 208×255 mm and the thickness of the back about 25 mm.

*) See KLAPPSTEIN, PAUL: *Vier turkestanische Heilige, ein Beitrag zum Verständnis der islamischen Mystik*. Berlin 1919. (Turkische Bibliothek, vol. 20.)

The volume, without covers, is enclosed incompletely in a loose piece of brown leather. The sheets are stitched together with coarse, twisted cotton thread. The first and last leaves of the book are missing.

The paper is a soft, unglazed quality of handmade Khotan paper. No signs of ruling are visible anywhere, but the lines are nevertheless fairly straight.

The handwriting, the usual mixture of *nestalik* and *nesich*, though with a pronounced *rik'a* tendency, is done with a reed pen and black China ink. The writing has penetrated the loose paper to a great extent which makes it rather difficult to read, at any rate in some places.

C o n t e n t s : The textual form is mostly in prose with a verse or two woven into it. The last sixteen leaves, however, consist entirely of verse which is not divided into columns and lines, but is written in continuous lines, the lines of the verses being marked by four dots (··) or a couple of slanting lines (//). The handwriting indicates that the same person wielded the pen from the beginning to the end. The book contains four works, all badly done. The scribe is a man from the village of Ming-Tam-Ayil. His name is given indistinctly, but appears to have been Memet Niaz Mullah, the heir of Rehim Mullah. The first part is stated to have been copied in 1297 after the Hegira (1880 A. D.). There are no other dates. The first part occupies the first pages 1—112 and consists of a copy of commentaries on the Persian work *Shahr-i-Gulshān*. The same manuscript is to be found in the library of the University of Uppsala, No. 597, section 7 (Nov. 340). The table of contents contains 22 chapters as against 21 in the Uppsala copy. The headings of the chapters are altered here and there, and further on the copyist has not even observed his own table of contents.

The second part is written on the next 10 pages and represents a brief *tāzkir* of the Imam Djä'färi Sadiq.

The third part of 78 pages consists of the *T ä z k i r ä p a d i s h ä h d j e h ä n* which seems in this case to be a collection from various sources and consequently includes most of the Hodja biographies (see II above).

The fourth part of close on 13 pages is composed of verses written, according to a statement at the beginning of the part, by Memet Niaz. The end is missing, as the last leaf of the book is lost.

Time has not allowed of a detailed examination of this last part, but a hasty review indicates that the contents consist of general religious meditations on life and death with reference to some prophecies. As it is strongly mixed with Persian, it was, no doubt, drawn from some Persian source.

VII

According to a note made by the collector in purchasing this manuscript, its contents represent the history of the Abdal tribe. In reality this is a copy of the *Q ä s s ä s u l - ä n b i j a*, the history of the Prophets, which is common in Eastern Turkestan.

S i z e : The manuscript is stitched and bound in the usual way into a considerable volume, 370×225 mm with a back 75 mm thick.

Binding and edging: The volume is enclosed in stiff cardboard covers, covered with a comparatively thin skin, probably goatskin, which extends in one piece over both covers and back. The pieces of the back corresponding to the parts folded over the edges of the cover, are cut at the top and bottom into fringes of 5 or 6 mm in width. The skin is added in the upper part of the binding and treated as a whole with some kind of bronzing varnish in golden-brown, so that to some extent the binding gives the impression of gilt leather. The joinings are of a redder shade and are now partly tattered, some bits being torn off. The corners are worn and the skin has burst partly at the edges near the back. The cover is approximately flush with the edges. A double-folded, blue and red striped cotton ribbon serves as a capital. The edge, cut by hand, is uneven and bears deep marks of the bookbinder's knife. There is an inscription on the lengthwise edge in black in large letters which reads as follows in translation: »In the year one thousand three hundred and twenty...» The rest is worn away and illegible.

The volume contains four blank leaves at the beginning without any connection with the text and at the end eight leaves, also blank, of which only three are included in the last part of the book.

The paper consists throughout of handmade Khotan paper, mostly well glazed by hand and ruled in the manner of the professional scribes of Eastern Turkestan. The margins are about 50 mm wide.

The writing in black China ink is done with an ordinary reed pen and represents a fairly good mixture of *nesich* and *nestalik*. With a few exceptions it is distinct and legible.

Style and contents: The style is narrative prose throughout with the sole exception of a few verses at the end, reproduced from another source. The actual contents consist of the usual tales of the prophets that occur in the Eastern Turki translations of this work known all over the Mohammedan world. However, some deviations from the usual should be noted: 1) The table of contents, which usually appears at the beginning of other manuscripts of this kind, is given at the end here. 2) The contents of each page are given above the text with one or two exceptions, a method I have not come across before in any Eastern Turki manuscripts. 3) This literary work ends as a rule with the history of Mohammed, presumably for the reason that he was the last of the prophets. The Eastern Turki manuscripts are translations from the Persian, and therefore the Shiite influence has made itself felt here, so that the history of the Caliphs and of Hasan and Husein are also included at the end in the majority of cases. The present work belongs to this category and to this the statement may possibly be due, that the book purports to relate the history of the Abdal tribe, as, according to general tradition, it dates from the unhappy fate of Husein on the banks of the Euphrates. Besides, the copyist reproduces at the end of the book from another source the story of a revelation of Mohammed at Medina through Gabriel, who passed on a prayer for healing and assistance against all kinds of evil. Finally the prayer is reproduced in Arabic.

With regard to the origin of the book approximately the same is said in this manuscript as in the majority of the available copies of this work. Here it is stated that the book existed in the Arabic language, was translated from it into Persian and finally from Persian into

Turki. Its translation into Turki was made by order of the qazi at Rabat-Ayuzi, Nasir ed-din, the son of Burhan ed-din.

If we consider the form of the name Ayuzi, اغبزی, it is evident that this must be due to an error in writing, for this form does not occur anywhere in the numerous manuscripts and printed editions of the same work which I have had an opportunity of examining. Most of them use the form Rabat-γuzi. In one case I came across the form Rabat-'uzi, عبزی, which is, of course, explained by the scribe having omitted the diacritic dot belonging to غ. In some cases translators have stated that they have given their book a title differing from the original, such as Qässäs Rabyuzi (lithographed, Tashkent, A. H. 1335) or Qässäs ar-rabyuzi Uppsala Univ. Libr. Nos. 638 and 639, Nov. 580). Such forms of the title should, of course, be considered a contraction of Rabat-γuzi.

In the present copy the title of the book is given on page 4, line 2 from the bottom, as Q ä s s ä s u l - ä n b i j a. The translator in his modesty suppresses his own name and merely calls himself f ä q i r s h i k e s t e, the poor broken one, but among bibliographers he is known by the name of Rabyuzi or Rabyuzian man, the man from Rabat-γuzi.

In this connection the question arises, what the name Rabat-γuzi refers to. As we know that the Turks of the Oγuz tribe were known by the name of γuz, we seem fairly certainly to be confronted in the combination with the well-known word »rabat» with an etymology which leads to the meaning »the dwelling place of the Oγuzes, the land of the Oγuzes».

The date of the copy is given in the text on page 2, line 8 from the top, as the year 1318 after the Hegira, 1899—1900 A. D. On the last page of the last leaf of the text there is a note stating that it was in the year 1322, on the 13th Muharram, Thursday (March 30th, 1905) that Hodja Ahmad Akhon, the son of Qozi Mullah, certified that he had with his own hand written this Qässäs ul-änbija and made it a *vakf*-donation. This shows that the copyist himself sold the book and thereby, too, himself annulled his *vakf*-stipulation already after little more than a year and ten months, for the manuscript was sold to Baron Mannerheim in Dezember 1906 by this same man Hodja Ahmad.

Finally, an examination of this MS brings out a point that should not be passed over without mention. On the two first leaves and on the last there are various notes and examples of penmanship. All these are of no particular importance, but among all these untidy scrawls one cannot help noting two drawings, rather badly made in red ink, of rectangular figures overlapping each other, as something to linger over.

These figures may possibly be the result of an attempt by an untrained hand to draw a plan of some place. From this point of view our thoughts go to the holy Kaba territory in Mecca, for a careful observer can find several points of comparison in that part. But another interpretation is also possible. Knowing the wealth of ancient shamanistic ideas that still exist among the people of Eastern Turkestan, more or less intimately connected with the religious conceptions of Islam, the impression is very natural that in this case we have a remnant of shamanism with a magic purpose. The figures are strikingly reminiscent of the so-called gates that used to be drawn in shaman ritual in order to confine the spirits. One of the drawings has wing-like projections, possibly to indicate the points of the compass.

These gates are described in detail by MAGNUS OLSEN in *Maal og Minde*, 1916. DAG STRÖMBECK has dealt with the same subject in his work *Scjd*, p. 125 sq., where he quotes Olsen's description in an abbreviated form.

There are similar drawings, too, inside the cover of the MS described above under I.

It must be left to the ethnographers to decide, whether the latter theory is justified or not.

VIII

The following note by the collector is made on a scrap of paper inside the cover: »Täzkir from the mazaar with the tomb of Divana Khan Khoddjam in the village of Hangui, east of Khotan. Bought from the mullah».

Description: 370 × 295 mm, edge beyond cover 27 mm. Stitched with twisted cotton thread. The book was probably bound at one time in the present loose cover of brown leather with thick covers of Khotan paper gummed together. The first leaf with the beginning of the book is extant and apparently the leaf that was originally the last is also preserved. The paper is very strong, even and carefully glazed Khotan paper. Here and there deep traces of the usual method of ruling in Eastern Turkestan are visible, while in other places there are no traces of ruling whatever. The manuscript has suffered a good deal of damage from water and is therefore badly damaged in its upper part, the writing being obliterated and parts of the sheets having been worn away. The writing in black China ink is done with an ordinary reed pen in a very mixed and illegible handwriting, done by several more or less inefficient scribes.

The contents are in narrative prose throughout and relate, in Eastern Turki greatly mixed with Persian and Arabic, a wellknown extremely fantastic story, translated from Arabic to Persian and from the latter into Eastern Turki, about Hasan and Husein, the sons of Ali and Fatima, and especially about the martyrdom of Husein. The title of the book is given in various places as follows: This book has been called Emir Museijeb Ghazi. And as a matter of fact it is a museijebnāme written by hand, rather a rare find. It occurs, however, in lithographic print and its contents are described in their main features by M. HARTMANN (*Mitteilungen Sem. Orient. Sprachen VII, 1904, Part II, p. 80*).

The present narrative, however, omits the whole previous history described by HARTMANN and plunges after a couple of general phrases straight into Hussein's martyrdom and then only mentions that the book was written »since 846 years had passed after the holy man's death of martyrdom in the following 47th year». As Hussein's death at Kerbela occurred in 680, A. H. 61—62, the original must have been written in the year 909 after the Hegira, 1503 A. D. According to an indistinct note on the last line but one of the last page, the present Eastern Turki manuscript was completed in the 131st year. Here the thousand has obviously been omitted in stating the year, so that it should be understood to be A. H. 1131, 1718—19 A. D. This date is undoubtedly correct in regard to the translation into Eastern Turki, as it was at that very time that the Shiite descendants of the Prophet were gaining ground in the country round Tarim. On the other hand it is improbable

that the present copy is to be referred to that time, but there is no other information regarding the date of its coming into being. An indistinct note at the end indicates that the name of the scribe was Tokhta Khälfäm.

In this case, therefore, there is no more evidence than in the previous documents in favour of the historical connection of the Abdal tradition with the events at Kerbela in 680, a circumstance that has no great likelihood of being ever proved from other sources. (See RAQUETTE, G., *Muhammeds Religion*, Stockholm 1935, p. 71 sq.)

A CONTRIBUTION TO THE
PHYSICAL ANTHROPOLOGY OF SOME PEOPLES
IN CENTRAL ASIA

BASED ON RECORDS COLLECTED BY C. G. MANNERHEIM

BY
KAARLO HILDÉN

I. MATERIALS AND METHODS OF INVESTIGATION.

The anthropological materials collected by Baron MANNERHEIM during his journey across Asia in 1906—08 embrace 165 individuals, all of whom are males. They are distributed among the following tribes:

Abdals	17 individuals
Shiksho	8 »
Pakhpo	4 »
Dolans or Tulans	9 »
Kalmuks	37 »
Kirghiz	28 »
Torguts	50 »
Yögurs	12 »

The materials are not extensive and are, besides, unevenly distributed, but as they refer to tribes and peoples, of whom we have only scanty anthropological information or none at all, a compilation of these observations and measurements should be worth publishing.

The technique in taking anthropological measurements and the methods of observation vary, of course, to a large extent. At the beginning of the present century this was the case in an even greater degree than at present. In view of this it seems appropriate to describe the methods which MANNERHEIM adopted.

The observations and measurements are shown in the following table:

Date		Name			Profession			Sex		General condition	
								Age			
Tribe				Language or dialect				Remarks			
Locality											
a. Colour of skin on parts not exposed to the air.		b. Colour of eyes.		c. Fold of skin at inner angle of eye.		d. Colour of hair.		e. Character of hair.		f. Amount of hair (on the face) (on the body)	
g. Shape of face.		h. Profile of nose.		i. Prognathism or prominence of the face in the region of the mouth.		j. Lips.		k. Prominence or flatness of face.		l. Maximum length of head.	
2	3	4	5	6	7	8	9	9 a.	10		
Maximum breadth of head.	Length of nose from base to root.	Breadth of nose across nostrils.	Projections from vertex to root of nose.	Projections of head from vertex to chin.	Head from vertex to tragus of ear.	Bizygomatic breadth of face.	Face length from the nasion to chin (under surface).	Length of upper limb.			
11	12	13	14	15	16	17	18	19	20		
Length of cupit.	Length of the hand along its back.	Length of the foot.	Sitting height.	Kneeling height.	Standing height (without shoes).	Height to chin.	Height to sternal notch.	Height from internal malleolus to the ground.	Span of arms.		

In the observations and measurements the instructions contained in »Notes and Queries on Anthropology» edited by JOHN GEORGE GARSON, M.D. and CHARLES HERCULES READ, F.S.A. (1892) were followed, their main features being given below.

a. Colour of skin on parts not exposed to the air:

Black	....	{ Absolute	.....	1	Yellow	.....	6	
		{ Sooty	.....	2		{ Yellowish	.....	7
Brown	{ Reddish	3	White	..	{ Brownish	8
		{ Yellowish	.....	4		{ Pale	.....	9
Red	.....			5		{ Rosy	.....	10

b. Colour of eyes:

Dark of all shades	.....			1
Medium ..	{ All medium shades ex. green	.....		2
	{ Green	.....		3
Light	{ All light shades ex. blue	.....		4
	{ Blue	.....		5

c. Fold of skin at inner angle of eye:

- (0) Absent; (1) Vestige remaining; (2) Covering a third to a half the caruncle;
- (3) Covering the caruncle.

d. Colour of hair:

- (1) Black; (2) Dark brown; (3) Medium; (4) Blond or fair of all shades; (5) Red.

e. Character of hair:

- (1) Straight; (2) Undulating or wavy; (3) Curly; (4) Woolly.

f. Amount of hair, I) on the face; II) on the body:

- (1) Absent; (1) Scarce; (2) Medium; (3) Abundant.

g. Shape of face:

- (1) Long and narrow; (2) Medium; (3) Short and broad; (4) Pyramidal, *i.e.* narrowing upwards; (5) Wedge-shaped, *i.e.* pointed towards chin.

h. Profile of nose:

- (1) Straight; (2) Aquiline; (3) Concave or turned-up; (4) High bridged; (5) Sinuous or wavy; (6) Chinese type; (7) Negroid type; (8) Australoid type.

- i. Prognathism or prominence of the region of the mouth:
 (0) Absent; (1) Slight; (2) Moderately marked; (3) Considerable.
- j. Lips: (1) Thin; (2) Medium; (3) Thick; (4) Everted.
- k. Prominence of face transversely:
- | | | | | |
|---|---|--------------|-------|---|
| Proprosopic (face prominent, cheek bones not perceptible) | } | Considerable | ..... | 1 |
| | | Moderate | ..... | 2 |
| Mesoprosopic |  |  | ..... | 3 |
| Platyprosopic (face flat, cheek bones conspicuous) | } | Well marked | ..... | 5 |
| | | Excessive | ..... | 5 |
1. Maximum length of head: »Measured from the most prominent point in the middle of the brow between the eyebrows, the glabella, to the most prominent point in the middle of the occiput or back of head. It is the maximum length of the head in the middle line. In unsymmetrical heads the line of greatest length may be on one or other side of the middle line, such a length must not be taken.»
 2. Transverse breadth: »The maximum breadth of the head wherever it may be (except low down behind the ears) measured transversely to the length. The points of the instrument must be exactly on the same level, otherwise the measurement will not be truly transverse, both in relation to the length and the horizontal plane.»
 3. Length of nose: »In making this measurement the instrument is held vertically, its lowest point is placed lightly against the furthest back point of the under surface of the septum between the nostrils, where the upper lip begins, the upper point at the termination or root of the nose between the eyes; this is sometimes a little difficult to determine. There is a small transverse fold of the skin (sometimes two folds) at the root of the nose; it is on this fold, or when there are two folds, between the folds, that the upper point of the instrument should rest, generally about two mm. above the level of the transverse axes of the eyes.»
 4. Breadth of nose: »Measured across the widest part without compressing the nostrils between the points of the instrument.»
 - 5—8. Projections of head: »The subject must sit with the body upright and the head straight, the line of vision directed horizontally forwards to a point a little distance off, the same height as the eyes.»
 5. Vertex to root of nose: »The point on the root of the nose to which this measurement is taken is the same as that in measuring the length of the nose.»
 6. Vertex to mouth: »The lower point is the line of the lips when closed.»
 7. Vertex to chin: »The point on the chin is that corresponding to the under surface of the lower jaw.»
 8. Vertex to tragus of ear or supra-auricular projection, is measured by rotating the instrument to the side of the head, the horizontal arm still resting on the vertex. The lower arm is projected against the middle of the tragus, at the point where it starts from the side of the face.»
 9. Bizygomatic breadth of face »is the maximum breadth of the face between the bony arches in front of the ears.»
 10. Length of upper limb: »This is measured with the arms straightened and hanging vertically at the sides of the body. The right arm should be selected for measurement unless both arms are measured. The point of the sliding arm of the instrument is applied to the depression which is found immediately below the bony prominence forming the tip of the shoulder, the acromion, between it and the head of the humerus or armbone, the other arm of the instrument is drawn downwards until it reaches the extreme end of the middle finger. While making the measurement the instrument must be held parallel to the axis of the limb; to do this its lower arm must be moved horizontally till it projects the requisite distance beyond the other as in taking the projections of the head.»
 11. Length of cubit: »The forearm is fully flexed upon the upper arm till the tip of the elbow is the most prominent point, the thumb being uppermost. The instrument is then placed along the outer edge of the forearm and the little-finger side of the hand, the point of the elbow resting against the fixed arm of the instrument, while its other arm (which has been previously drawn along the rod) is moved backwards again till it touches the end of the middle finger.»

12. Length of hand: »With the forefinger and the thumb find extremities or styloid processes of the forearm, situated on the thumb and little-finger sides of the subject's wrist, and tie a small cord over them, so as to show their line of junction. The length of the hand is measured from the centre of this line along the back to the tip of the middle finger.»
13. Length of foot: »Measured in the same manner as the shoemaker does for a boot.»
14. Sitting height: »The subject should be seated low. Care must be taken to see that the body is held perfectly erect, the head in the same position as when measuring its projections, and the legs should be close together. The measurement is taken between the vertex and the plane of the tuberosities of the ischia, or bony prominences of the buttock.»
15. Kneeling height: »The subject kneels down, holding his body erect and head straight. The legs should be close together, and the point of the toes as nearly as possible on the same plane as the knee. Should the subject object to kneel properly, the height of the lower edge of the patella, or knee-cap, from the ground may be taken instead before measuring No. 19.»
16. Standing height: »This should always be measured without shoes, when possible. Should the subject object to take off his shoes, he may be measured with them on, and the thickness of the heel deducted.»
17. Height to chin: »is measured from the ground to the under surface of the lower jaw, the point at which the projection of the head to the chin ceased. While making this measurement care must be taken that the head is held straight, as in measuring the projections.»
18. Height to the sternal notch: »The upper point of measurement is in the middle line of the body, on the upper edge of the sternum, midway between the projecting ends of the collar-bones.»
19. Malleolar height: »Measured from the tip to the internal malleolus (or downward projecting process of the large leg bone) to the ground, by sliding down the horizontal arm of the instrument to the level of the point of the malleolus.»
20. Span of arms: »The arms must be extended horizontally so that their axes are at right angles to the axis of the body, the palms directed forwards, the measuring rod is placed across the subject's back, *not* in front of the chest, and the maximum distance from the tip of the middle finger of one hand to that of the other with the arms extended is measured. This measurement is best made when the subject is standing with his back and arms resting against a wall.»

As this list shows, the individuals were examined in a varied and minute manner. It is therefore easily intelligible that — as MANNERHEIM mentions in his diary (p. 109) — »each individual takes quite half-an-hour». In such circumstances it is also comprehensible that in spite of the appreciable time sacrificed to anthropological observations and measurements the number of individuals was fairly small.

II. ABDALS.

On December 6th, 1906, in the village of Tamaghil in the neighbourhood of Khotan MANNERHEIM came in touch with the very interesting beggar tribe, of the fortunes and life of which he gives a description in his diary (pp. 92—93). Later, on December 28th, 1906, he had an opportunity of studying the Abdals in the village of Hayran Bagh in the Yarkand district and on January 28th—30th, 1907, in the village of Painap in the Kashgar district.

In regard to the origin, fortunes, life and customs of the Abdals the reader is referred

to the diary (pp. 92—93, 110 and 114—115) and to Dr. G. RAQUETTE's investigation¹ included in the present work. I will only mention here that according to Mohammedan tradition the Abdals were originally domiciled in the Turkish Empire, whence they spread to Western Asia, where they now live in small colonies in Eastern Turkestan, Persia and India. They obtain their livelihood to a great extent by professional mendicancy.

The number of Abdals examined was 17. Of these 6 came from the village of Hayran Bagh in the neighbourhood of Yarkand, 11 from the village of Painap in the Kashgar district. According to MANNERHEIM's notes 6 of the examined individuals were agriculturists (all from Hayran Bagh), 6 were mendicants, 3 merchants, 1 an artisan and 1 a cook, all males. The majority, 16 individuals, were of an actual anthropological age, from 25 to 55, only 1 being younger, 20.

On the basis of the small number of individuals it is, of course, impossible to give even an approximately exhaustive idea of the physical properties of the Abdal tribe, but as no anthropological investigations whatever have been published before concerning the Abdals, as far as I know, the following synopsis may be of interest.

General condition. The condition of the body is thin or fairly thin. Of the individuals 8 belong to type 3 (thin), 8 to type 2 and 1 to type 1—2.

The *colour of the skin* is generally fair: rosy (type 10) or pale (type 9) in 16 individuals; it is yellowish (type 7) only in 1 individual (the youth of 20).

The *colour of the eyes* is dark in the majority or 13 individuals, medium in 4 individuals; all the latter come from the village of Painap.

The *Mongolian fold* or the »fold of skin at inner angle of eye» did not occur in any of the individuals examined.

The *colour of the hair* is very dark: black in 15 individuals, dark brown in 2.

The *character of the hair* is straight in all the individuals examined.

The *amount of hair* on the face is abundant (type 3) in 5 individuals, medium (type 2) in 4, scarce (type 1) in 7, absent (type 0) in 1 (the youth of 20). — The *amount of hair on the body* is abundant in 2 individuals, medium in 2, scarce in 10, absent in 3.

The *shape of the face* varies: long and narrow in 3 individuals, medium in 4, short and broad in 8, wedge shaped, i.e. pointed toward chin, in 2.

The *profile of the nose* is straight in the majority or 12 individuals; in 3 individuals it is slightly aquiline (1—2 or 1—4), distinctly aquiline in 2.

The *prominence of the region of the mouth* is little developed: in 6 individuals »absent», in 8 slight, in 3 (all from Hayran Bagh) moderately marked.

The *lips* are thin in 6 individuals, medium in 11.

Concerning the *prominence of the face transversely* there are the following notes: face moderately prominent (cheek-bones not perceptible) in 4 individuals, face mesoprosopic in 6, face flat (cheek-bones well marked) in 7.

The *size and shape of the head* vary very much.

The *maximum length of head* is illustrated by the following figures: $M \pm m = 183.71 \pm 2.03$ mm, Min. 165 mm, Max. 204 mm, $\sigma = 8.98$, $v = 4.56$. The variability is also seen in the following table:



Fig. 1 and 2. *Abdal Khodja Akhmet*, aged 50.

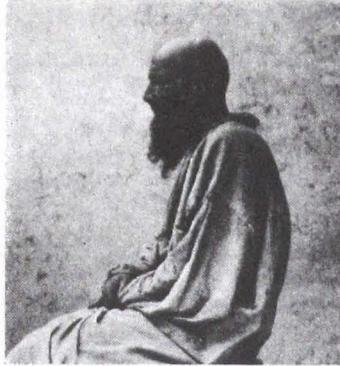


Fig. 3 and 4. *Abdal Mullah Aysah*, aged 48.



Fig. 5 and 6. *Abdal Timur*, aged 46.



Fig. 7 and 8. *Abdal Mamet*, aged 30.



Fig. 9 and 10. *Abdal Saydullah*,
aged 20.

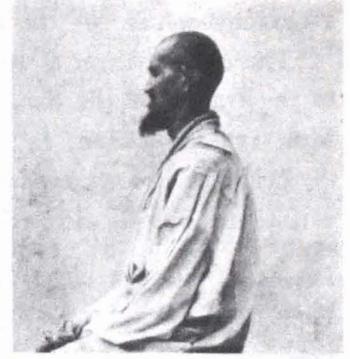


Fig. 11 and 12. *Abdal Sandja*,
aged 40.



Fig. 13. *Abdal Khodji Akhmet*,
aged 34.

Fig. 14. *Abdal Abut Funut*.

165—169.9 mm	.....	1 individual	185—189.9 mm	.....	4 individuals
170—174.9 »	.....	1 »	190—194.9 »	.....	3 »
175—179.9 »	.....	3 »	195—199.9 »	.....	— »
180—184.9 »	.....	4 »	200—x »	.....	1 »

The *maximum breadth of head* also displays very varying values: $M \pm m = 150.12 \pm 1.46$ mm, Min. 137 mm, Max. 159 mm, $\sigma = 6.01$, $v = 4.00$. If we divide the materials into 5 cm groups, we obtain the following table:

x —139.9 mm	.....	2 individuals	150—154.9 mm	.....	4 individuals
140—144.9 »	.....	— »	155—159.9 »	.....	4 »
145—149.9 »	.....	7 »			

If we calculate the *cephalic index* on the basis of the absolute diameters, we obtain the following general values: $M_{\pm m} = 81.75 \pm 0.76$, Min. 75.49, Max. 87.85, $\sigma = 3.12$, $v = 3.82$. According to the mean, therefore, the Abdals are brachycephalic. The mean is, however, very little instructive in this case, as is evident quite obviously from the division of the individuals examined into the established index groups:

dolichocephalic (index $x < 75.9$) 1 individual
 mesocephalic (» 76.0—80.9) 7 »
 brachycephalic (» 81.0— x) 9 »

Of the brachycephalics 2 individuals are hyperbrachycephalic with an index above 85.5. Evidently it is scarcely possible to describe the examined Abdals even on the whole as brachycephalic — the degree of variation is very great.

The *absolute height of the head* is illustrated by the projective measure from the vertex to the tragus of the ear. Its general values are as follows: $M_{\pm m} = 127.82 \pm 2.08$ mm, Min. 115 mm, Max. 147 mm, $\sigma = 8.57$, $v = 6.70$. According to this the variability of the height is also very considerable — one need only consider the value of the coefficient of variation. This is also evident from the following table:

115—119.9 mm	.....	3 individuals	135—139.9 mm	.....	2 individuals
120—124.9 »	.....	3 »	140—144.9 »	.....	1 »
125—129.9 »	.....	6 »	145— x »	.....	1 »
130—134.9 »	.....	1 »			

In view of the great degree of variation of the absolute diameters it is natural that the height-length and height-breadth indices, which give an idea of the relative height conditions of the head, should also supply very varying values.

Height-length index: $M_{\pm m} = 69.62 \pm 1.04$, Min. 60.7, Max. 77.3, $\sigma = 4.28$, $v = 6.15$.

Height-breadth index: $M_{\pm m} = 85.1 \pm 1.18$, Min. 76.3, Max. 94.2, $\sigma = 4.86$, $v = 5.71$.

According to the conventional index limits we have in the materials according to the height-length index

orthocephalic (index 57.7—62.5) 1 individual
 hypsicephalic (» 62.6— x) 16 »

according to the height-breadth index

tapeinocephalic (index $x < 78.9$) 3 individuals
 metriocephalic (» 79.0—84.9) 5 »
 acrocephalic (» 85.0— x) 9 »

As regards the height-length index the measured Abdals are thus almost entirely hypsicephalic. As regards the height-breadth index, however, which is generally more likely to express the height conditions of the head in a better way, all the groups are represented. Acrocephaly does, indeed, occur very generally, but only slightly over half of the measured individuals belong to this group. We can merely say that, according to our materials, the head among the Abdals is on the whole high or comparatively high.

The *size and shape of the face* are illustrated by the bizygomatic breadth and the total facial height, from the nasion to the chin, and their relation to each other.

The *bizygomatic breadth of the face* is in general very considerable: $M \pm m = 142.00 \pm 1.26$ mm, Min. 133 mm, Max. 154 mm, $\sigma = 5.18$, $v = 3.65$.

The *facial height* records the following values: $M \pm m = 115.88 \pm 1.03$ mm, Min. 102 mm, Max. 132 mm, $\sigma = 7.86$, $v = 6.87$.

The *facial index* calculated on the basis of the absolute values is as follows: $M \pm m = 81.59 \pm 1.08$, Min. 74.1, Max. 88.6, $\sigma = 4.46$, $v = 5.47$. The variability, it will be noted, is also remarkably large in regard to this character. If we divide the materials into the conventional groups, we obtain the following table:

hypereuryprosopic (index $x - 78.0$)	5	individuals
euryprosopic (» 79.0—83.9)	5	»
mesoprosopic (» 84.0—87.9)	6	»
leptoprosopic (» 88.0—92.9)	1	»

Euryprosopy, in which group the mean is situated, is in reality not particularly characteristic of the Abdals.

The *nasal height* or »the length of nose from base to root» is as follows: $M \pm m = 47.35 \pm 1.04$ mm, Min. 40 mm, Max. 54 mm, $\sigma = 4.28$, $v = 9.04$.

The *nasal breadth* across nostrils is as follows: $M \pm m = 36.53 \pm 0.71$ mm, Min. 31 mm, Max. 43 mm, $\sigma = 2.94$, $v = 8.05$.

The *nasal index* calculated on the basis of the absolute measurements supplies the following values: $M \pm m = 77.47 \pm 1.82$, Min. 61.1, Max. 88.4, $\sigma = 7.48$, $v = 9.65$. The division of the nasal index into the established groups is as follows:

leptorrhine (index 55.0—69.9)	2	individuals
mesorrhine (» 70.0—84.9)	12	»
chamaerrhine (» 85.0—99.9)	3	»

Thus both the nasal dimensions and the nasal index vary very much — to a still higher degree than other metric characters. Mesorrhinism is the most generally prevalent form.

Stature and proportions of body. The following table illustrates the proportions of the body and their variability.

	$M \pm m$	Var.	σ	v
Standing height	163.12 \pm 1.78	149.7—179.0	7.32	4.40
Height to sternal notch	132.39 \pm 1.50	121.8—146.7	6.18	4.67
Length of upper limb	73.63 \pm 1.09	66.9—85.7	4.50	6.11
Length of cubit	45.43 \pm 0.70	40.3—51.6	2.87	6.32
Length of hand	17.86 \pm 0.51	16.3—23.1	2.09	11.68
Length of foot	23.73 \pm 0.48	18.4—26.0	2.02	8.32
Sitting height	85.80 \pm 0.96	79.0—91.9	3.94	4.59
Span of arms	165.31 \pm 2.36	150.0—187.0	9.80	5.91

The *stature* is thus very variable. In order to make this circumstance still clearer we divide the materials into 5 cm groups and obtain the following values:

x —149.9	1 individual	165.0—169.9	5 individuals
150.0—154.9	2 »	170.0—174.9	1 »
155.0—159.9	3 »	175.0— x	1 »
160.0—164.9	4 »		

Judging by the available materials, the male stature among the Abdals varies mostly between the limits of 160 and 170 cm. Short individuals are, however, fairly numerous, whereas really tall individuals are rare.

The *proportions of body* display great individual variability. The sitting height is on an average 52.6 % of the stature, min. 48.4, max. 56.4 %. If we subtract the sitting height from the stature and describe the rest as the length of the lower limbs, the latter is on an average 47.4 % of the stature, min. 45.6, max. 51.6 %; this proportionate figure is only above 50 in two cases (51.0 and 51.6 % respectively), in all the other measured cases it is below 50. The relative length of the upper limbs is very considerable, on an average 45.1, min. 43.5 (the youth of 20), max. 48.8. The relative length of the hand is on an average 10.97, the relative length of the foot 14.5; the variability, however, is very considerable as regards these dimensions. The span of the arms is in most cases slightly greater than the stature, it being slightly less only in 6 individuals.

On the basis of our materials, scanty, it is true, the Abdals are a very heterogeneous population from an anthropological point of view. The average coefficient of variation for 12 measurements and indices of the head is 5.96, for 8 measurements of the body mentioned above 6.54, for all 20 characters 6.19. However, a detailed racial analysis is impossible for natural reasons. In any case it is evident — judging both by the observations and measurements referred to above and by the illustrations reproduced — that the Abdals cannot at all be referred to the Mongolide race, although they probably received some influences from this quarter (see, e.g., fig. 9—10, the youth of 20). Undoubtedly various Europide racial elements constitute the framework of the Abdal tribe. Probably — to use VON EICKSTEDT'S² terminology — the Orientalide and Armenide races, possibly with an admixture of the Turanide race, are principally concerned in this case. It is indicative and quite comprehensible in view of the foregoing that fairly pronounced »Jewish« types should occur among the Abdals (see, e.g., fig. 3—4 and 5—6). If we assume the tradition, according to which the Abdals originally came from Turkey and spread eastwards in the course of the centuries, to be correct, their anthropology would also reflect the fortunes that the tribe had experienced. The great variability that characterises the Abdals would also be quite comprehensible by this means.

III. PAKHPO AND SHIKSHO.

During his stay at Karghalik at the end of December, 1906, MANNERHEIM got into touch with the little known hill tribes of Pakhpo and Shiksho living on the river Tiznaf,

Fig. 15 and 16. *Pakhpo Mullah Akhum, aged 35.*

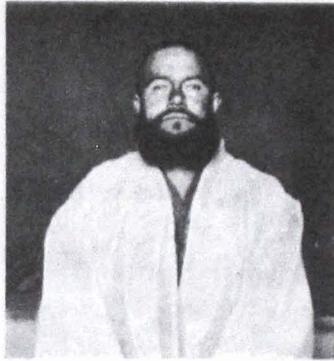


Fig. 17 and 18. *Pakhpo Akhbay, aged 20.*

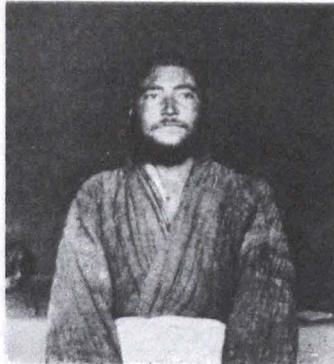


Fig. 19 and 20. *Pakhpo Imail Akhum, aged 49.*



Fig. 21 and 22. *Pakhpo Kabil, aged 50.*



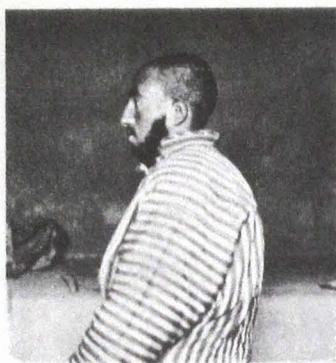


Fig. 23 and 24. *Shiksho Tokhto*,
aged 20.

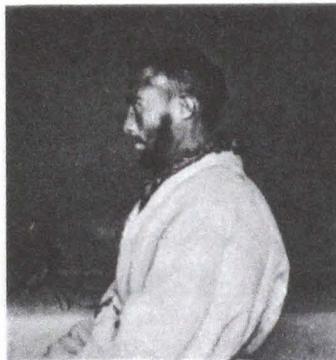


Fig. 25 and 26. *Shiksho Tokhta-
bai*, aged 26.



Fig. 27 and 28. *Shiksho Yaveg*,
aged 40.

the former on the lower course of the river, the latter higher up. MANNERHEIM gives some particulars of the living conditions, language, dress etc. of both tribes in his diary (pp. 108—109).

While staying at Karghalik MANNERHEIM had an opportunity on December 20th, 1906, of examining 12 individuals of these tribes anthropologically, who were fetched from the hills at his request. Of the individuals examined 4 belonged to the Pakhpo and 8 to the Shiksho tribe. Practically all of them were farmers; one of the Pakhpos is described as a shepherd and one of the Shikshos as a trader.

As far as I know, there are no anthropological investigations in existence regarding the Shiksho tribe. Among the Pakhpo tribe Sir AUREL STEIN examined 25 individuals

during his journey in 1906—08 in the mountains which fringe the southwestern portion of the Taklamakan desert. These observations were made use of by T. A. JOYCE in his notes on the the physical anthropology of Chinese Turkestan and the Pamirs³ and later by G. M. MORANT in his comparative investigations into the anthropology of Central Asia.⁴

As the number of individuals examined in MANNERHEIM's series is very small, it is not worth while entering into a detailed synopsis of the materials, the more so as for some reason the records of the measurements are so incomplete that they cannot be used.

The descriptive characters only appear in the individual tables. According to these the colour of the skin among the *Pakhpos* is pale, the colour of the eyes is dark of various shades, the eyes are without the Mongolian fold or only with «traces» of it, the colour of the hair is black, the hair is straight, the amount of hair both on the face and on the body is abundant, the face is mostly broad or fairly broad, the nose is generally straight and the lips of medium thickness. — The *Shikshos* seem to resemble the *Pakhpos* to a great extent. According to the notes the colour of the skin is pale or rosy among them, the colour of the eyes generally brown, the eyes are without the Mongolian fold, the colour of hair is black, the hair straight, the amount of hair on the face is abundant or medium, but on the body often scarce, the face broad or fairly broad, in some cases flat, the nose generally straight, occasionally sinuous and the lips of medium thickness.

From these indications it is evident that the *Pakhpos* and *Shikshos* do not correspond to the Mongolide type. Their general appearance, as seen in the accompanying illustrations, is not at all Mongoloid, nor does it correspond to the type that is usually described as Turanide. It is more than vain, however, to express an opinion on the racial composition of the tribes on the basis of our limited materials, but it seems certain that they consist principally of Europide racial elements.

IV. DOLANS OR TULANS.

On February 8th and 9th, 1907, when MANNERHEIM was at Maral Bashi, anthropological investigations were made among the local population which consists of Dolans or «Tulan» as they themselves pronounce the name (see Diary, p. 124). A description of their general conditions of life is given in the diary (pp. 124—127), to which the reader is referred.

During his journey of exploration in 1906—08 Sir AUREL STEIN made a number of measurements, referring to 16 individuals, in the same neighbourhood as MANNERHEIM; the results were made use of partly by T. A. JOYCE in his investigations concerning the differential index in some tribes of Chinese Turkestan and the Pamirs.⁵ No general characterisation of the Dolans is given, however, in JOYCE's work. There do not appear to be any other anthropological investigations concerning this tribe.

The Dolans whom MANNERHEIM examined are, unfortunately, very few in numbers: only 9 male individuals between the ages of 18 and 46, all of them farmers by profession. However, in spite of the paucity of the materials — in view of the anthropology of the Dolans being known very imperfectly — a short synopsis of the observations should not be out of place.

The *general condition* is noted in all cases as medium. In his diary (p. 126) MANNERHEIM says in speaking of the Dolans: »They are in good condition, being sufficiently fed».

The *colour of the skin* is white, yellowish or pale. MANNERHEIM mentions (p. 127) that »the Dolans are fairer than the Sarts».

The *colour of the eyes* is dark or medium.

The *Mongolian fold* does not occur.

The *hair* is black in colour, in the case of 1 individual it is put down as dark brown; the character of the hair is straight in all cases.

The *amount of hair on the face* is usually medium, occasionally scarce, sometimes abundant; *hair on the body* is usually absent.

The *shape of the face* varies.

The *profile of the nose* is usually, though not always, straight.

The *prominence of the region of the mouth* is mostly slight, in some cases moderately marked.

The *lips* are in almost all cases of medium thickness, in 1 individual they are described as thick.

Prominence of face: in most of the individuals examined the face is flat with well marked cheek-bones; in 1 individual the platyoprosopy is described as excessive, in 1 individual the face is mesoprosopic. MANNERHEIM says in his diary (p. 125) that »the cheek-bones are fairly prominent, but their faces are far from ugly».

Concerning the measurements of the head the following mean values with the minima and maxima are given:

Head length 186.78 (177—203) mm.

Head breadth 157.89 (147—164) mm.

Head height from vertex to tragus; of ear 126.67 (112—134) mm.

The variability is thus considerable. This refers equally to the indices of the head:

Breadth-length index: $M \pm m = 84.77 \pm 1.94$, var. 75.77—92.13, $\sigma = 5.83$, $v = 6.87$

Height-length index: $M \pm m = 66.85 \pm 1.37$, var. 62.56—75.28, $\sigma = 4.12$, $v = 6.17$.

Length-breadth index: $M \pm m = 79.01 \pm 1.35$, var. 68.71—82.99, $\sigma = 4.10$, $v = 5.16$.

According to the cephalic index the materials contain 2 dolichocephalic, 4 brachycephalic and 3 hyperbrachycephalic individuals. — According to the height-length index all the individuals examined are hypsiccephalic, though 4 of them are very near to orthocephaly. — According to the height-breadth index there are in the materials 4 tapeinocephalic and 5 acrocephalic individuals.

The face, too, is very variable in its measurements.

The *bizygomatic breadth of the face* is 145.56 (134—153) mm.

The *total facial height* is 122.22 (117—126) mm.

The values of the *facial index* are as follows: $M \pm m = 83.39 \pm 1.20$, var. 77.79—90.80, $\sigma = 3.61$, $v = 4.33$. Of the individuals examined 1 is hypereuryprosopic, 5 europrosopic, 2 mesoprosopic and 1 leptoprosopic — rather a mixed collection.

The nasal dimensions vary to a still greater degree. The mean *nasal height* is 53.78 (45—59) mm, the *nasal breadth* 38.67 (34—43) mm. The values of the *nasal index* are as

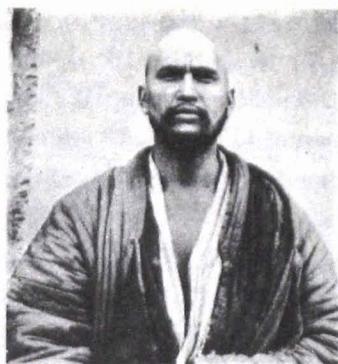


Fig. 29 and 30. *Dolan Madullakh*, aged 27.



Fig. 31 and 32. *Dolan Abdullah*, aged 20.

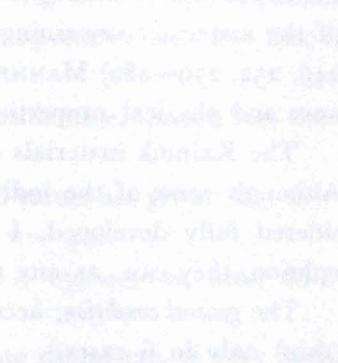


Fig. 33. *Dolan Saidakhum*, aged 40.

follows: $M \pm m = 72.22 \pm 1.88$, var. 65.38—82.22, $\sigma = 5.65$, $v = 7.82$. Of the individuals examined 4 are leptorrhine and 5 mesorrhine.

Of the *body measurements* the following absolute and relative figures can be mentioned (the measurements of the 18-year old are not included):

Stature 167.44 (153.6—173.7) cm.

The absolute length of the *upper limbs* is 74.88 (68.8—80.9) cm, the relative length 44.72 %.

The absolute *sitting height* is 85.35 (80.1—90.6) cm, relative 50.97 %.

The absolute *length of the lower limbs* is 82.01 (73.2—85.4) cm, relative 49.03 %.

The absolute *length of the hand* is 18.35 (16.5—19.8) cm, relative 10.96 %.

The absolute *length of the foot* is 24.52 (20.7—26.4) cm, relative 14.65 %.

The absolute *span of arms* is 171.00 (152.0—182.1) cm, relative 102.48 %.

The following observations from MANNERHEIM's diary (p. 125) may be quoted as a supplement to these measurements: »The Dolans seem to be taller than the Sarts. — Their hands and feet are well shaped, their fingers are long and narrow, the second toe is longer than the big toe.»

A comparison between the means given above and those mentioned by JOYCE shows that there is very considerable conformity. The greatest divergences refer to the nasal dimensions (according to JOYCE the mean height is 51.19 ± 0.62 , breadth 39.94 ± 0.51) and consequently to the nasal index (78.19 ± 1.42), as well as the length of the face (117.12 ± 1.19) and the facial index (80.50 ± 0.97); the hair quality is described as wavy and not as straight. These dissimilarities are probably due for the greater part to the fact that both the series are very small, so that accidental circumstances play an important part. Finally, it should be mentioned that according to »the differential index», which JOYCE calculated on the basis of STEIN's materials, »the Dolan, Kelpin and Kirghiz form a closely related group» (p. 459).

V. KALMUKS.

The Kalmuks (Oirats) who were examined belong to the Surgan summum and come from different places round the river Tekes to the east of Qulja. The investigations were made principally during the last days of May, 1907, at the same time as the greater part of the materials concerning the Kirghiz, dealt with later, was collected. In his diary (pp. 249, 252, 279—280) MANNERHEIM provides some interesting information about the appearance and physical properties of the Kalmuks, to which I refer the reader.

The Kalmuk materials embrace 37 male individuals, whose age varies from 19 to 51. Although some of the individuals are rather too young — 1 is 19, 2 are 20 — to be considered fully developed, I have included them, too, in the following synopsis, as, in my opinion, they can, at any rate to a great extent, be described as »adult».

The *general condition*, according to the notes, is of type 2 (medium) in 31 cases, of type 3 (thin) only in 6 cases.

The *skin colour* is in the majority or 23 cases brownish (type 8), in 4 cases it is described as pale (type 9), in 4 as rosy (type 10), while in the rest the colour is rosy (3 individuals), pale-rosy (2 individuals) or brownish-pale (1 individual).

The *eye colour* is in general dark. Of those examined 27 individuals are described as dark-eyed, while 9 have intermediate shades (»all medium shades except green») and 1 individual bears the description 1—2.

The *Mongolian fold* occurs generally. In 18 individuals it covers a third to a half of the caruncle, in 6 cases it covers the caruncle entirely, in 9 cases there are traces of the fold. In only 4 individuals (10.8 %) the fold is described as absent; all these are over 40 years of age. In his diary (p. 280) MANNERHEIM writes: »The caruncle in young persons is mostly slightly covered; strange to say, you seldom see this in older people.»⁶

The *hair colour* is black in practically every case. In only one individual the hair is described as dark brown.

The *hair quality* is straight in all the individuals.

The *hair amount* is in general very scarce or practically non-existent. The hair on the body is described in almost all cases (35 individuals) as absent, in 1 case as scarce and in 1 case as medium. The beard is described in 8 cases as absent, in 25 cases as scarce, in 4 cases as medium. MANNERHEIM writes in his diary (p. 279): »Their beards are scraggy and begin to grow late. Up to the age of 25 or 30 their moustaches are scarcely visible. There is seldom any hair on their bodies except in the armpits and groin».

The *shape of the face* is rather varied. The most general shape included in the schedule is type 5, »wedge-shaped, i.e. pointed towards chin»; 17 individuals belong to this type. In 9 individuals the shape is »short and broad» (type 3), in 9 »medium» (type 2), only in 1 »long and narrow» (type 1); 1 individual is noted as 2—5. In his diary (p. 280) MANNERHEIM writes of their faces: »Their chins are pointed, so that their heads, which are frequently broad, form a triangle with the point at the bottom».

The *profile of the nose* is varied — I refer the reader to the individual tables in this connection. In his diary (p. 279) MANNERHEIM writes: »Their noses are mostly small and well-shaped».

The *prominence of the region of the mouth* is slight in 19 individuals, moderately marked in 17, considerable in 1.

Concerning the *lips* the following notes are made: thin in 15 individuals, medium in 15, thick in 6, everted in 1.

The *prominence of the face transversely*. The face is generally flat with very pronounced cheek-bones. In 19 individuals this flatness is »well marked», in 14 »excessive». The face is described as mesoprosopic in only 4 individuals.

The length and breadth diameters of *the head* are fairly considerable, though less than in the case of the Kirghiz, who are dealt with later on.

With regard to the maximum *head-length* the following general values are given: $M \pm m = 185.62 \pm 1.24$ mm, Min. 168 mm, Max. 201 mm, $\sigma = 7.64$, $v = 4.01$.

The maximum *head-breadth* is very considerable: $M \pm m = 159.53 \pm 1.09$ mm, Min. 146 mm, Max. 170 mm, $\sigma = 6.53$, $v = 4.085$.

The *cephalic index*, as might be concluded from the absolute diameters, is very high: $M \pm m = 86.04 \pm 0.74$, Min. 76.8, Max. 93.85, $\sigma = 4.43$, $v = 5.15$. The individuals examined fall into the established index groups in the following manner:

mesocephalic	(index 76.0—80.9)	5 ind. or 13.0 %
brachycephalic	(» 81.0—85.4)	13 » » 36.1 »
hyperbrachycephalic	(» 85.5— x)	18 » » 50.0 »

Thus the hyperbrachycephalics represent exactly 50 % of the materials. It should further be mentioned that among the hyperbrachycephalics there are as many as 5 individuals, whose index exceeds 91 and who are usually described as ultrabrachycephalic or isocephalic. In spite of the fairly great variability to be noted regarding the head measurement, the Kalmuks must therefore be described as in a high degree brachycephalic.



Fig. 34 and 35. *Kalmuk Numgan, aged 55.*



Fig. 36 and 37. *Kalmuk under-officer Nodja, aged 26.*



Fig. 38 and 39. *Buga, Kalmuk officer.*



Fig. 40 and 41. *Kalmuk Ulzamunk, aged 20.*

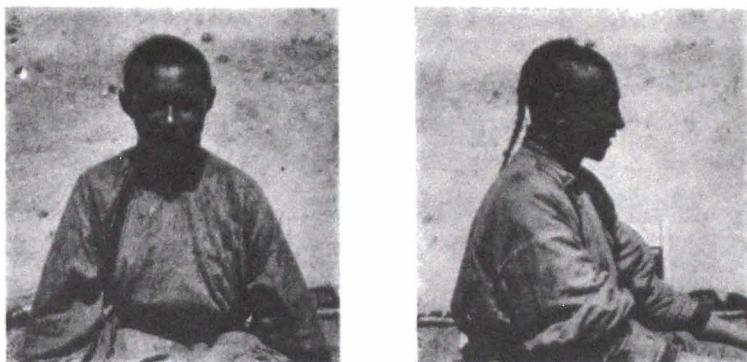


Fig. 42 and 43. *Kalmuk Sachka*,
aged 23.

The *height of the head* calculated from the vertex to the tragus of the ear is in general small: $M \pm m = 122.67 \pm 1.15$ mm, Min. 107 mm, Max. 138 mm, $\sigma = 6.98$, $v = 5.69$.

The relation of the height to the greatest length of the head and to its greatest breadth is illustrated by the following values:

Height-length index: $M \pm m = 66.11 \pm 0.55$, var. 58.71—73.74, $\sigma = 3.36$, $v = 5.09$.

Height-breadth index: $M \pm m = 77.01 \pm 0.79$, var. 69.23—87.34, $\sigma = 4.76$, $v = 6.08$.

According to the height-length index the materials fall into the customary index classes as follows:

orthocephalic	(index 57.7—62.5)	4 ind. or 10.8 %
hypsicephalic	(» 62.6—x)	33 » » 89.2 »

According to the height-breadth index the materials are divided as follows:

tapeinocephalic	(index x—78.9)	23 ind. or 63.9 %
metriocephalic	(» 79.0—84.9)	11 » » 30.6 »
acrocephalic	(» 85.0—x)	2 » » 5.5 »

In proportion to the length the head is therefore generally high, but in proportion to the breadth low or fairly low.

The size and shape of the *face* are illustrated by the bizygomatic breadth and the height of the face.

Bizygomatic breadth: $M \pm m = 153.14 \pm 0.98$ mm, var. 140—166 mm, $\sigma = 5.95$, $v = 3.89$.

Height of the face: $M \pm m = 117.00 \pm 1.195$ mm, var. 103—130 mm, $\sigma = 7.27$, $v = 6.21$.

The bizygomatic breadth is thus extraordinarily large and varies within fairly narrow limits, while the mean height must be described as small, but very varied.

The *facial index*, as might be concluded from the above, shows very low values in general: $M \pm m = 76.37 \pm 0.69$, Min. 68.39, Max. 86.99, $\sigma = 4.18$, $v = 5.47$.

The mean therefore lies in the *hyperuryprosopic* class. If we divide the individuals examined into the accepted classes, we obtain the following table:

hyperuryprosopic	(index x—78.9)	29 individuals or 78.4 %
uryprosopic	(» 79.0—83.9)	6 » » 16.2 »
mesoprosopic	(» 84.0—87.9)	2 » » 5.4 »

The hypereuryprosopic individuals constitute the absolutely preponderating majority, almost 4/5 of the materials, while eury- and mesoprosopy are represented in small numbers and leptoprosopy does not occur at all.

The extraordinarily broad face is, however, not accompanied by a broad and short nose, the nose mostly being comparatively high and narrow.

The absolute size of the nose and its variability are indicated by the following values:

Nasal height: $M \pm m = 49.95 \pm 0.56$ mm, var. 41—56 mm, $\sigma = 3.38$, $v = 6.76$.

Nasal breadth: $M \pm m = 36.41 \pm 0.16$ mm, var. 31—42 mm, $\sigma = 2.81$, $v = 7.73$.

Thus the absolute dimensions vary very much, but in general the height is fairly considerable, but the breadth small. This is also evident in the values of the *nasal index:* $M \pm m = 73.17 \pm 1.12$, var. 58.18—86.96, $\sigma = 6.83$, $v = 9.33$.

According to the mean value the nose is mesorrhine, rather close to the leptorrhine limit. The materials are divided according to the accepted classification as follows:

leptorrhine	(index 55.0—69.9)	13 individuals	or 35.14 %
mesorrhine	(» 70.0—84.9)	23 »	» 62.16 »
chamaerrhine	(» 85.0—99.9)	1 »	» 2.70 »

In addition to the mesorrhine, therefore, the leptorrhine individuals are also numerously represented in the materials, whereas chamaerrhinism is a very rare phenomenon.

Regarding the *stature and proportions of body* the following mean figures can be given:

	$M \pm m$		var.	σ	v
Standing height	162.15 \pm 1.15	cm	150.0—178.9	cm	7.01 4.32
Height to sternal notch	132.43 \pm 1.02	»	121.2—146.0	»	6.22 4.69
Height of upper limb	73.22 \pm 0.66	»	66.6— 81.0	»	3.99 5.45
Height of cubit	45.74 \pm 0.38	»	41.5— 50.6	»	2.31 5.06
Length of hand	17.38 \pm 0.18	»	15.9— 19.2	»	1.08 6.23
Length of foot	24.51 \pm 0.25	»	22.4— 26.9	»	1.38 6.06
Sitting height	85.85 \pm 0.56	»	80.6— 96.9	»	3.38 3.93
Span of arms	171.90 \pm 1.50	»	154.4—193.6	»	9.14 5.32

According to the mean figures the Kalmuks are short. Their stature varies very much, however, as the following table shows:

150.0—154.9 cm	7 individuals	165.0—169.9 cm	3 individuals
155.0—159.9 »	6 »	170.0—174.9 »	4 »
160.0—164.9 »	15 »	175.0— x »	2 »

The mean relative length of the upper limbs is 45.15 %, a comparatively high figure. The span of the arms is also considerable, exceeding the stature in all the cases; the mean relative span is 106.01 %. The mean sitting height is 52.9 % of the stature or comparatively high, as in Mongolide groups in general. The hands are rather small — the mean relative length of the hand is 10.7 %. If we subtract the sitting height from the stature and describe the difference as the length of the lower limbs, the mean of the latter is 76.30 cm or 47.06 %.

of the stature. The relative length of the feet is 15.12. It should be noted, however, that the variability of all these measurements is comparatively large.

The average coefficient of variation for 12 measurements and indices of the head is 5.79, for 8 measurements of the body 5.3 and for all 20 characters 5.63.

The idea obtained on the basis of MANNERHEIM's materials concerning the anthropology of the Kalmuks corresponds very well on the whole with what we find in the characterisations of earlier explorers. The Kalmuks (with the Mongolians »proper«, the Buriats and some smaller tribes)⁷ are considered to be the most typical representatives of the Mongolide race, and this is indicated by the observations quoted above. In IWANOWSKI's division⁸ they belong to the »Mongolian anthropological group«, in MONTANDON's classification⁹ they are referred to the subsidiary race of the Mongolide main race which is known as »sous-race mongolienne, groupe somatique mongolique«, in VON EICKSTEDT's classification¹⁰ to »die Tungiden des mongoliden Hauptstamms«. I quote MONTANDON's concise description (p. 226, 1933): »Groupe somatique mongolique: Le mieux connu, celui qui doit servir d'étalon pour la sous-race et passer comme le type le plus représentatif de toute la grand' race mongoloïde: peau pâlement cuivro-bistrée, cheveux longs, lisses, raides et noirs, yeux brun foncé, stature 1m63, membres courts, I.C.86, tapeinocéphalie (crânes 82), bride mongolique typique, fente palpébrale courte, espace interoculaire large, pommettes fortement saillantes en avant, mésorrhinie avec tendance à la leptorhinie (75), racine du nez à peine enfoncée. Ce groupe somatique est représenté, presque pur, on l'a dit plus haut, par la majorité des individus de 3 peuples: les Mongols, les Bouriates, et les Kalmouk.« I also refer the reader to EICKSTEDT's detailed description (pp. 192—194) of the »Tungids« which sums up the observations we have given above about the Kalmuks in an excellent manner.

VI. KIRGHIZ

The Kirghiz (Khazak-Kirghiz) examined come from various places round the river Dshirgalan east of Qulja. The measurements were made at the end of May and the beginning of June, 1907. Regarding the measurements and the appearance of the Kirghiz MANNERHEIM gives some information in his diary (pp. 252 and 261), to which the reader is referred.

The individuals examined, 29 in all, were all over 25 years old with the exception of a youth of 21, who is included, however, in the following synopsis.

General condition. MANNERHEIM writes in his diary (p. 261): »Their expressions are healthy, condition mediocre. There are some thin people, but very rarely any stout ones. Their muscles are only slightly developed«. Of the individuals who were examined anthropologically 23 were of type 2 (medium), 6 of type 3 (thin).

The *skin colour* is white: in 16 individuals pale (type 9), in 11 yellowish (type 7), in 2 rosy (type 10).

The *eye colour* is mostly or in 17 individuals dark. In 9 individuals the colour is described as medium, in 4 individuals — this seems rather remarkable — as light.

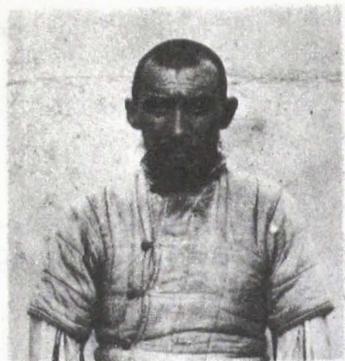


Fig. 44 and 45. *Khirgiz Chakaway, aged 50.*

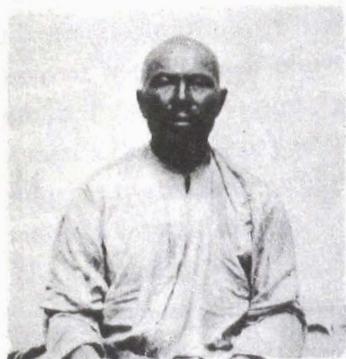


Fig. 46 and 47. *Khirgiz Malchabay, aged 50.*



Fig. 48 and 49. *Khirgiz Tanadjan, aged 33.*

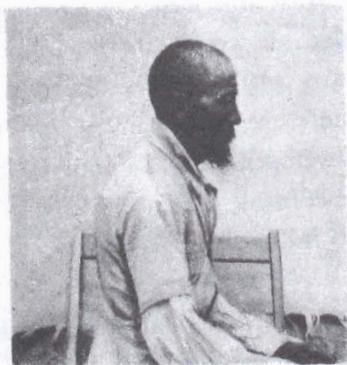


Fig. 50 and 51. *Khirgiz Djoulouk bay, aged 41.*



Fig. 52. Kirghiz, aged 37. Fig. 53. Kirghiz, aged 24. Fig. 54. Kirghiz, aged 47.

The *Mongolian fold* is absent in most cases or in 22 individuals (75.9 %). In 4 individuals (13.8 %) traces of the fold were observed, and in 3 cases only (10.3 %) does the fold cover a third to a half of the caruncle. MANNERHEIM says in his diary (p. 261): «The eyes are small, but the caruncle is almost always uncovered».

The *hair colour* is black in most cases or in 26 individuals, while in 2 cases the colour is described as dark brown and in 1 case as medium.

The *hair quality* is straight in all the individuals examined.

The *hair amount*. The growth of beard is scarce in 19 individuals (65.5 %), medium in 10 (34.5 %). The amount of hair on the body is still smaller: in 19 cases it is described as absent, in 9 as scarce, and in only 1 case as medium.

The *shape of the face* varies considerably according to the notes: type 2 («medium») in 6 individuals, type 2—5 in 2, type 3 («short and broad») in 9, type 3—5 in 4, type 5 («wedge-shaped», but moderately) in 8. In none of the individuals is the face long and narrow.

The *profile of the nose* also varies, but type 1 (straight) is the most general. For details the reader is referred to the individual tables. MANNERHEIM's diary (p. 261) mentions: «The nose is well shaped and fine, but small».

The *prominence of the region of the mouth* is illustrated by the following notes: slight in 12 individuals (41.4 %), moderately marked in 15 (51.7 %), absent in 2 (7.0 %).

The *lips* of 11 individuals are thin, of 18 medium.

Prominence of the face transversely. Not a single one of the individuals measured has a prominent face, in all cases the face is more or less flat. 23 individuals (79.3 %) are described as platyoprosopic, 12 of them having well marked cheek-bones, 11 excessive cheek-bones. Only 6 individuals (20.7 %) are described as mesoprosopic, though 2 of them with a distinct trend towards platyoprosopy (type 3—4). Notwithstanding this pronounced platyoprosopy and the pronounced cheek-bones connected with it, MANNERHEIM states in his diary that «the cheekbones are less prominent than in the case of the Kalmuks».

The *head-length* is fairly considerable: $M \pm m = 188.76 \pm 1.01$ mm, Min. 178 mm, Max. 198 mm, $\sigma = 5.42$, $v = 2.87$. The variability is thus not particularly great, which is also seen, if the materials are divided into 5 cm groups:

x —179.9 mm	.....	1 individual	190.0—194.9 mm	.....	9 individuals
180.0—184.9 »	.....	8 »	195.0— x »	.....	4 »
185.0—189.9 »	.....	7 »			

The *head-breadth* varies more than the length; on the average it must be described as extraordinarily great. $M \pm m = 163.62 \pm 1.06$ mm, Min. 153 mm, Max. 177 mm, $\sigma = 5.66$, $v = 3.46$. If we divide the materials into 5 cm groups, we obtain the following table:

x —154.9 mm	.....	1 individual	165.0—169.9 mm	.....	9 individuals
155.0—159.9 »	.....	8 »	170.0—174.9 »	.....	— »
160.0—164.9 »	.....	9 »	175.0— x »	.....	2 »

The *cephalic index*, as shown by the absolute diameters, is extraordinarily high. $M \pm m = 86.86 \pm 0.89$, Min. 79.8, Max. 96.2, $\sigma = 3.70$, $v = 4.26$. The mean therefore lies, as in the case of the Kalmuks, within the sphere of hyperbrachycephaly. The accepted groups include the following numbers of individuals:

mesocephalic	(index 76.0—80.9)	2 individuals	or 6.9 %
brachycephalic	(» 81.0—85.4)	10 »	» 34.5 »
hyperbrachycephalic	(» 85.5— x)	17 »	» 58.6 »

Thus only 2 individuals of those examined fall within the limits of mesocephaly and both of them are on the border of brachycephaly. More than half of the individuals examined are hyperbrachycephalic, and 3 of these are ultrabrachycephalic or isocephalic with an index that exceeds 91. This exceedingly brachycephalic form of head which distinguishes the Kirghiz is principally due to the great absolute measure of the breadth, less to a short diameter of the head-length.

The *head-height*, calculated from the vertex to the tragus of the ear, is comparatively small in general, but varies within fairly wide limits. $M \pm m = 125.27 \pm 1.31$ mm, Min. 112 mm, Max. 137 mm, $\sigma = 7.03$, $v = 5.61$.

If we calculate the height-length and height-breadth indices, which give an idea of the relative height of the skull, on the basis of the absolute diameters, we obtain the following values:

length-height index: $M \pm m = 66.41 \pm 0.82$, Min. 58.08, Max. 73.77, $\sigma = 4.39$, $v = 6.62$.

length-breadth index: $M \pm m = 76.60 \pm 0.81$, Min. 67.07, Max. 83.44, $\sigma = 4.36$, $v = 5.69$

According to the height-length index there are among the individuals examined

orthocephalic	(index 57.7—62.5)	5 individuals	or 17.2 %
hypsiccephalic	(» 62.6— x)	24 »	» 82.8 »

According to the height-breadth index the materials are divided as follows:

tapeinocephalic	(index x —78.9)	19 individuals	or 65.5 %
metriocephalic	(» 79.0—84.9)	10 »	» 34.5 »

In relation to the length, therefore, the skull is fairly high, as among the Kalmuks, in relation to the breadth it is low or even very low.

Of the *facial* measurements we mention the bizygomatic breadth and the facial height from nasion to chin.

The *breadth of the face* is very considerable, as is to be expected in view of the prominent cheek-bones: $M \pm m = 153.41 \pm 0.03$ mm, Min. 142 mm, Max. 163 mm, $\sigma = 5.01$, $v = 3.27$.

The *height of the face* is small in proportion to the bizygomatic breadth. This is seen from the following values: $M \pm m = 113.90 \pm 1.35$ mm, Min 90 mm (!), Max. 124 mm, $\sigma = 7.29$, $v = 6.40$.

The *facial index* records low values in general, as should be evident from the above. $M \pm m = 74.27 \pm 0.84$, Min. 58.8, Max. 81.5, $\sigma = 4.66$, $v = 6.12$.

According to the accepted classification the materials are divided as follows:

hypereuryprosopic (index x —78.9)	25 individuals or 86.2 %
euryprosopic (» 79.0—83.9)	4 » » 13.8 »

Hypereuryprosopy, the class in which the mean lies, is completely predominant. It should be noted that even the euryprosopic, who are represented by a small number, are very close to the border of hypereuryprosopy. Mesoprosopy is not represented at all.

The exceedingly broad face is not accompanied, however, by a very broad and short nose, any more than among the Kalmuks, the nose being, rather, high and narrow.

Nasal height: $M \pm m = 52.06 \pm 0.63$ mm, Min. 46 mm, Max. 61 mm, $\sigma = 3.37$, $v = 6.47$.

Nasal breadth: $M \pm m = 38.52 \pm 0.52$ mm, Min. 34 mm, Max. 46 mm, $\sigma = 2.78$, $v = 7.22$.

The *nasal index* records fairly low values in general, though the extent of variation is remarkably large. $M \pm m = 74.19 \pm 1.13$, Min. 55.7, Max. 86.8, $\sigma = 6.10$, $v = 8.22$.

The materials are divided into the accepted index groups in the following manner:

leptorrhine (index x —69.9)	4 individuals or 13.8 %
mesorrhine (» 70.0—84.9)	24 » » 82.8 »
chamaerrhine (» 85.0— x)	1 » » 3.4 »

It is significant that only one individual in the materials is broad-nosed, chamaerrhine.

The *stature and proportions of the body* are illustrated by the following table:

	$M \pm m$	Var.	σ	v
Standing height	165.68 ± 1.03 cm	154.1—178.7 cm	5.64	3.36
Height to sternal notch	134.94 ± 0.92 »	125.6—145.8 »	4.96	3.68
Length of upper limb	75.14 ± 0.52 »	70.3— 81.8 »	2.79	3.72
Length of cubit	46.72 ± 0.35 »	43.2— 50.3 »	1.88	4.03
Length of hand	17.65 ± 0.196 »	16.3— 20.6 »	1.06	5.97
Length of foot	24.48 ± 0.25 »	22.4— 27.0 »	1.34	5.46
Sitting height	87.30 ± 0.64 »	81.7— 95.3 »	3.42	3.92
Span of arms	173.92 ± 1.89 »	155.9—189.0 »	7.11	4.09

It seems to be worth while pointing out that the variability, as indicated by the values for the standard deviation and coefficient of variation, is throughout less than among the Kalmuks. The average coefficient of variation for 12 measurements and indices of the head is 5.52, for 8 measurements of the body 4.28, for all 20 characters 4.44.

The stature is slightly larger on the average than among the Kalmuks. Its division in the materials is illustrated by the following table:

x	—154.9	cm	.....	1	individual	165.0—169.9	cm	.....	8	individuals
	155.0—159.9	»	.....	1	»	170.0—174.9	»	.....	2	»
	160.0—164.9	»	.....	15	»	175.0— x	»	.....	2	»

Thus the prevalence lies, as in the case of the Kalmuks, in the class 160—164.9 cm.

The following relative mean values, which give an idea of the proportions, may be quoted: of the upper limbs 45.3 %, of the lower limbs 47.3 %, of the sitting height 52.7 %, of the span of the arms 104.9 %, of the hands 10.7 %, of the feet 14.8 %. These figures, it will be seen, are almost exactly the same as for the Kalmuks.

The Kirghiz are reminiscent — and this is shown not only by our small materials, but also by former investigations — in certain respects of those groups that are usually described as typically Mongolide. GIUFFRIDA-RUGGERI¹¹ refers both Kirghiz and Kalmuks (as well as several other groups: Tunghus, Buriats, Torguts, Telengets etc.) to the same sub-race of the »Asiatic xantoderms», viz., *Homo asiaticus centralis*. But pronounced differences can also be proved between the Kirghiz on the one hand and the Kalmuks and Mongols on the other, as our materials, too, indicate, e.g., in regard to the occurrence of the Mongolian fold. It is consequently customary in many, or rather, in most classifications to refer the Kirghiz to another anthropological group than the Kalmuks, whom we have already dealt with. IWANOWSKI¹², for instance, speaks of »a Central-Asiatic anthropological group», to which he refers the Kirghiz besides a number of other peoples and tribes, principally in the »Qulja district», but not the Kalmuks. MONTANDON¹³ and VON EICKSTEDT¹⁴ establish a »Turanian race» (»race tourannienne», »die turanide Rasse»), whose area of extension embraces enormous regions in Western Asia. This race, to which the Kirghiz are referred, occupies, so to say, an intermediate position between the Europide and the Mongolide main races, »une race intermédiaire européïdo-mongoloïde», as MONTANDON expresses it. But while MONTANDON refers the Turanians as a sub-section to his »grand' race mongoloïde», VON EICKSTEDT includes them very decidedly in the Europide main race, although he admits that they have »einige mongoloïde Züge». These Mongoloid features are explained by him as follows (p. 170): »Tatsache ist, dass die Turaniden seit uralter Zeit, gewissermassen seitdem die 'Menschheit' besteht, an der Grenze der beiden Rassenkreise lebt, und dass sie hier, und zwar zweifellos schon v o r der Zeit der endgültigen Differenzierung der Rassen, in Kontakt und biologischer Verflechtung mit altmongoliden Formen stand».

But how is the race characterised, in which the Kirghiz are included? IWANOWSKI points out (pp. 207—208,) that the eyes and hair are dark, though in exceptional cases light, that the body is of medium height, occasionally tall, that the trunk is elongated, that the shape of the head is brachycephalic or (just as among the Kirghiz) very greatly brachycephalic, that the nose is leptorrhine, occasionally euryrrhine. To this characterisation MONTANDON adds the following special features (p. 234, 1933): »peau tenant le milieu entre le blanchâtre, le jaunâtre et le brunâtre, système pileux plus développé que chez le

Mongolien, stature moyenne de 166, tendance à l'obésité, I.C. 86 (la rencontre de la brachycéphalie europeïde la plus forte et de la brachycéphalie mongoloïde la plus forte a produit une brachycéphalie presque encore plus forte), face allongée, pommettes relativement proéminentes, lèvres parfois relativement épaisses, nez proéminent mais droit, oeil mi-mongoloïde.» It must be admitted that these descriptions correspond on the whole to the materials we have dealt with above — but with the exception that, according to MANNERHEIM's notes, the face can scarcely be described as »allongée». According to EICKSTEDT »der durchschnittliche Turanide (ist) mässig gross, aber dabei grazil gebaut, mit mässig langem Gesicht, kräftiger gerader Nase und starkem Haarwuchs. Zu im allgemeinen europidem Gesichtsschnitt treten kleine Augenspalte und etwas vorgeschobene Wangenbeine, die als ein Erbe von mongolider Seite angesehen werden können.» According to our materials they can in no case be described as having a »strong growth of hair» and scarcely as having only »etwas» prominent cheek-bones.

The question of the Turanian race seems to me still to be open and therefore also that of the racial position of the Kirghiz. I cannot omit, besides, to point out that according to our materials, which are, indeed, small, the similarities between the Kirghiz and the Kalmuks, who are considered to be typical Mongolide representatives, are in spite of certain dissimilarities very clear — so clear that it would not seem desirable to draw such a sharp distinction between them as VON EICKSTEDT does. It seems to me to be obvious in any case that the Kirghiz contain a very considerable Mongolide element — the same element which constitutes the main framework among the Kalmuks, as well as among the Torguts whom we deal with later. It looks as though BIASUTTI¹⁵ were quite right in calling the Kirghiz (p. 230) »ibridi turanico-tungide».

VII. TORGUTS.

The Torgut materials, which are the largest that MANNERHEIM brought back from Central Asia, come from the districts round the river Yuldus in the Tian Shan mountains between Qulja and Qarashahr. The investigations were made from June 17th to August 8th, 1907.

The materials embrace 50 male individuals, whose age varies between 19 and 48. Of the individuals examined 2 are 19, 4 are 20, 7 are 21, 3 are 22, 3 are 23, 3 are 24, the rest or 28 individuals are 25 years old or more. Thus probably not all the individuals were fully developed, but as they may be described, at any rate to a large extent, as adult and as the age-limit for the completion of development cannot be established, I deal below with all the materials as a whole in the hope of not making any great error in doing so.

The *general condition*, according to the notes, is medium (type 2) in most cases or in 32 individuals, thin (type 3) in 10 individuals, thick (type 1) in 6 individuals; for 2 individuals there are no notes concerning the general condition.

The *colour of the skin* is »white» (types 7—10) in all the individuals: in 25 pale (type 9), in 6 rosy (type 10), in 3 yellowish (type 7), in 3 brownish (type 8), in 7 pale-rosy (type 9—10), in 5 yellowish-pale (type 7—9), in 1 brownish-rosy (type 8—10).



Fig. 55 and 56. *Torgut Bomba*,
aged 24.



Fig. 57 and 58. *Torgut Pirla*,
aged 34.



Fig. 59 and 60. *Torgut Gandan*,
aged 27.



Fig. 61 and 62. *Torgut Dordja*,
aged 48.



Fig. 63 and 64. *Torgut Ewga*,
aged 29.

The *colour of the eyes* varies rather. The majority of the individuals examined or 29 (58 %) have dark eyes, (type 1), it is true, but in as many as 20 individuals (40 %) the colour of the eyes is described as medium («all medium shades except green») and in 1 individual as light.

The *Mongolian fold* occurs in practically all the individuals examined, at any rate in some form — only in 1 individual it is described as absent. In 32 individuals (64 %) the fold covers «a half to a third of the caruncle», in 9 individuals (18 %) it covers the whole caruncle, while in 8 individuals (16 %) a «vestige remaining» can be noted. All the individuals, in which the Mongolian fold is visible to a small extent or is absent, are over 25 years of age, most of them over 30.¹⁶

The *colour of the hair* is dark in almost all cases: in 40 individuals (80 %) black, in 9 (18 %) dark brown, only in 1 (2 %) medium.

The *quality of the hair* is straight; only in 1 individual it is described as curly.

Hair amount. The amount of hair is in all cases scarce or absent. A growth of beard is absent in 2 individuals (one of 19, the other of 21), scarce in 37 individuals, medium in 11. Growth of hair on the body is absent in 42 individuals, scarce in 8.

The *shape of the face* is illustrated by the following notes: type 1 (long and narrow) in 1 individual, type 2 (medium) in 9, type 3 (short and broad) in 16, type 5 (wedge-shaped, i.e. pointed towards chin) in 16, type 3—5 in 8.

Regarding the *profile of the nose* there are the following notes: straight (1) in 26 individuals, aquiline (2) in 1, concave or turned-up (3) in 4, high-bridged (4) in 7, sinuous or wavy (5) in 5, Chinese type (6) in 1, and the intermediate shapes 1—2 in 1 individual, 1—3 in 3, 1—4 in 1 and 1—5 in 1. The profile of the nose is therefore fairly varied, though the straight shape occurs most generally.

The *prominence of the face in the region of the mouth* is moderately marked in the majority or 34 individuals (68 %), slight in 10 (20 %), considerable in 6 (12 %).

The *lips* are medium thick in 33 individuals (66 %), thin in 13 (26 %), thick in 4 (8 %)

The *prominence of the face transversely.* A flat face with very prominent cheek-bones is a distinguishing feature of the Torguts. In 31 individuals (62 %) the platyprosopy is excessive, in 18 (36 %) well marked. Only 1 individual is described as mesoprosopic.

The *maximum length of head* is not very great and varies within fairly narrow limits. $M \pm m = 184.60 \pm 0.72$ mm, Min. 172 mm, Max. 196 mm, $\sigma = 5.13$, $v = 2.78$.

The *maximum breadth of head* is in general very great, but varies much more than the length. $M \pm m = 158.02 \pm 0.97$ mm, Min. 140 mm, Max. 175 mm, $\sigma = 6.83$, $v = 4.32$

The *cephalic index*, as appears from the above figures, records very high values, $M \pm m = 85.63 \pm 0.51$, Min. 78.06, Max. 92.59, $\sigma = 3.60$, $v = 4.20$.

The mean value lies in the hyperbrachycephalic class, although it is slightly lower than among the extraordinarily brachycephalic Kirghiz and Kalmuks. The individuals examined fall into the accepted index groups as follows:

mesocephalic	(index 76.0—80.9)	6 individuals	or 12 %
brachycephalic	(» 81.0—85.4)	18 »	» 36 »
hyperbrachycephalic	(» 85.5— x)	26 »	» 52 »

Among the hyperbrachycephalic there are 7 individuals with an index above 90, and of these 4 have an index above 91 or so-called isocephalic or ultrabrachycephalic. This great brachycephaly is due, as in the case of the Kirghiz and Kalmuks, to the great breadth of the head.

Head-height: $M \pm m = 123.04 \pm 0.81$ mm, Min. 108 mm, Max. 133 mm, $\sigma = 5.70$, $v = 4.63$.

The relative height of the head is seen from the following indices:

Height-length index: $M \pm m = 66.68 \pm 0.44$, var. 59.34—73.08, $\sigma = 3.08$, $v = 4.62$.

Height-breadth index: $M \pm m = 77.95 \pm 0.55$, var. 70.63—87.76, $\sigma = 3.87$, $v = 4.97$.

According to the height-length index the materials fall into the accepted index classes as follows:

orthocephalic	(index 57.7—62.5)	4 individuals	or 8 %
hypsicephalic	(» 62.6— x)	46 »	» 92 »

According to the height-breadth index we obtain the following division:

tapeinocephalic	(index x —78.9)	34 individuals	or 68 %
metriocephalic	(» 79.0—84.9)	14 »	» 28 »
acrocephalic	(» 85.0— x)	2 »	» 4 »

In relation to the length of the head the height is mostly great, but in proportion to the very considerable breadth of the head it is small or very small — as the case is on the whole among the Kalmuks and Kirghiz.

The dimensions of *the face* are indicated by the following values:

Bizygomatic breadth: $M \pm m = 151.50 \pm 0.85$ mm, var. 134—169 mm, $\sigma = 6.01$, $v = 3.97$

Facial height: $M \pm m = 119.10 \pm 0.85$ mm, var. 102—130 mm, $\sigma = 5.999$, $v = 5.04$.

Among the Torguts, therefore, the face is higher and less broad in comparison with the Kirghiz and Kalmuks. The *facial index* does not record such low values as among the Kirghiz and Kalmuks in view of this. $M \pm m = 78.696 \pm 0.62$, Min. 68.46, Max. 91.04, $\sigma = 4.41$, $v = 5.60$.

If we follow the usual index division, we obtain the following table for the division of the facial index:

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hypereuryprosopic (index x —78.9)	29 individuals or 58 %
euryprosopic (» 79.0—83.9)	15 » » 30 »
mesoprosopic (» 84.0—87.9)	5 » » 10 »
leptoprosopic (» 88.0—92.9)	1 » » 2 »

Of the dimensions of the nose the following values give us an impression:

Nasal height: $M \pm m = 50.02 \pm 0.41$ mm, var. 43—57 mm, $\sigma = 2.03$, $v = 5.86$.

Nasal breadth: $M \pm m = 37.52 \pm 0.31$ mm, var. 32—43 mm, $\sigma = 2.18$, $v = 5.82$.

It will be seen that the variability is rather small in comparison with the corresponding values among the Kirghiz and Kalmuks. Similarly to the case in these two tribes, the nose is fairly high and narrow and thereby in a way «disharmonic» in relation to the broad and flat face.

The values of the *nasal index* are as follows: $M \pm m = 75.82 \pm 0.70$, var. 61.54—9.11, $\sigma = 5.60$, $v = 7.45$. According to the usual bases of division the individuals examined are divided into the different index groups as follows:

leptorrhine (index x —69.9)	7 individuals or 14 %
mesorrhine (» 70.0—84.9)	41 » » 82 »
chamaerrhine (» 85.0— x)	2 » » 4 »

Mesorrhinism is therefore most general, but leptorrhinism is also not very rare

The *stature and proportions of body* are illustrated by the following table:

	$M \pm m$	Var.	σ	v
Standing height	164.16 —0.90 cm	152.7—177.5 cm	6.897	3.897
Height to sternal notch	135.20 —0.80 »	121.7—146.6 »	5.68	4.30
Height of upper limb	73.92 —0.44 »	66.7— 80.0 »	3.14	4.83
Height of cubit	45.98 —0.299 »	40.9— 49.9 »	2.12	4.61
Length of hand	17.64 —0.18 »	15.6— 19.8 »	0.98	5.29
Length of foot	24.23 —0.17 »	22.1— 26.3 »	1.17	4.64
Sitting height	86.796 —0.54 »	79.4— 96.7 »	3.79	4.87
Span of arms	173.18 —1.00 »	155.5—186.1 »	7.10	4.10

According to the materials the Torguts are of short stature, though not as short as the Kalmuks nor as tall as the Kirghiz. The mean relative length expressed in percentage of the stature of the upper limbs is 45.03. The corresponding length of the lower limbs — i.e. the stature less the sitting height — is 47.14. The relative length of the sitting height is 52.86, a comparatively high figure. The hands are small, 10.77, the feet, too, are small, 14.76. The span of the arms is rather appreciable, relatively 105.46, but there are 4 individuals in the materials, in whom the span of the arms is slightly less than the stature.

The Torguts have been the subject of anthropological investigation on previous occasions. I refer principally to IWANOWSKI's large monograph¹⁷ on the Torguts in the Kobok-Zari valley south of the Tarbagatai. I cannot omit giving IWANOWSKI's general characterisation (slightly abbreviated) according to his German summary¹⁸ (p. 82, 1897): »Die Mongolen (Torgouten) sind mittelgross gewachsen mit mehr Neigung zur Kleinwüch-

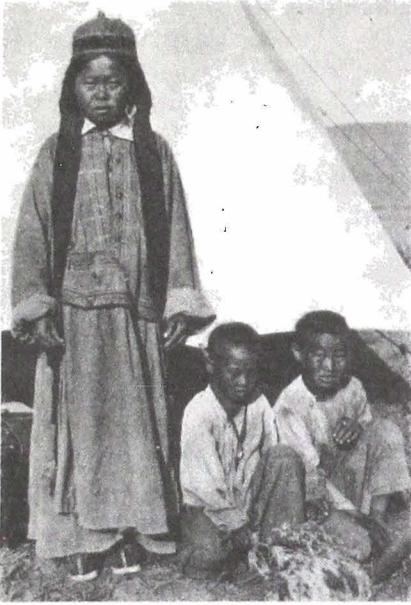


Fig. 65. *Torgut woman with her two boys.*



Fig. 66. *Torgut woman, aged 28.*

sigkeit als zur Grosswüchsigkeit. Ihr Haar ist schwarz, hart, relativ dünnstehend. Der Bart ist sehr kurz und dünn und tritt nicht vor 25 Jahren auf. Der Schnurrbart ist ebenfalls dünn und kurz. Von bedeckten Körperstellen sind nur die Achselhöhlen und die Symphysis pubis mit einem schwachen Haarwuchs bekleidet. Am ganzen übrigen Körper fehlt das Haar vollständig. Die Hautfarbe der Mongolen (Torgouten) ist an bedeckten Stellen hell und auf den offenen Stellen braun von der Sonne. Der Name »gelbe Rasse« ist auf die Mongolen (Torgouten) durchaus nicht anwendbar. Die Augenfarbe ist schwarz und wird im hohen Alter heller. Die mongolische Falte kommt nur bis zum Alter von 20 Jahren scharf zum Ausdruck, im hohen Alter wird sie ganz verwischt. Der Kopf ist relativ gross, wobei seine absolute Grösse bei den grosswüchsigem, die relative bei den kleinwüchsigem am bedeutendsten ist. Der Schädel ist in der Länge und Höhe mässig entwickelt, bedeutend dagegen in der Breite, so dass die Mongolen nach dem Kopfindex als Brachycephalen erscheinen. Die Gesichtstheile sind ebenfalls in der Länge mässig, in der Breite stark entwickelt. Nach dem Gesichtindex sind die Mongolen megasem. Die Nase ist durch eine sehr bedeutende sowohl relative als absolute Länge ausgezeichnet. Die Breite der Nase ist ebenfalls sehr beträchtlich. An der Basis ist sie stark plattgedrückt. Der Nasenrücken ist breit. Der Rumpf der Mongolen ist relativ nicht gross. Das Becken ist breit. Im Bau der mongolischen Arme und Beine ist charakteristisch, dass ihre oberen Theile (d.h. die Oberarme und die Oberschenkel) gross, die unteren aber relativ klein erscheinen.»

The picture provided by our materials, it will be seen, corresponds faithfully to IWANOWSKI'S characterisation.

The Torguts, like the Kalmuks, are considered very good representatives of the genuine Mongolide race, and these two tribes are consequently placed in the same group in most classifications. I will only mention IWANOWSKI,¹⁹ who includes them both — besides other tribes and peoples — in his »Mongolian anthropological group«, GIUFFRIDA-RUGGERI²⁰,

who speaks of »Homo asiaticus centralis», MONTANDON,²¹ who refers both to the »sous-race nord-mongolienne, groupe somatique mongolique», and VON EICKSTEDT,²² in whose classification both belong to »die Tungiden des mongoliden Hauptstamms». I have given some general particulars as to how this group, to which the Kalmuks and Torguts are referred, should be characterised briefly, in dealing with the Kalmuks.

Our materials tend to confirm the correspondence between both these groups. As regards the great majority of the characters we find on the whole the same values in both tribes — though with the proviso that the variability, as expressed in the standard deviation and the coefficient of variation, is almost universally less among the Torguts than among the Kalmuks. The average coefficient of variation for 12 measurements and indices of the head is 4.94, for 8 measurements of the body 4.44, for all 20 characters 4.74.

We should, however, not omit in conclusion to point out also the similarities existing between the Torguts and the Kirghiz — similarities, to which we have already had occasion to refer (p. 29).

VIII. YÖGURS.

At the end of December, 1907, MANNERHEIM had an opportunity of spending some days among the Sarö and Shera Yögurs, two small tribes which under the common name of »Hwang-fai» (the yellow barbarians) inhabit the northern reaches of the Nanshan mountains in the district of Kanchow-Hochow and part of the plain at their foot. Of these very imperfectly known tribes MANNERHEIM published an interesting description²³, to which I refer the reader.

During his stay at Kanglingusu, the chief monastery of the Shera Yögurs, MANNERHEIM had an opportunity of anthropologically examining 12 male individuals, belonging to this Yögur tribe. The details of the observations are included in MANNERHEIM's publication as an appendix. They would seem to be the only anthropological particulars of the Yögur tribe in existence.

Of the individuals examined 8 were lamas and 4 shepherds. One individual was only 16 years old, 1 was 20, 1 was 21, the rest between 26 and 60. The materials are, of course, too small to provide a reliable idea of the anthropology of the tribe. I will confine myself to giving a short survey and refer the reader to the individual tables at the end of this essay.

The *colour of the skin* varies between brownish, yellowish, pale and rosy.

The *colour of the eyes* is dark, occasionally medium. The *Mongolian eye-fold* occurs generally in young persons, but is sometimes absent in older ones.

The *hair* is black in colour, usually straight in quality, occasionally curly or undulating.

The *growth of beard* is scarce as a rule, *hair on the body* is non-existent.

The *profile of the nose* varies, it is mostly straight.

The *face* is most frequently flat with well marked, but not excessive cheek-bones, only in a few cases mesoprosopic.

The *head* is remarkably long; the mean maximum length of the head is 189.93 mm varying between 178 and 199 mm. The breadth of the head is on the contrary rather small, on an average only 150.83 mm, the extent of variation being 139—159 mm. The *cephalic*



Fig. 67 and 68. *Yögur Nortshap*,
aged 54.



Fig. 69 and 70. *Yögur man*.



Fig. 71 and 72. *Yögur man*.

index is consequently rather low: $M \pm m = 79.46 \pm 0.95$, var. 74.11—84.49, $\sigma = 3.29$, $v = 4.13$. Of the individuals examined 2 are dolichocephalic (index $x-75.9$), 5 mesocephalic (76.0—80.9) and 5 brachycephalic (81.0—85.49). Hyperbrachycephaly does not occur at all, although one individual is very close to the border of this class.

The *height of the head* (from the vertex to the tragus of the ear) is considerable, on an average 125.83 mm, with an extent of variation from 113 to 142 mm. The *height-length index* is fairly low in view of the high value of the height of the head: $M \pm m = 66.26 \pm 1.00$, var. 61.50—71.36, $\sigma = 3.46$, $v = 5.22$. According to the accepted division 3 of the individuals examined are orthocephalic and 9 hypsicephalic. The *height-breadth index* often records large values, but varies greatly: $M \pm m = 83.54 \pm 1.62$, var. 72.78—92.57, $\sigma = 5.61$, $v = 6.59$. According

to the customary division 2 of the individuals examined are tapeinocephalic, 5 metriocephalic and 5 acrocephalic. In proportion both to the maximum length of the head and to its maximum breadth the Yögurs have in general a high or fairly high head according to our materials.

The *face* is comparatively, but not excessively broad. The mean bizygomatic breadth is 147.58 (136—154) mm, the height of the face 122.25 (113—134) mm. The *facial index* varies, but mostly records fairly high values: $M \pm m = 82.98 \pm 1.24$, var. 77.18—91.16, $\sigma = 4.30$, $v = 5.19$. According to the customary division there are 3 hypereuryprosopic persons in the materials, 4 euryprosopic, 3 mesoprosopic and 2 leptoprosopic.

The mean *nasal height* is 50.98 (43—53) mm, the *nasal breadth* 38.88 (30—44) mm. The values for the *nasal index* are as follows: $M \pm m = 76.54 \pm 2.17$, var. 57.69—89.80, $\sigma = 7.52$, $v = 9.82$. The nose measurements are therefore very varied. According to the index the individuals examined consist of 1 leptorrhine, 9 mesorrhine and 2 chamaerrhine.

The *stature* (for 11 individuals, excluding the youth of 16) varies, averaging 164.51 (157.3—173.0) cm, the sitting height 86.42 (81.6—91.0) cm or 52.53 % of the stature, the upper limbs 73.84 (68.2—78.7) cm or 44.88 %, the lower limbs 78.08 (72.6—85.0) cm or 47.47 %, the length of the hand 17.77 (15.8—19.4) cm or 10.80 %, the length of the foot 24.52 (22.7—26.2) cm or 14.76 %, the span of the arms 170.38 (158.9—179.1) cm or 103.58 %.

Judging by our scanty materials there are considerable differences between the Yögurs and the Central Asiatic groups we have dealt with, which are regarded as typical Mongolides. This refers above all to the size and shape of the head. According to the absolute dimensions the head is generally longer and much narrower than among the Kalmuks, Torguts and Kirghiz, from which it also follows that the cephalic index records considerably lower values. The excessive brachycephaly, which distinguishes the Kalmuks, Torguts and Kirghiz, does not occur among the Yögurs. The absolute height of the head is on an average slightly higher than among the tribes mentioned, especially the Kalmuks and Torguts. The height-breadth index records entirely different values owing to these differences than among the tribes previously referred to. The dimensions of the face are also different: the bizygomatic breadth is considerably less, the height of the face considerably greater, so that the mean facial index is considerably higher, i.e. the face is narrower. The stature and proportions, on the contrary, do not record any considerable differences.

It should be emphasised, however, that the above remarks are only based on very limited materials, so that the results cannot be considered final.

In order to complete the picture of the physical anthropology of the Yögurs I quote a part MANNERHEIM'S description (p. 37, 1911):

»The Shera Yögurs are of medium height and not badly built. Those I had the opportunity of examining had, on the contrary, well-formed hands and feet and small wrists and ankles. There is nothing about them of the coarse and vulgar appearance which distinguishes the Kalmuks. Stout people are never seen — many of them are even remarkably thin. Their faces are neither exceptionally long and narrow nor short and broad, and though some have well developed cheek-bones, wide cheek-bones are rare, and in many individuals they are not at all protruding. The mouth is normal, with neither

Fig. 73. *Two Yögurs.*

thin nor thick lips, the nose straight and of a good shape. Some, however, had wide, turned-up noses, with very little bridge to them. The distance between the eyes was, among the majority, rather wide, though in some individuals normal. The corner of the eye is slightly overgrown by the eyelid in the case of children, but this peculiarity almost disappears as they grow older. The eyes are black or dark, with slight changes in them, but I saw no blue eyes. Their hair is black or quite dark, sometimes curly, the children often having brown hair. The men are never bald, but you often see them very grey, and, judging by the women, the growth of hair is not particularly good. They have very scanty beards, and there is seldom any growth of hair on the body»²⁴.

It seems to me that in regard to their physical properties the Yögurs should be referred mainly to the group which MONTANDON²⁵ calls »sous-race sinienne», HADDON²⁶ »homo sinicus» and VON ETCKSTEDT²⁷ »die Sinide Rasse». The illustrations, too, seem to favour this assumption. It is worth while mentioning in particular that, according to the information MANNERHEIM was able to collect regarding the origin and former fortunes of the Yögurs, the tribe came from much more northerly, Chinese districts. MANNERHEIM²⁸ writes (p. 31): »They had once lived in K'ouwai (outside the Great Wall), probably in the North, but possibly in the W or NW, which land in Chinese was called Tanguta, in their language Seche-Hache — some of them calling it Shilahu. They had left it very long ago and removed to their present surroundings».

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- 11) V. GIUFFRIDA-RUGGERI: *The First Outlines of a Systematic Anthropology of Asia*. Translated from Italian by HARANCHANDRA CHAKLADAR. Calcutta 1921.
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- 16) See note 6.
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- 19) A. A. IWANOWSKI (A. A. ИВАНОВСКИЙ): *op. cit.* 1904, p. 209.
- 20) V. GIUFFRIDA-RUGGERI: *op. cit.* 1921.
- 21) GEORGE MONTANDON: *op. cit.* 1933, pp. 224 and 226.
- 22) EGON VON EICKSTEDT: *op. cit.* 1934, p. 197.
- 23) C. G. E. MANNERHEIM: A visit to the Sarö and Shera Yögurs. *Journal de la Société Finno-ougrienne*, Vol. XXVII, Helsingfors 1911. — See also the diary, pp. 445—449 and 459—472.
- 24) See also the diary, p. 470.
- 25) GEORGE MONTANDON: *op. cit.* 1933, p. 228.
- 26) A. C. HADDON: *The races of Man and their distribution*. Cambridge 1924, p. 80.
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LIST OF INDIVIDUAL MEASUREMENTS

Explanations on pp. 4–6.

K A A R L O H I L D E N

Date	Locality	Name	Profession	Age	a	b	c	d	e	f	g	h	i	j
														A B D
28/12 06	Hairan Bagh	Said Akhum	Agricult.	47	9	1	0	1	1	3,2	2	1	1	1
"	"	Hassan	"	40	9-10	1	0	1	1	3,1	1	1	0	2
"	"	Kuan	Farmer	55	9-10	1	0	1	1	3,2	2	1-4	2	2
"	"	Niaz Soupper	"	41	9	1	0	1	1	3,3	3	1	2	2
"	"	Mamet Ala	Agricult.	40	9	1	0	1	1	2,1	5	1	2	2
"	"	Goshur	"	25	9	1	0	2	1	1,1	3	2	0	1
28/1 07	Painap	Mullah Aysah	Cook	48	9	1	0	1	1	2,1	2	1	1	2
"	"	Sandja	Mendicant	40	10	2	0	1	1	2,1	1	1	0	1
"	"	Abaydullah	"	30	10	1	0	1	1	2,1	3	1	1	2
"	"	Abulla	"	40	9	2	0	1	1	3,3	3	1	1	2
"	"	Mamet	"	25	9	1	0	1	1	1,1	3	1-2	0	1
"	"	Saydullah	"	20	7	2	0	1	1	0,0	3	2	1	1
29/1 07	"	Muhamat Aut	"	27	10	1	0	1	1	1,1	2	1	0	2
"	"	Mamet	Merchant	30	10	1	0	1	1	1,0	1	1	1	2
"	"	Barat	"	32	9	1	0	1	1	1,1	3	1	1	1
"	"	Sadyk	"	35	9	2	0	2	1	1,1	5	1	1	2
30/1 07	"	Sadyk	Artisan	25	10	1	0	1	1	1,0	3	1-3	0	2
														P A K
20/12 06	Tiznaf	Imail Akhum	Farmer	49	9	1	0	1	1	3,3	2	1-2	1	2
"	"	Kabil	Herdsmen	50	9	1	1	1	-	3,2	3	1-5	1	1
"	"	Mullah Akhum	Farmer	35	9	1	0	1	1	3,3	3	3	1	2
"	"	Akhbay	"	20	9	red-br.	0	5	1	2,1	3	1-3	2	2
														S H I K
20/12 06	Tiznaf	Tudee	Farmer	28	9	1	0	1	1	2,1	2	1	1	2
"	"	Tokhtabai	"	26	10	1	0	1	1	2,1	2-5	1	1	2
"	"	Yaveg	Trader	40	10	1	0	1	1	3,3	2	5	2	2
"	"	Mullahkodja	Farmer	33	10	1	0	1	1	3,1	3	1	1	2
"	"	Tokhta	"	20	9	1	0	1	1	3,1	2	5	2	2
"	"	Anayet	"	16	9	3	0	2	1	1,1	1-2	1	2	2
"	"	Tukhtasyn	"	27	9	1	0	1	1	3,3	3	1-4	1	2-3
"	"	Khali	"	34	9	1	0	1	1	3,3	3	1	1	2
														D O L
8/2 07	Nobesh	Tokhtakhun	Farmer	46	9	1	0	2	1	2,0	3	2	1	2
"	Jochang	Madullakhun	"	27	9	2	0	1	1	2,0	2-3	1	1	2
"	Kumchukal	Garze	"	24	7	1	0	1	1	2,0	2	1	1	2
"	Charbagh	Abdullah	"	20	9	2	0	1	1	1,0	5	1-4	1	2
9/2 07	Tupada	Saidakhun	"	40	7	1	0	1	1	2,2	2	1	2	2
"	Nov	Kuzban Muzal	"	51	7	2	0	1	1	2,1	5	1-2	1	2
"	Maral Bashi	Samsak	"	51	7	2	0	1	1	3,0	3	1-2	1-2	2
"	"	Samsak	"	18	9	1	0	1	1	1,0	3	3	2	3
"	"	Ismailakhun	"	38	9	1	0	1	1	3,2	2	1	2	2
														K A L M
30/5 07	Gedingshan	Munka	—	25	8	2	2	2	1	1,0	5	4	2	2
8/7 07	Tekes	Kota	—	37	8-10	2	2	1	1	1,0	2-5	4	2	1
25/6 07	Dayen Shela	Kaun	—	51	9	2	2	1	1	2,0	3	3	2	1
30/5 07	Gedingshan	Arasha	—	22	8	2	2	1	1	1,0	5	5	1	1
"	"	Ankedjirgill	—	20	8	1	3	1	1	0,0	5	5	2	2
"	Tsagan usun	Hotan	—	50	8	1	0	1	1	1,0	5	1-5	1	1
"	"	Toghluck	—	50	8	1	1	1	1	2,0	3	5	1	1
29/5 07	"	Turvat	—	29	8-9	1	2	1	1	1,0	2	1	2	2
"	"	Sota	—	23	8-10	1	3	1	1	0,0	3	1	3	4
30/5 07	Urtu	Satur	—	25	8	1	2	1	1	1,0	3	1	1	1
"	Khunakhay	Ulzamunk	—	20	8	1	2	1	1	0,0	5	5	2	1
"	"	Surun	—	33	8	1	1	1	1	1,0	5	1-3	1	1
29/5 07	"	Hatshe	—	23	8	1	3	1	1	0,0	1	1	1	3
"	"	Turvat	—	29	8	2	2	1	1	1,0	2	5	2	3
"	Khargontu	Dshingill	Officer	23	8	1	2	1	1	1,1	5	1	1	2
"	"	Khotintsagan	—	25	8	1	2	1	1	1,0	5	1-3	2	3
30/5 07	"	Sata	—	30	8	1	1	1	1	1,0	2	1-3	2	2
"	"	Tula	Officer	41	10	1-2	0	1	1	1,0	2	2	1	2

PHYSICAL ANTHROPOLOGY OF SOME PEOPLES

k	1	2	3	4	5	6	7	8	9	9a	10	11	12	13	14	15	16	17	18	19	20	Gen. cond.
A L S																						
3	184	154	52	37	117	192	212	138	141	122	757	472	178	248	833	1223	1699	1404	1353	77	1671	3
3	204	154	51	43	129	208	219	135	143	122	775	490	205	260	916	1308	1685	1458	1317	74	1780	3
2	192	158	46	40	119	197	208	142	143	116	753	464	182	248	795	1146	1543	1348	1255	87	1630	3
4	186	156	44	37	127	191	227	129	145	121	742	453	231	243	882	1243	1646	1428	1321	87	1672	2
3	185	148	51	39	103	167	193	126	139	118	676	403	163	184	826	1174	1538	1289	1231	71	1500	2
4	187	148	54	39	109	114	203	124	147	121	704	439	181	247	864	1148	1570	1359	1296	81	1600	1-2
4	187	149	54	33	108	177	207	125	145	125	748	460	180	246	875	1267	1702	1484	1396	81	1680	2
2	177	146	40	34	103	174	219	127	133	109	857	516	188	224	878	1297	1790	1559	1467	80	1870	3
4	191	152	43	38	108	192	234	116	149	132	736	465	169	243	902	1241	1657	1444	1350	78	1670	2
4	177	139	41	31	109	169	212	124	136	114	753	486	176	248	817	1198	1689	1478	1367	73	1710	3
4	165	137	43	35	110	138	181	118	134	102	669	424	163	225	790	1110	1497	1318	1218	62	1520	3
2	172	148	46	37	129	184	224	133	138	112	688	432	163	207	840	1166	1580	1352	1287	71	1540	2
2	194	156	49	37	130	182	222	147	139	103	727	436	172	257	919	1220	1630	1488	1306	78	1612	3
3	182	145	50	34	119	186	222	125	143	122	778	463	173	243	900	1257	1695	1483	1380	81	1751	3
3	181	159	49	35	119	188	221	127	154	116	754	468	177	252	878	1261	1690	1493	1378	82	1753	2
4	177	149	44	34	114	159	208	115	143	108	690	417	164	226	830	1173	1570	1368	1288	76	1536	2
3	182	154	48	38	123	190	176	121	142	107	710	435	172	233	843	1223	1610	1488	1296	76	1608	2
H P O																						
4																						2
4																						2
3																						2
4																						2
S H O																						
3																						2
4																						2-3
3																						2
4																						2
3																						2-3
2																						2
3-4																						3
3																						3
A N S																						
4	194	147	52	34	114	184	224	122	134	121	688	430	165	235	804	1178	1536	1328	1227	72	1520	2
4	187	159	53	40	121	198	236	128	153	119	792	487	186	264	906	1317	1737	1500	1396	76	1786	2
4	189	161	57	43	130	194	232	127	146	126	766	482	192	207	860	1238	1713	1448	1353	80	1738	2
3	178	164	58	38	131	189	237	134	144	119	760	491	187	258	896	1301	1720	1480	1391	82	1740	2
4	203	154	59	39	131	204	237	127	150	124	809	520	198	262	868	1275	1722	1479	1398	94	1821	2
4	178	163	57	39	105	170	207	112	148	117	763	484	178	243	842	1240	1660	1418	1348	89	1742	2
5	177	161	54	41	—	172	213	127	149	122	758	479	182	247	801	1217	1655	1442	1330	83	1693	2
4	186	153	49	37	123	182	214	117	141	117	699	440	160	220	849	1199	1562	1340	1243	74	1570	2
4	189	159	45	37	121	180	222	128	145	126	734	469	180	245	851	1259	1652	1451	1372	86	1688	2
U K S																						
5	173	159	49	34	118	181	216	123	150	113	750	470	180	242	858	1213	1617	1431	1315	73	1761	3
5	179	168	55	42	129	189	235	132	155	126	810	488	192	267	880	1340	1789	1568	1460	88	1936	2
5	176	156	46	37	122	191	231	108	147	108	674	415	159	224	817	1151	1520	1295	1212	76	1564	2
5	187	146	47	35	109	186	216	123	140	104	666	423	175	237	806	1132	1500	1312	1223	73	1545	2
4	179	159	48	38	116	186	217	114	149	110	729	446	179	238	837	1171	1579	1372	1295	72	1666	2
5	177	162	50	34	127	189	225	120	147	109	698	445	164	—	819	1168	1562	1356	1287	—	1676	2
5	193	166	53	40	98	197	228	122	160	127	742	462	180	249	866	1250	1680	1457	1366	81	1750	2
4	188	151	46	37	97	169	217	113	148	111	684	420	161	232	825	1148	1510	1293	1245	70	1597	2
5	182	159	49	39	118	191	231	116	158	114	780	492	186	269	878	1246	1673	1452	1355	88	1842	2
4	201	160	46	40	127	203	230	118	155	106	677	444	165	238	868	1208	1587	1386	1292	77	1612	2
5	178	158	50	31	116	200	213	117	148	112	678	420	162	231	808	1151	1535	1340	1265	72	1611	3
4	187	167	51	38	118	187	234	123	158	120	720	438	173	243	875	1206	1614	1394	1333	76	1681	2
4	194	149	54	34	116	188	239	127	146	127	770	485	174	252	918	1302	1738	1513	1441	82	1800	2
4	179	166	53	39	106	194	231	126	155	118	730	452	173	233	860	1218	1592	1389	1310	87	1694	2
4	190	161	52	35	98	178	231	119	161	125	778	485	188	263	969	1339	1771	1557	1459	78	1862	2
4	186	159	51	38	120	206	240	129	159	123	761	465	178	247	854	1240	1628	1406	1334	80	1723	2
4	179	152	48	35	117	195	225	124	149	117	712	452	173	244	829	1191	1603	1377	1303	69	1699	2
3	187	169	49	39	113	188	230	123	157	115	752	465	171	243	823	1200	1606	1402	1313	69	1760	3

PHYSICAL ANTHROPOLOGY OF SOME PEOPLES

k	1	2	3	4	5	6	7	8	9	9 a	10	11	12	13	14	15	16	17	18	19	20	Gen. cond.
U K S																						
4	184	170	52	33	120	196	238	121	163	123	769	487	173	258	894	1291	1712	1482	1394	76	1792	3
4	189	161	55	32	111	191	231	129	158	130	770	477	176	248	851	1232	1646	1417	1343	75	1821	2
4	193	152	53	37	112	192	229	123	147	127	680	445	171	249	870	1060	1549	1346	1237	75	1613	2
5	168	153	48	33	109	169	217	112	146	114	699	446	179	248	845	1175	1560	1349	1257	71	1660	3
4	177	140	48	33	129	179	224	121	148	112	680	425	163	236	849	1172	1545	1338	1258	79	1590	2
3	184	—	49	34	98	188	229	117	155	116	694	431	162	224	832	1164	1554	1360	1282	70	1630	2
3	184	162	54	38	129	191	226	126	148	109	775	484	191	258	843	1223	1648	1439	1322	77	1832	2
5	182	157	53	37	110	184	237	126	150	123	732	457	173	233	867	1208	1614	1412	1313	75	1698	3
5	193	162	50	36	125	202	230	133	151	125	790	506	186	265	920	1283	1722	1500	1425	86	1848	3
4	194	158	47	39	127	204	243	138	156	120	766	480	179	250	912	1290	1704	1477	1402	88	1780	2
4	190	161	43	32	118	192	234	132	151	111	729	463	179	243	872	1225	1639	1416	1352	73	1708	2
3	177	148	41	31	92	164	196	107	146	103	698	438	170	235	812	1162	1544	1348	1262	70	1630	2
5	200	164	52	39	112	192	239	127	166	122	761	462	169	248	866	1187	1611	1386	1302	66	1786	2
4	187	153	45	37	118	186	225	131	150	110	709	443	163	234	851	1230	1638	1408	1343	78	1702	2
4	186	168	53	38	110	187	240	125	163	118	758	456	166	248	845	1218	1639	1414	1342	75	1757	2
5	196	159	52	38	103	197	243	132	159	118	782	487	179	256	889	1254	1693	1483	1390	82	1821	2
4	185	166	56	33	104	184	228	117	160	125	778	483	180	246	864	1225	1646	1442	1363	81	1811	2
4	187	167	50	38	108	179	231	118	154	112	695	424	167	243	842	1188	1602	1372	1303	74	1656	2
5	197	167	50	41	106	176	231	127	153	126	705	463	171	250	850	1208	1626	1386	1300	79	1690	2
H I Z																						
4	178	159	61	34	86	177	208	115	148	108	743	447	178	229	848	1188	1608	1409	1336	73	1700	2
5	184	153	47	34	90	158	197	116	153	90	713	432	163	224	822	1166	1541	1333	1256	72	1655	2
3	185	162	53	38	121	184	226	134	153	112	759	483	170	257	896	1255	1686	1488	1322	79	1758	2
4	185	162	50	36	113	169	219	134	149	103	753	464	173	236	858	1204	1612	1399	1301	69	1559	2
5	189	167	57	39	103	177	210	112	149	116	720	469	184	241	846	1282	1621	1399	1325	78	1708	2
4	198	161	52	38	104	185	225	128	150	109	759	455	175	254	910	1262	1699	1488	1388	76	1776	2
4	184	177	53	38	104	188	222	134	158	106	751	454	172	237	839	1202	1631	1413	1323	76	1724	2
3-4	182	155	46	34	113	189	214	123	147	112	748	477	171	234	853	1217	1647	1434	1352	74	1720	2
4	188	157	53	35	109	178	221	124	152	123	740	478	176	237	827	1215	1636	1415	1324	79	1737	2
4	183	163	52	41	119	188	227	135	163	117	769	480	177	264	911	1248	1671	1458	1355	70	1776	2
4	193	164	49	38	127	169	227	126	154	115	754	454	166	229	867	1200	1647	1446	1351	73	1686	3
3-4	184	159	49	37	121	180	227	128	162	114	730	446	163	228	897	1232	1632	1421	1320	79	1660	2
4	180	159	53	34	119	191	213	123	142	108	743	465	178	229	817	1179	1615	1409	1310	72	1708	3
4	197	166	59	43	129	203	217	132	157	117	780	495	206	267	915	1267	1699	1470	1383	79	1790	2
5	191	177	54	39	136	217	254	137	151	123	757	453	172	244	882	1257	1692	1444	1361	77	1762	2
3	198	159	47	38	89	178	214	115	149	119	780	492	182	247	897	1250	1695	1487	1374	80	1780	2
3	193	163	50	39	68	177	223	136	148	109	735	460	172	232	860	1198	1623	1418	1317	73	1724	3
5	194	162	54	38	86	175	211	117	157	109	704	458	172	244	850	1217	1631	1431	1323	80	1683	3
4	184	162	53	38	103	179	207	124	145	106	788	490	183	248	926	1304	1738	1547	1452	84	1844	3
5	190	162	50	42	122	168	227	124	152	121	721	449	171	238	844	1225	1626	1412	1350	84	1668	2
3	184	169	54	40	127	181	237	123	152	117	703	433	166	234	846	1192	1582	1351	1260	84	1628	2
5	189	168	52	40	106	180	237	119	158	122	732	448	175	241	856	1199	1612	1397	1305	83	1731	2
5	193	159	52	40	110	183	220	129	156	115	818	503	193	270	881	1306	1772	1561	1458	87	1890	2
5	190	169	53	39	126	198	244	137	157	124	757	470	169	247	911	1257	1686	1456	1376	77	1806	2
4	189	169	53	46	113	186	243	129	158	122	757	482	187	261	893	1260	1694	1467	1365	82	1773	2
5	192	169	47	38	117	171	219	123	157	117	729	456	171	242	852	1198	1607	1398	1317	76	1705	2
5	198	158	50	41	113	184	226	120	158	112	780	479	184	259	910	1262	1733	1516	1436	81	1789	2
5	192	168	52	38	128	196	232	114	157	119	778	485	183	249	850	1192	1623	1392	1349	74	1880	2
4	187	167	55	42	101	169	219	122	157	118	789	494	187	258	953	1307	1787	1542	1443	83	1810	3
U T S																						
5	187	147	51	38	121	198	239	129	148	122	732	457	182	238	881	1256	1662	1430	1356	84	1761	2
5	190	168	50	38	102	189	222	130	149	127	696	434	160	234	806	1186	1566	1370	1290	78	1680	3
5	188	151	54	40	114	192	230	118	147	126	729	455	176	229	867	1227	1639	1408	1311	83	1740	2
5	181	158	57	38	114	182	221	123	147	124	728	464	174	248	887	1254	1671	1434	1320	82	1734	2
4	183	149	50	39	111	175	218	114	138	118	727	447	170	237	811	1240	1592	1385	1285	81	1679	2
4	178	157	44	38	121	180	220	121	149	102	700	436	168	231	882	1250	1642	1419	1312	78	1650	3
4	177	157	52	41	123	188	226	124	152	121	747	473	176	232	844	1229	1646	1441	1340	82	1762	2
4	191	158	53	38	103	169	218	126	158	126	759	482	179	249	863	1246	1662	1449	1361	83	1783	2
5	187	157	45	48	107	166	218	121	150	114	705	438	178	239	812	1183	1555	1331	1265	80	1659	2
4	180	165	52	35	103	177	224	129	154	121	756	463	176	248	910	1288	1740	1494	1400	82	1800	2
5	189	175	53	39	107	189	228	133	169	128	753	468	186	248	915	1263	1690	1458	1395	85	1788	1
5	187	152	52	37	92	172	224	120	156	126	768	478	186	252	884	1235	1676	1436	1368	79	1813	1

KAARLO HILDÉN

Date	Locality	Name	Profession	Age	a	b	c	d	e	f	g	h	i	j
T O R G														
27/6 07	Yulduz	Tundö	—	37	9	1	2	2	1	2,0	5	1-5	2	2
"	"	Damba	—	34	9	1	2	1	3	1,0	2	4	2	2
"	"	Pountsouk	—	40	10	2	0	2	1	1,0	5	1	2	2
"	"	"	—	40	9	1	2	1	1	1,0	2	1	1	2
"	"	Chemat	—	19	9-10	1	2	2	1	0,0	5	1	2	2
"	"	Erantsen	—	25	10	1	2	1	1	2,0	5	1-2	2	2
"	"	Choen	—	23	9	2	2	1	1	1,0	5	1	2	1
"	"	Djap	—	26	7-9	2	2	2	1	1,0	3-5	1	2	1
"	"	Dava	—	28	9-10	1	2	1	1	2,1	3-5	1	2	1
"	"	?	—	30	3	3	2	1	1	1,0	3	3	2	1
"	"	"	—	20	9	1	2	1	1	1,0	3	1	2	2
26/6 07	"	Saka	—	21	9	2	2	1	1	1,0	5	1	2	2
"	"	Chapel	—	28	7-9	1	1	1	1	1,1	3	4	2	2
"	"	Osur	—	21	9	1	3	1	1	1,0	3	1-3	2	1
"	"	Alim	—	21	9	2	3	3	1	0,0	3	1	2	1
"	"	Damcha	—	24	7-9	2	2	1	1	1,1	3-5	1	2	2
"	"	Lusung	—	29	7-9	1	2	2	1	1,0	3-5	2	2	2
25/6 07	"	Tseran	—	35	9	1	1	1	1	2,1	2	1	1	1
"	"	Hagdje	—	22	9	1	3	2	1	1,0	3-5	1	1	2
"	"	Lusung	—	21	9	1	3	1	1	1,0	3-5	1	2	3
"	"	Loten	—	23	7-9	2	3	2	1	1,0	5	1	2	3
"	"	Cheru	—	22	9-10	4	3	2	1	1,0	2	1	2	3
"	"	Pirla	—	34	7	2	2	2	1	2,1	3	3	1	2
"	"	Arevuk	—	25	9	2	2	1	1	1,0	5	5	2	3
"	"	Adja	—	35	9	2	2	1	1	1,1	3-5	4	1	2
"	"	Lotsuk	—	19	9	1	2	1	1	1,0	1	1	2	2
"	"	Choglung	—	29	9	1	2	1	1	1,0	5	1	2	2
"	"	Cherup	—	22	7	1	2	1	1	1,0	3	1	1	2
"	"	Dardsja	—	29	7	2	1	1	1	2,1	2	4	1	1
17/6 07	"	Tanzen	—	20	9	1	2	1	1	1,0	3	1-3	1	2
"	"	Danzen	—	23	9	2	2	1	1	1,0	5	5	2	1
"	"	Galik	—	20	9	1	3	1	1	1,0	3	1	2	2
"	"	Kunges	—	35	8	1	1	1	1	1,0	2	6	2	2
"	"	Chuden	—	25	9	2	3	1	1	1,0	3	4	2	2
"	"	Batma	—	20	9	2	2	1	1	1,0	5	3	2	2
"	"	Sherep	—	21	9	1	2	1	1	1,0	3	1	2	2
"	"	Samka	—	30	8	2	1	1	1	2,0	3	1	2	1
"	"	Liedja	—	25	8	1	1	1	1	1,0	3	1	1	2
Y Ö G														
27/12 07	Tatungsu	Stoptshenzu	Herdsman	20	8-10	1	2	1	1	1,0	1-5	1	1	1
"	"	Kegé	"	26	10	1	1	1	3	1,0	1-5	1-2	0	2
"	Hambel	Nortshap	"	54	10	1	1	1	2	1,0	3	3	0	2
28/12 07	Kanglungsu	Louzan	Lama	27	8	1	1	1	3	1,0	2	1-2	0	2
"	"	Dsjamsu	"	"	"	"	"	"	"	"	"	"	"	"
"	"	Hualda	"	16	7	1	2	1	1	1,0	2	1	0	2
"	"	Tiejsangpan-djá	"	21	7	1	1	1	1	1,0	2	1	2	3
"	Löngtjiá	Mingur dord-jia	Herdsman	60	8	7	0	1	1	1,0	1	1	1	2
"	Kanglungsu	Derdjivé	Lama	42	7	1	0	1	3	1,0	3	1	2	2
"	"	Hundjúp	"	32	10	2	1	1-2	1	1,0	3	1-6	1-2	2
"	"	Hörwu	"	23	7-9	2	2	1	3	1,0	2	1	1	2
"	"	Tiambul dord-jia	"	30	9	2	1	1	1	1,0	3-5	1	1-2	2
"	"	Dondja	"	20	7-9	2	1	1	1	1,0	2	3	1	2

PHYSICAL ANTHROPOLOGY OF SOME PEOPLES

k	1	2	3	4	5	6	7	8	9	9 a	10	11	12	13	14	15	16	17	18	19	20	Gen. cond.
U T S																						
5	187	159	51	39	99	178	213	131	151	119	741	470	181	248	880	1233	1673	1438	1466	79	1736	2
4	193	163	50	39	112	188	233	121	151	124	753	480	189	252	911	1281	1727	1484	1397	82	1800	3
5	187	168	51	39	99	182	224	121	155	121	730	451	171	232	794	1176	1597	1357	1298	69	1691	2
4	183	158	51	39	114	187	228	122	155	121	790	487	181	246	808	1285	1763	1525	1421	83	1861	2
5	182	158	49	38	103	179	227	120	151	109	751	468	183	256	863	1255	1721	1503	1407	79	1758	3
4	187	158	53	39	99	186	228	112	150	118	710	439	171	237	881	1221	1657	1423	1350	81	1656	2
5	182	158	51	37	108	181	222	119	156	128	766	479	180	250	896	1256	1688	1469	1382	70	1794	3
5	190	159	45	35	115	176	223	128	151	118	738	451	171	244	900	1272	1722	1465	1413	78	1725	2
5	185	169	51	42	109	171	217	123	157	117	720	448	167	229	843	1204	1596	1371	1277	83	1671	2
5	182	145	50	35	100	165	211	118	147	111	698	451	168	247	893	1251	1660	1446	1362	71	1649	3
5	190	162	50	39	113	187	227	129	157	119	787	498	190	257	936	1313	1725	1530	1432	80	1834	2
5	180	153	47	36	108	176	215	128	139	111	740	458	183	260	796	1205	1641	1442	1352	72	1702	-
4	184	166	51	37	112	179	220	128	153	117	791	476	182	238	878	1281	1692	1462	1374	82	1825	2
4	189	160	45	41	105	179	214	124	152	111	676	411	164	221	808	1136	1570	1291	1217	78	1576	-
5	172	157	48	38	100	170	201	113	152	112	760	467	175	243	821	1228	1656	1454	1332	75	1751	3
5	181	156	51	38	111	192	220	127	151	114	722	457	174	244	857	1252	1653	1428	1358	71	1478	2
5	182	158	49	37	126	192	229	133	148	117	720	431	156	227	845	1160	1568	1345	1258	72	1648	1
5	184	153	51	38	119	182	227	127	157	122	749	445	172	233	888	1242	1656	1444	1336	79	1745	1
4	182	161	48	35	121	185	215	127	152	115	673	418	160	228	821	1150	1577	1319	1233	68	1579	2
5	181	158	50	38	99	188	217	124	155	113	667	409	160	231	840	1187	1567	1360	1269	79	1560	3
5	177	151	47	39	107	174	227	118	143	117	719	449	177	243	855	1197	1608	1376	1304	82	1653	2
4	179	158	50	36	117	178	225	119	148	124	732	453	179	244	882	1238	1663	1447	1364	85	1700	2
4	190	171	54	43	119	190	225	122	159	120	760	482	185	248	898	1282	1710	1481	1371	85	1802	1
5	188	158	49	39	108	181	224	118	149	130	776	465	177	242	895	1320	1741	1522	1420	87	1801	2
5	189	166	52	36	107	184	231	123	156	121	772	473	179	245	895	1238	1693	1457	1377	86	1765	1
4	174	140	48	35	109	169	223	114	134	122	738	460	181	251	849	1211	1632	1409	1318	72	1740	3
5	191	157	50	39	112	191	244	121	152	130	766	475	179	247	875	1293	1715	1458	1391	76	1817	2
3	183	160	43	36	99	169	236	113	148	115	716	418	157	223	862	1221	1640	1382	1316	83	1642	2
5	182	145	52	32	89	172	210	108	139	108	728	457	171	223	820	1273	1575	1357	1271	67	1705	3
4	188	171	52	38	124	181	235	124	158	123	756	465	178	252	872	1248	1674	1419	1362	80	1774	2
4	190	166	57	38	118	192	222	129	153	122	740	464	178	249	900	1299	1744	1512	1434	85	1760	2
5	180	158	50	35	107	187	217	127	156	108	777	488	189	260	857	1244	1685	1479	1384	86	1818	2
5	176	154	48	32	124	185	239	122	157	119	752	469	182	247	852	1252	1691	1467	1414	79	1555	2
4	183	153	49	36	115	178	232	128	151	120	770	483	189	263	897	1231	1746	1497	1420	83	1527	2
5	188	153	44	37	114	183	228	137	147	119	712	446	169	225	863	1235	1634	1406	1345	87	1695	2
5	196	153	49	35	118	202	238	128	159	122	800	499	198	259	919	1313	1756	1533	1424	79	1840	2
4	183	157	52	34	113	180	218	122	156	120	698	439	170	231	829	1188	1598	1372	1295	69	1671	2
5	192	157	50	38	118	185	222	121	151	123	767	490	183	253	967	1324	1775	1521	1423	80	1783	2
U R S																						
2-3	192	148	53	39	121	204	232	137	146	124	737	457	179	250	872	1230	1618	1393	1323	83	1686	2
3	178	143	52	30	102	177	226	113	136	122	750	466	181	241	864	1232	1652	1434	1346	72	1738	3
4	198	159	49	44	122	194	219	132	153	118	729	480	181	251	895	1223	1670	1440	1355	84	1710	2
4	197	146	47	38	131	202	238	128	148	119	778	485	187	262	910	1249	1700	1460	1360	82	1770	2
4	178	145	51	40	99	180	222	126	146	113	736	462	180	248	892	1206	1628	1408	1329	84	1703	2
3	182	153	43	37	112	174	217	125	147	114	682	408	158	232	870	1192	1596	1380	1287	70	1610	3
2	187	139	52	39	115	194	224	124	138	119	711	457	180	243	816	1197	1600	1365	1295	77	1682	3
4	199	157	52	39	137	219	250	142	151	127	787	485	194	251	908	1220	1692	1472	1387	85	1805	2
4	192	146	53	39	99	175	227	119	147	134	697	422	165	227	820	1170	1573	1387	1273	79	1589	2
4	194	158	53	38	119	186	227	121	154	129	767	473	183	250	880	1281	1730	1485	1387	86	1797	2
4	187	158	52	41	115	183	215	115	152	127	725	459	173	236	820	1167	1602	1398	1323	75	1676	3
4	195	158	50	39	127	199	232	128	153	121	759	468	174	244	851	1196	1663	1413	1344	87	1723	-

**MANNERHEIM'S COLLECTION OF SART
SPECIMENS**

BY

KUSTAA VILKUNA

During the years 1906—1908, while travelling in Asia, Baron MANNERHEIM made an ethnographic collection, consisting of about 1000 catalogued objects, now preserved in the Foreign Section of the Finnish National Museum (Nos. 4803 and 4433). The most important part of this collection consists of specimens obtained from the *Sart* inhabitants of the towns of Kashgar, Yarkand, Karghalik, Guma, Khotan, Uch Turfan and Hami and of the villages of Kurshak and Kushlak, situated in the western part of Eastern Turkestan. There are some objects from the Sarts of Osh and Uz Kent, situated in the Ferghana valley, and also a considerable number of Mongol and Kirghiz objects from Turkestan and from the interior of Central Asia. These have been described by MANNERHEIM himself in his »A visit to the Sarö and Shera Yögurs», (*Journal de la Société Finno-Ougrienne* XXVII: 2, 1909); and for this reason the present essay will deal only with the objects connected with the Sarts.

The appellation *Sart* is used by the Russians and by the nomadic tribes of Central Asia to denote the permanently domiciled aborigines of Western Turkestan. The term *Sart* (*sarta*, *-gul*, *-ul*, *-ol*), which is probably of Indian origin, has often changed its meaning in the course of time. The Turks applied this term in the eleventh century to merchants, in the twelfth to all Iranians, in the fifteenth to Persians, and since the sixteenth to the conquered aborigines of Turkestan. The Mongols have known the name *Sart* since the thirteenth century and use it to denote peasants who make use of irrigation canals, as well as merchants, since from the Mongol point of view a settled peasant is also a merchant, because it is possible to purchase wheat, fruit, etc. from him. Later the Mongols began to use the same name in connection with the peasant Tajiks, which is still their custom. (In Turkestan it is very difficult to distinguish between Sarts and Tajiks.) The name *Sart*, as used by the Russians, has become generally adopted in scientific works. However, with Russia's adoption of the Soviet form of government, the use of this term as an ethnic name has been discontinued, because the permanently domiciled inhabitants of Central Asia and Uzbekistan do not approve of it and consider it derogatory. The name is therefore gradually disappearing. In his diary MANNERHEIM uses the term also to denote the settled inhabitants of Eastern Turkestan who are neither Chinese nor Mongols. According to him, the Sarts of Eastern Turkestan are more Iranian in appearance than the Sarts of Western Turkestan.

Some Russian ethnologists consider the Sarts to be a separate people differing in origin from the Turkish Uzbeks and the Iranian Tajiks. Probably they are of Iranian origin, but, after being conquered by the Uzbeks, they lost their language and racial purity by intermarriage with their Turki and Mongol conquerors. Their language, the *Sart-tili*, is basically Turki, but differs sharply from the Uzbek, Kirghiz, Tartar and Turkish languages. According to P. I. LERCH, it resembles most the book language of the Dagatai, but in certain respects it appears to have much in common with the popular speech of the Uzbeks and the Kirghiz.¹

The Russian scholar N. P. OSTROUMOV, who spent over thirty years in Turkestan and has published many treatises on the subject of the Sarts, whom he considers to be a people differing comparatively clearly from the other peoples of Turkestan, describes them as follows:²

They are of more than average height (1691 mm. for men, 1510 mm. for women, as compared to 1666 mm. for Uzbek men). They are healthy looking and often tend to be fat. The colour of their skin is dark; the hair black; the colour of the eyes dark brown; and the beard thin. The Sarts are true brachicephalics, the index of the head being 85.39 (as compared to the 83.10 Uzbek index). The skull is small; the forehead of average size; the eyebrows arched and bushy. The eyes are set far apart. The nose is straight, but sometimes hooked. The face is generally oval. On the basis of their facial characteristics the Sarts are a mixed people, because among them one often sees pure Iranian features side by side with Turko-Mongolian characteristics; both of which are easily distinguishable from European faces. The hands are often remarkably small; the fingers thin and long, with an almost transparent fragility. The bodily motions are subdued and quiet, even to the point of being slack. They are performed in accordance with social standing. The upper and the well-to-do classes must not move about hastily. The dignity of behaviour is further accentuated by the long *khalatti* cloak, by the stately and heavy turban (*tšalma*), and by the intricate *išig*, footwear, which retard the movements of the head, feet and trunk. In his home and among friends the Sart is lively and active, for his usual apathetic appearance is only affected. The motions of artisans are graceful, nimble, fluent and sparing of energy.

Their mental endowments are considerable. Especially in practical matters the Sarts are capable of initiative, and they are in addition particularly well fitted for skilled manual labour. They are clever wood and metal engravers, and as masons and moulders they enjoy a high reputation among the Russians. They are gifted also as merchants, as every Sart is prone to engage in some exchange of goods. As tillers of the soil they are well adapted to the hot climate and to hard labour. The Sarts are fundamentally industrious, peace-loving and easily led by others. Among themselves they are often jealous, and their worst quarrels are usually caused by disagreement concerning the use of irrigation water.³ Being Mohammedans, they are self-confident and contemptuous of Russians. They are disinclined to express their feelings freely. In eating and drinking they are moderate and temperate, characteristics which, like their honesty, are expressed in their faces.

Their home life is patriarchal and the domestic etiquette of the rich is strict and in

accordance with the Koran. In the family the aged are respected, children are loved and infants are tenderly cared for. The family feasts are sumptuous and expensive banquets. If there is a lack of funds, such occasions as, for instance, the celebration of circumcision, may be long postponed. The homes of the rich differ very little from the homes of the poor. The dwellings of both are thoroughly primitive clay huts.

The women of the rich are restricted to their own environment even more than those of the poor. The position of women is generally rather low.⁴ The evidence of one woman carries no weight in the courts. The rich can change their wives whenever they feel inclined. One of the most characteristic features of their social life is the segregation of men and women into strictly isolated groups. Meetings of men and women hold their evening sessions (*dšura*) separately. Polygamy is more highly developed among the Sarts than, for instance, among the Kirghiz; however, only the rich can afford to keep several wives. The poorer part of the population sell their daughters to the rich at ridiculously low prices (*kolym*).

The bazaar plays an important part in their communal life,⁵ for it is there that acquaintances meet, news is exchanged and rumours are spread. The bazaar is at its liveliest on the night of the feast of *Ramazan*, when great crowds collect in the towns. At such times jesters (*azkija*) and singers (*hajiž*), who also tell stories, appear. In the tents acrobatic tricks, stunts and puppet shows are performed, and all kinds of tales are put into the mouths of the puppets. The tea-houses are crowded and the blare of musical instruments is heard. On such occasions, too, the paederastic *badja* (*badža*), young boys, can also be seen. These boys entertain strangers with dancing⁶ and for a certain sum they accompany such men as may desire them (*badžebaz*). The boys wear silken garments and are pink-cheeked like women. When they are 20—25 years of age, they too become *badžebaz* and begin to consort with boys. This vice is widespread although the *kazi* are attempting to destroy it by appealing to the authority of the *sarjat*. Under Russian rule prostitutes have to a great extent displaced the *badža*-boys. Another public vice is the use of drugs which have harmful effects on those who indulge in them. Among the drugs that are especially widespread even among the poor are *anasha* or *hashish*, prepared from hemp, and *koknar* (*kuknar*), an infusion of poppy-heads, pounded and pressed through linen. *Anasha* is smoked and drawn deep into the lungs. In addition, *khav* or *khar*, a mixture of hashish and opium in the form of pills (opium is imported from Bokhara and China), *bartsh*, a compound of opium and pepper, *tarjak*, a hashish marmalade that is washed down with hot tea, and *gulkand*, hashish either candied or prepared with honey, should be mentioned.⁷⁻⁸ (There are samples of these in the Mannerheim collection.)

The Sarts are also fond of gambling,⁹ e.g., dice-throwing and card-playing. Quail and partridge fighting is also popular. In the spring athletic meetings are usually held, especially wrestling bouts, in which the winners receive from the public all manner of gifts, mostly money and *khalatti*'s.

Agriculture and cattlefarming are at a rather primitive stage. The favourite animal is the horse, though it is treated roughly in drawing arbahs and in riding. During the winter almost the whole supply of hay is given to the horses. The cows are given only the surplus, so that in the spring they are lean and wretched.

The houses are small and close to each other.⁹ The rooms have neither windows nor stoves, and are warmed only by burning coal in braziers. The Sart dwelling as a whole is very unhygienic; there is dung everywhere and clean water is scarce. The Sarts are saved from many diseases only by spending much time in the sunshine out-of-doors. The native physicians (*tibibi*) offer quack cures for skin diseases, among which the so-called Sart-disease (*paša, churda*) is very widespread.

Socially the population is divided into three classes: (1) manual labourers and tillers of the soil, (2) merchants, (3) representatives of the *sarjat* (ecclesiastical courts) and of Mohammedan science (*kazi, agljami, mufti, imam, išan* or *dervişi, muddarrisi* and *mullah*). The representatives of the *sarjat* and science usually gain a livelihood by their profession, but in addition many of them engage in farming.

The Sarts are ardent Mohammedans; piety is the most fundamental feature of their nature. They receive their elementary schooling in the *mektebe*, and then continue their studies in the *madresse*.¹⁰

The literature of the Sarts is limited to sacred books, several historical works, and translations of Persian poetry. Their own poets have not created anything great; there are, however, poems in existence dealing with the conquest of the Sart towns. In these poems the officials and the great armies of the Sarts are reproached for their cowardice and their opponents praised for their bravery. The tales, proverbs and songs of the Sarts greatly resemble similar literature among the Turkish tribes living in Tjon-Sani and in Eastern Turkestan.

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2. Н. П. Остроумовъ, Сарты. Этнографическіе матеріалы (Общій очеркъ), Tashkent 1908.
3. With regard to irrigation canals (*ariqs*) see C. G. MANNERHEIM, *Records of the Journey*, p. 14.
4. Cf. MANNERHEIM, *Records*, p. 50.
5. Cf. MANNERHEIM, *Records*, pp. 13, 62, 71.
6. Concerning *badja* dances see also MANNERHEIM, *Records*, pp. 17, 18.
7. See also A. VON MIDDENDORFF: *Einblicke in das Ferghana-Thal*, *Mém. de l'Acad. Imp. des Sciences de St. Pétersbourg*. VII série, T. XXIX, pp. 241—242.
8. See also MANNERHEIM, *Records*, pp. 75, 76.
9. See MANNERHEIM, pp. 12, 19, 47, 48.
10. Cf. MANNERHEIM, *Records*, pp. 15, 16, 49, 76.

P L A T E S

Plate I.

1. Child's cradle, containing a mattress, blanket and 2 wide runners with bands for fastening in the child. In the middle the ends of 2 wooden tubes are visible; the one like a pipe is for a boy and the longer one for a girl. The tube is placed between the legs in order to convey the urine into a vessel under the cradle. Eastern Turkestan.

2. The same cradle with the cover put up. Cradles of this type are very common among the people of Persia, the Caucasus and Asia Minor. Mongolian cradles have only a hollowed-out trough, similar to those forming the body of the Laplanders' cradles.

3. A child's khalatti of red, striped cotton cloth. Osh.

4. Child's drawers of white cotton with red and black dots printed on it (see Pl. XII). Eastern Turkestan.

5. Child's high boots of soft leather and dark colour. Green strips on the edges. Eastern Turkestan.

Plate II.

1. Large hemispherical woman's cap of gold brocade; knob with brown beads sewn on. This is worn by women only on festive occasions. Hami.

2. Skull-cap sewn of four pieces of black cloth (*tšapak buk*) for men. Simple embroidery. Turfan.

3. Black embroidered skull-cap (*tšapak duppa*) of the same kind for both sexes.

4. Skull-cap (*gutsken tavar buk*) for children. Red ground except one gore which is blue and brings luck. Turfan.

5. Skull-cap of green velvet with brocaded edge; for women. Turfan.

6. Leather cap (*tomak*) covered with green velvet (see Plate III: 5). Worn by women out-of-doors in summer. Kashgar.

Plate III.

1. Parti-coloured skull-cap. A turban can be worn round it. Osh.

2. Men's embroidered skull-cap of black cloth. Worn under a turban. Osh.

3. Turban of white cotton. Osh.

4. Cap made of four pieces of felt. Worn by peasants over a skull-cap. Kushlak.

5. Leather cap (*tomak*) worn without cloth covering. (Compare Plate III: 6.) Worn by men in winter. Kashgar.

6. Helmet of white leather with the hair on the inside (*kulaktši*). Worn by peasants and especially by hill-tribes. It is also very common among the people of the steppes; it can be seen in pictures of the Scythians in ancient times. Khotan.

Plate IV.

1. Red and white silk shirt worn by women. Worn next to the skin. Dyed by the *ikatten* process which is well-known especially in the East Indies. Uzkent.

2. Women's red and white silk trousers; braided at the bottom and round the waist. Osh.

3. Women's white trousers. Pieces of embroidery are sewn on to the ends. See next illustration. Kashgar.

4. A pair of richly embroidered ends for women's trousers which are always sewn on to new trousers. Yarkand.

Plate V.

1. Woman's coat of striped cloth. Lining of crimson calico. Worn under the khalatti. Kurshak.

2. Woman's khalatti of silk. Dyed by the *ikatten* process. Osh.

3. White trousers worn by poor women. Kurshak.

Plate VI.

1. Woman's long cloak of red cloth, ornamented with bright ribbons and black froggings. Osh.

2. Same cloak, back. The sleeves are merely for show and hang loosely at the back.

3. Woman's richly embroidered old dress. On the right of the collar an embroidered edge, as on Mongol cloaks, on the left 4 rows of ball-shaped silver buttons, in each of which there is a coral bead. Khotan.

Plate VII.

1. Young woman's cloak of red, flowery silk, lining of green silk. Turfan.

2. Woman's coat of red cloth; decorative strips sewn on to the breast. Hami.

3. Vest of red silk, edged with black leather, 4 mother-of-pearl buttons. Turfan.

4. Wide, embroidered trousers of yellowish chamois leather. Kashgar.

Plate VIII.

1. Cover (*kurak köpä*) of different coloured triangular pieces. This is used for covering bedclothes and pillows put away in a corner during the day. Turfan.

2. Part of a black, embroidered apron. Turkestan.

3. Black veil made of horsehair, with which women cover their faces. Only the wives of rich men use veils; the use of the veil is rarer in Eastern than in Western Turkestan. See MANNERHEIM, Records, p. 79, and pp. 43—44.

4. Towel decorated with embroidery and netting. Turfan.

5. Embroidered and frilled border of a white handkerchief. Uzkent.

Plate IX.

1. Woman's old coat, richly embroidered. Yarkand.

2. Embroidered belt with large copper buckles. Only rich people wore such belts. Kurshak.

Plate X.

1. White calico shirt, on which small black crosses are printed (see Plate XII). Such khalatti form part of men's dress throughout the whole of Eastern Turkestan, and they are worn either under another khalatti or as an outer coat. Kashgar.

2. Bluish-grey overcoat, blue lining. Hami.

3. Blouse-shaped shirt of dark blue cotton. Hami.

4. Trousers of the same cloth as the last. White cloth round the waist. Hami.

Plate XI.

1. Dark khalatti, light reddish lining. Men wore these over white underclothing. Osh.

2. Light yellow coat similar to a khalatti (*malla tsapan*), blue lining. Very typical of the inhabitants of Khotan both in colour and cut. Khotan.

3. Boot-last (*kälip*). Kashgar.
4. A pair of white felt heel-less stockings; worn in winter both in town and country, especially in the hills. Karghalyk.
5. Top-boots with iron heels; worn by the poor. Uzkent.

Plate XII.

Wooden blocks, with which coloured designs are printed on cloth. Kashgar.

Plate XIII.

1. Wooden case for scales (*torwae* or *xar*), including a bowl, a weight and 2 splint-trees. These are used throughout Central Asia. Kashgar.
2. Leather money pouch worn round the waist. Uzkent.
3. Linen money pouch (*tšandaza*) worn round the waist; embroidered at the bottom. Kashgar.
4. Iron jew's-harp. Yarkand.
5. *Tämbur*, musical instrument. Kashgar.

Plate XIV.

1. Tool for ginning cotton (*dukan*); the handle is $1\frac{1}{2}$ m long, the string (*zei*) is of sheep-gut. Below, a wooden club with which the string is shaken. Inside the club there is a leaden weight. Kashgar.
2. Apparatus for cleaning cotton by pressing it between rollers. Uzkent.
3. Spinning-wheel. Uzkent.
4. Iron-toothed, short-handled comb (*fargak*) used in weaving carpets. Khotan.
5. Loom for weaving ribbon with comb and reed. The teeth of the reed are forked at the bottom and correspond to the heddles of cloth-weaving looms. Osh.

Plate XV.

1. Oil-can made of all kinds of remnants left over from dressing and scraping leather. Kashgar.
2. Barber's pot (*önruk*) of baked clay. Kashgar.
3. Typical copper teapot. Uzkent.
4. Pouch of flayed goatskin, in which bread etc. is carried, slung over the shoulder. Uzkent.
5. Pipe with waterbowl made of kurbitsa, plentifully embellished with brass, ornamented mouthpiece of bamboo, pipe-bowl of clay with impressed ornamentation. Such pipes are only used by the wealthy. Ferghana.
6. Ornamented pipe-bowl and simple water container of a poor man's pipe of the usual kurbitsa. Pipes used by poor men circulate from mouth to mouth. Osh.
7. A couple of wads of tobacco made from the fruit of the cucumber plant. Osh.
8. Container made from the kurbitsa or kalebass fruit, in which tobacco etc. is kept. Beggars carry them on their wanderings. Kushlak.
9. Container for chewing tobacco. The shape is obtained by binding the fruit of the kalebass plant. Samarkand.

Plate XVI.

1. Cup (*hadša*) of baked clay; height 5 cm, diam. 10.5 cm. Khotan.
2. Bowl of baked clay; height 7 cm, diam. 17 cm. Khotan.
3. Clay vessel. Uzkent.
4. Clay pot ornamented in blue. Khotan.
5. Jade cup (*kashtash*). Khotan. Khotan is famous for its jade or nephrite industry. See MANNERHEIM, Records, pp. 92, 94.
6. Wooden pot-shaped vessel for holding fat. Uzkent.
7. Brass teapot and its tea-cosy. Osh.

Plate XVII.

1. Bird-shaped oil lamp of clay. Osh.
2. Oil lamp (*tširak*) of jade-stone. Khotan.
3. Tallow candle; in the middle a fatty plant-stalk, round which cotton is wound. Kashgar.
4. Oil lamp (*tšragh*) of glazed clay, home-made; in the middle a small piece of cotton. Kashgar.
5. Tongs of thin bent wood for lifting coal and tending a fire. Kashgar.
6. Iron fire-tongs. Kashgar.

Plate XVIII.

1. Ordinary bridle for a riding-horse with simple bit and short reins. Osh.
2. Short-handled riding whip; the lash is of plaited yarn, the handle of wood. Osh. Beautifully decorated whips occur sometimes, the handle being of dried sheep's bone and sheepskin.
3. Hemispherical covered case, in which food-cups are kept on a journey. The case is hung on to the saddle. Uz Kent. There are also cases made of hard leather or plaited of thin twigs, in which tea-cups are kept on a journey. Kashgar.
4. Common horseshoe with 3 nails. Osh.
5. Plaited straw basket. When filled with goods, they are slung on either side of a donkey's back. Turfan.
6. Currycomb of bound twigs. Kushlak.
7. Wooden stirrup used by the poor. Uz Kent.
8. Donkey or horse-collar decorated with triangular incisions. Osh.
9. Saddlebags of rough cotton cloth. They are fastened in such a way that the bags are suspended on either side of the saddle. Osh.

Plate XIX.

1. Model of a wooden pack-saddle (*tingultsak*) for donkeys, on which the wooden water-tubs in the next illustration are placed, hanging from the wooden yoke. Kashgar.
2. Model of a pair of wooden water tubs. The tubs, provided with tight lids, are slung from a pack-saddle on the back of a donkey.
3. Sickle. It differs from European sickles in regard to the manner of hafting, but closely resembles types known in China and developed there.
4. Model of a water-bucket used by women. The pole that rests on the bearer's shoulders is springy. The hooks, bucket handles and hoops are of wood. The buckets are ordinary wooden vessels composed of a number of staves. Kashgar.
5. Broad-bladed mattock (*ketmän*). Also used as a spade throughout Central Asia. Kashgar.
6. Model of a typical plough drawn by a pair of oxen. The plough is entirely of wood, only the tip of the part that ploughs the furrow in the earth being covered with iron. Kashgar. In its construction this plough is one of the most primitive and ancient types of plough in the world (see PAUL LESER, *Verbreitung und Entstehung des Pfluges*, pp. 364—, 532).

Plate XX.

1. Primitive sheep-shears (*shushang*).
2. Leather sheath worn in the belt and knife belonging to it. Uz Kent.
3. Dried fruit of some plant, with which pots are cleaned. Osh.
4. Ladle plaited of thin twigs, with which porridge (*palao*) is taken from the pot; slightly larger ones are used as skimming ladles and also as sieves, by means of which the grains are separated from the broth. Uz Kent. Such twig-ladles are of ancient descent in Central Asia; they were discovered already among the Turfan finds belonging to the VII—X century (A. von Coq, *Chotscho*, table 63 1).

5. »Plane» formed of two blades, with which suitable chips are stripped from a tree for making matches. Kashgar.
6. Axe-blade for chopping wood. Yarkand.
7. Rolling-pin used in making dough-like cakes. Osh.
8. Tailor's scissors (*katša*). Osh.
9. Adze or cross-bladed axe (*käke* or *tšoti*). Kashgar.
10. Bread-iron, with which holes are punched in baking bread. Osh.
11. Tailor's measure (*tjisa*), about 35 cm or $\frac{1}{2}$ arshin in length.

Plate XXI.

1. Surgeon's knife, with which swellings are lanced. Kashgar.
2. Double-bladed instrument for opening veins. Kashgar.
3. Horn-handled clasp-knife (*dšanoa-kush*). Guma.
4. Wooden-handled razor and sheath; carried in the belt. Uzkent.
5. Pincers, with which a barber extracts aching teeth. Kashgar.
6. Cupping »axe», with which incisions are made for blood-letting. Kashgar.
7. Leather sheath and bone pin for picking teeth. Uzkent.
8. Common Turkestan auger. Yarkand.
9. Iron-handled bladed tool (*bel*), with which hair is scraped from leather. Khotan.
10. Ear-spoon for cleaning the ears and pincers for plucking hair from the skin. Kashgar.

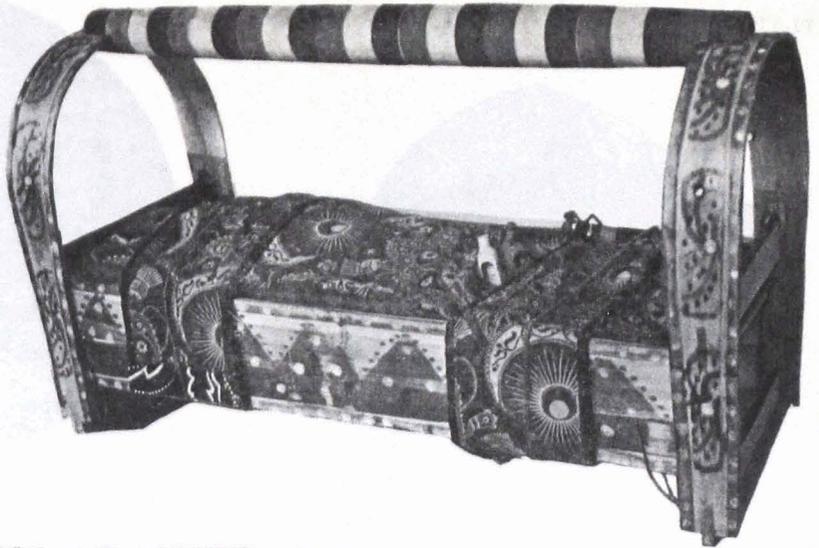
Plate XXII.

1. A begging dervish's garment. Kashgar.
2. A bowl scooped out of wood, carried by begging dervishes round their necks for collecting alms. Kashgar.
3. A horn (*sapaji*) with iron bells, a large iron ring and several smaller ones. This is jingled by begging dervishes to attract attention. Kashgar.
4. Three dervish staffs. Two with an iron ring. Kashgar.
5. A board with faint traces of writing. Such boards are used as alphabet books in schools. Kashgar.
6. A magician's book with magic formulae. On the left-hand page two oblong dice.

Plate XXIII.

1. Wooden comb with ornamental cuts on the top. Kashgar.
2. Leather comb-case. Kashgar. There are also round comb-cases, on which there is a great deal of ornamentation.
3. A small monkey of baked clay worn as a charm.
4. Four pieces of sheep's bone, used by the poor as playing dice. Yarkand.
5. A cloth-covered ball, decorated with eight triangles of different coloured thread. Yarkand.

PLATE I.



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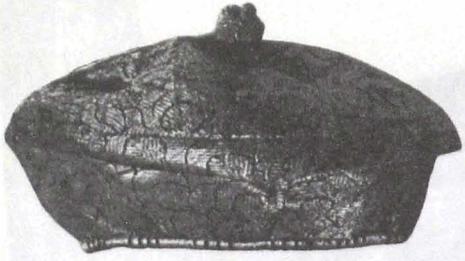


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PLATE II.



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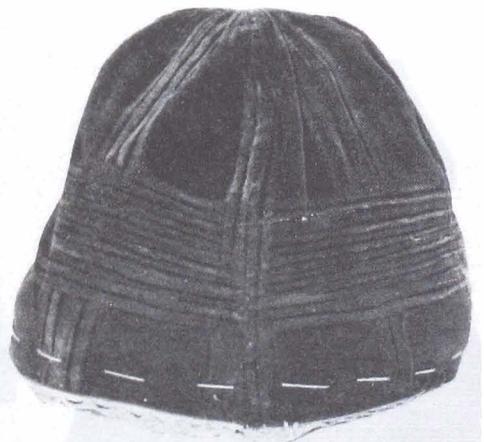
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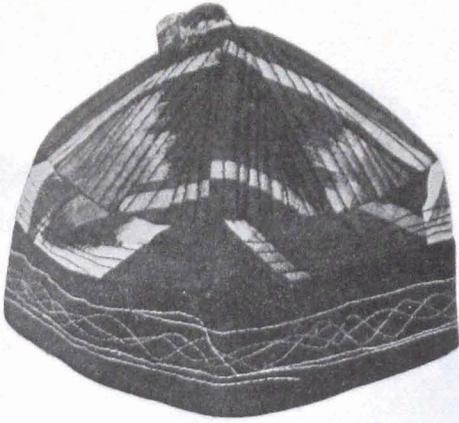
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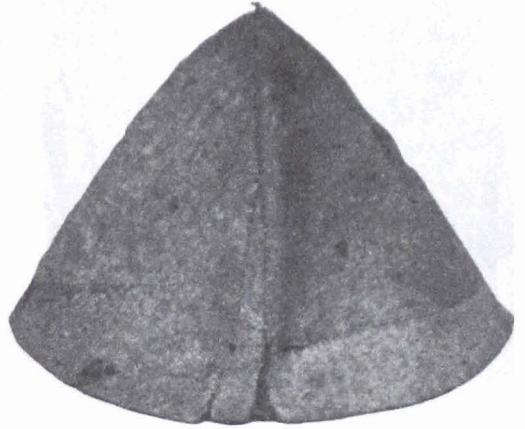
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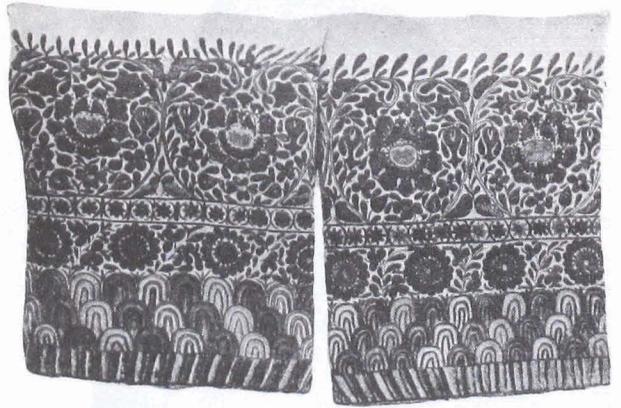
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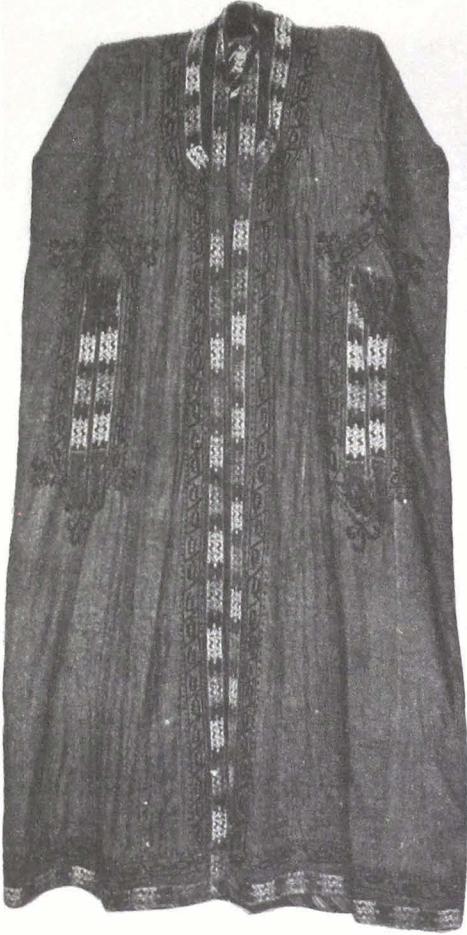


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PLATE VI.



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PLATE VII.



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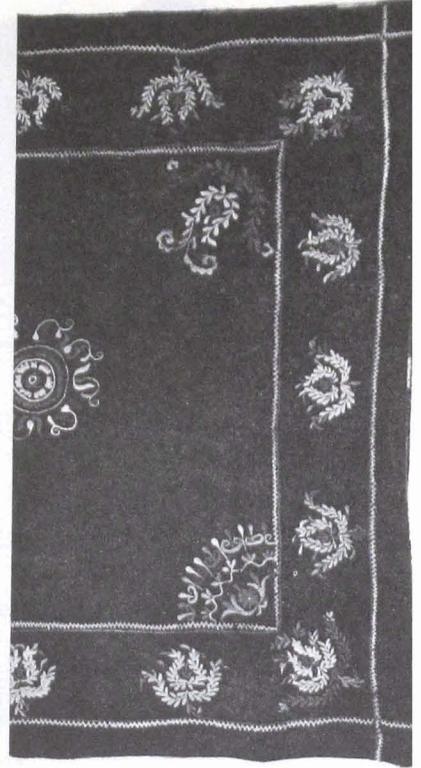


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PLATE VIII.



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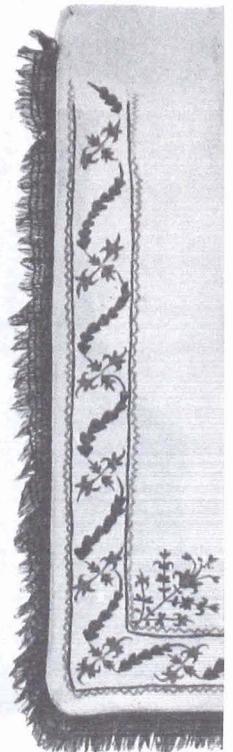
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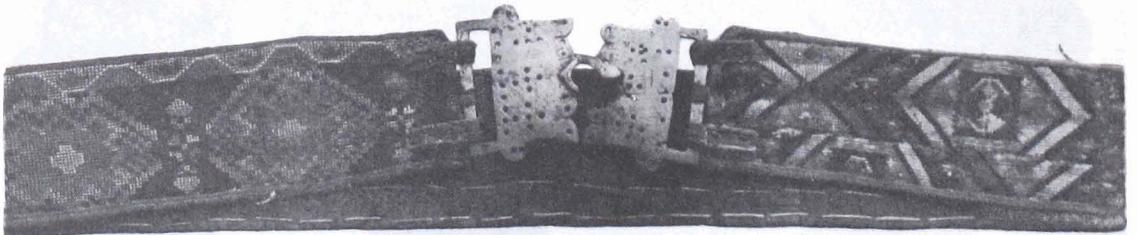
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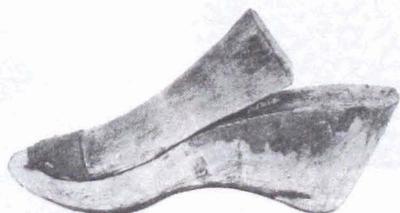
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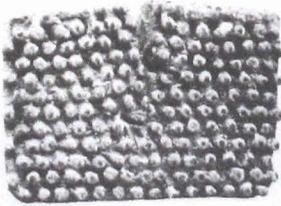
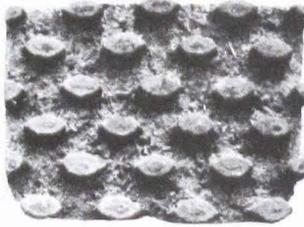
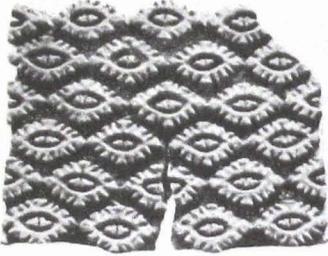
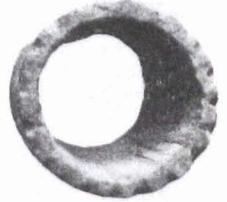
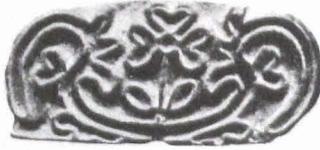
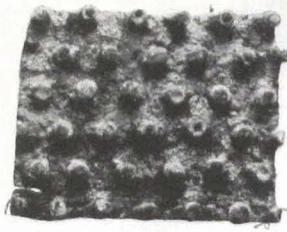


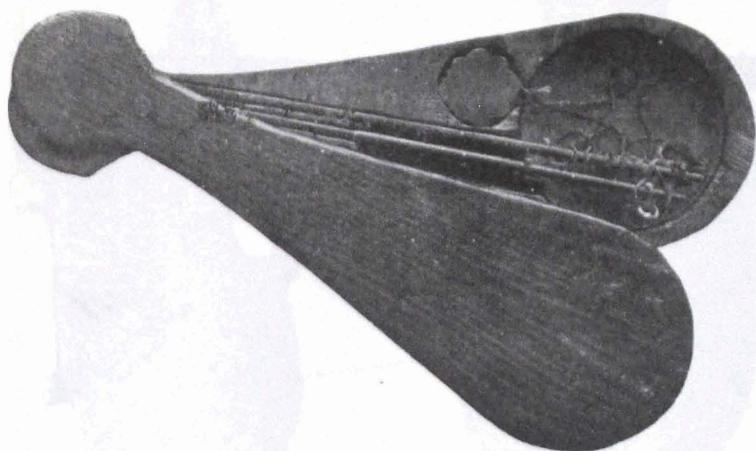
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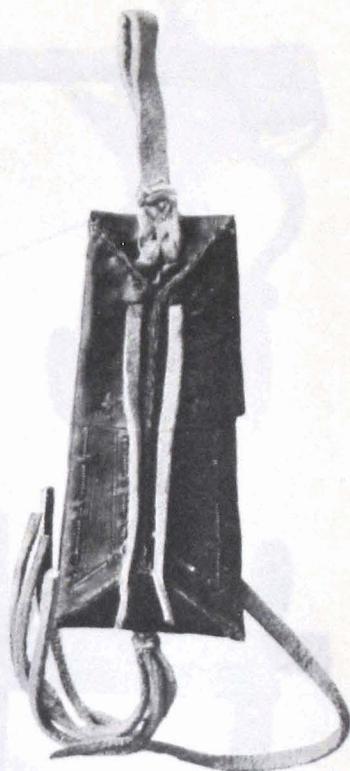
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PLATE XII.

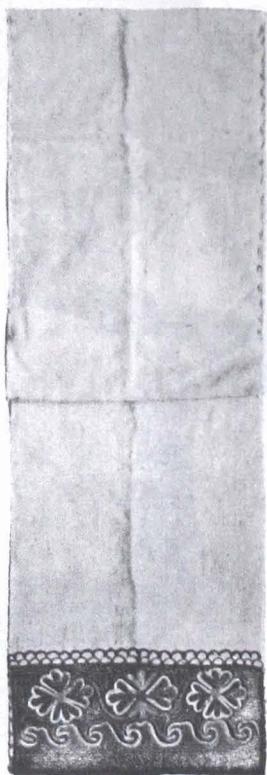




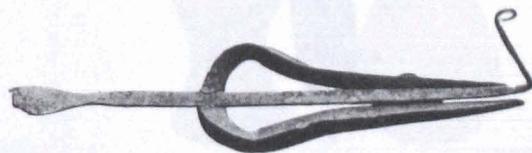
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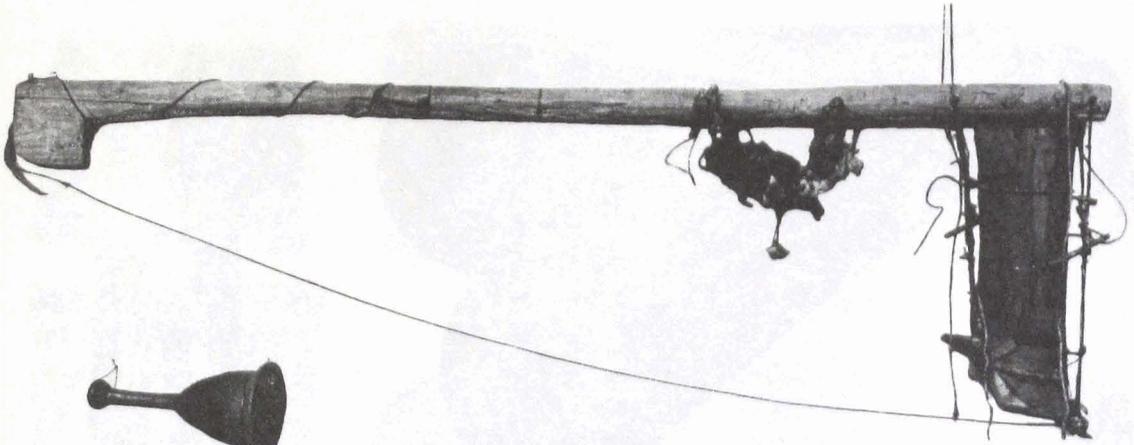


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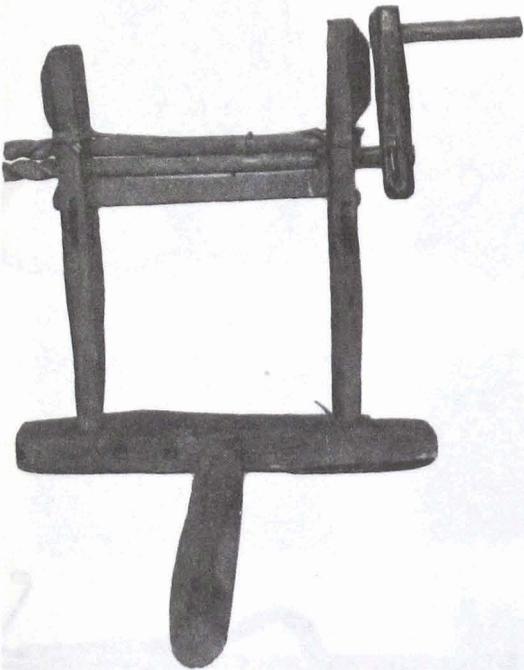


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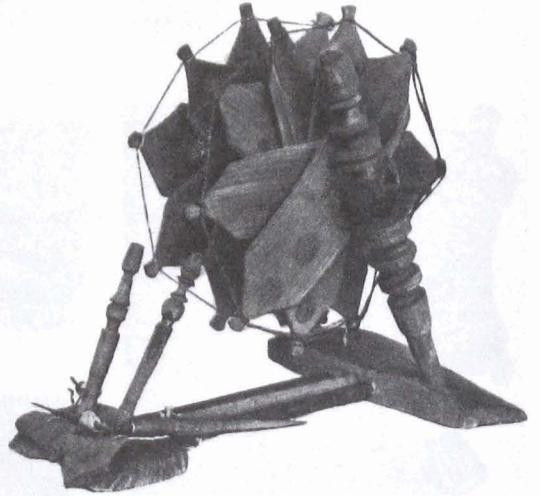
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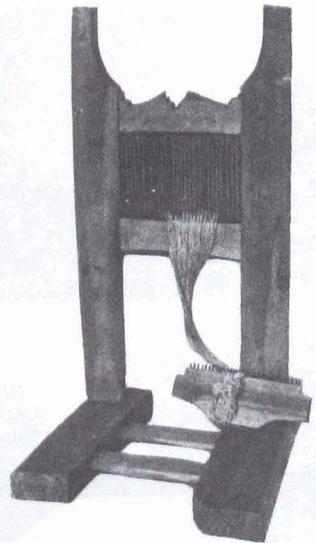
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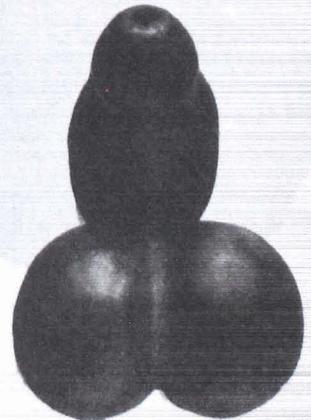
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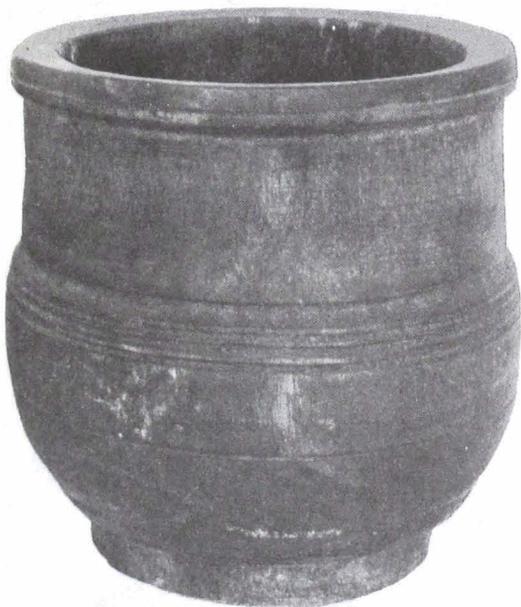
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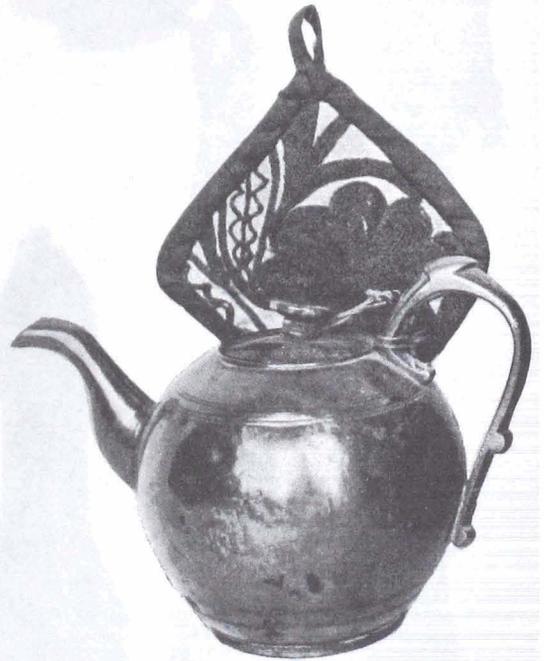
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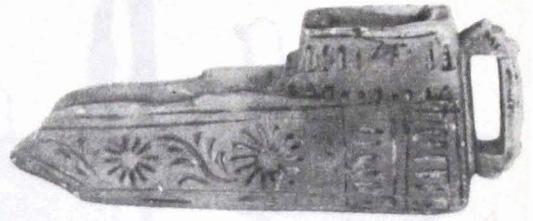


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PLATE XVII.



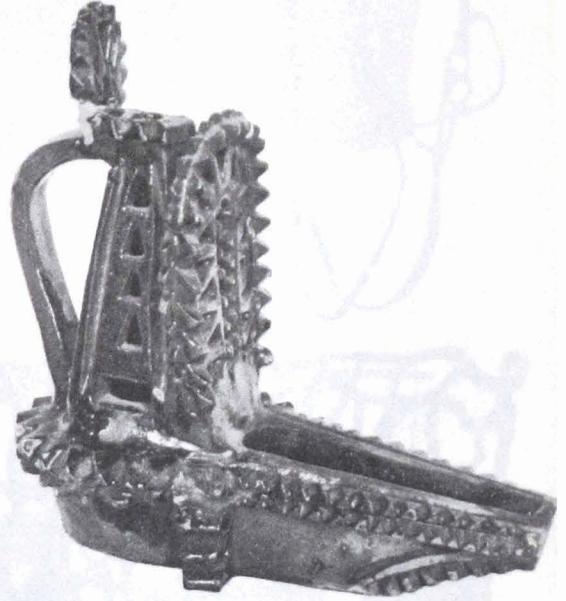
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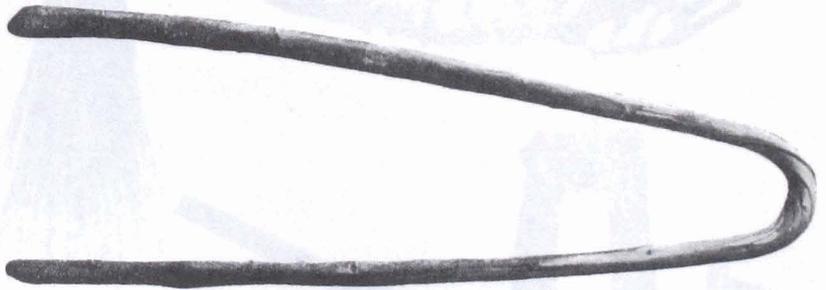
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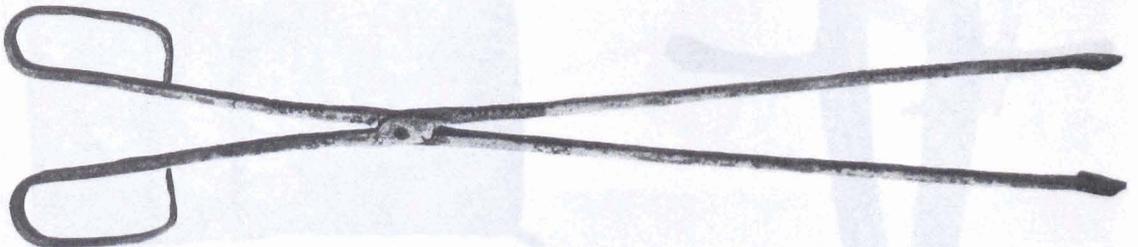
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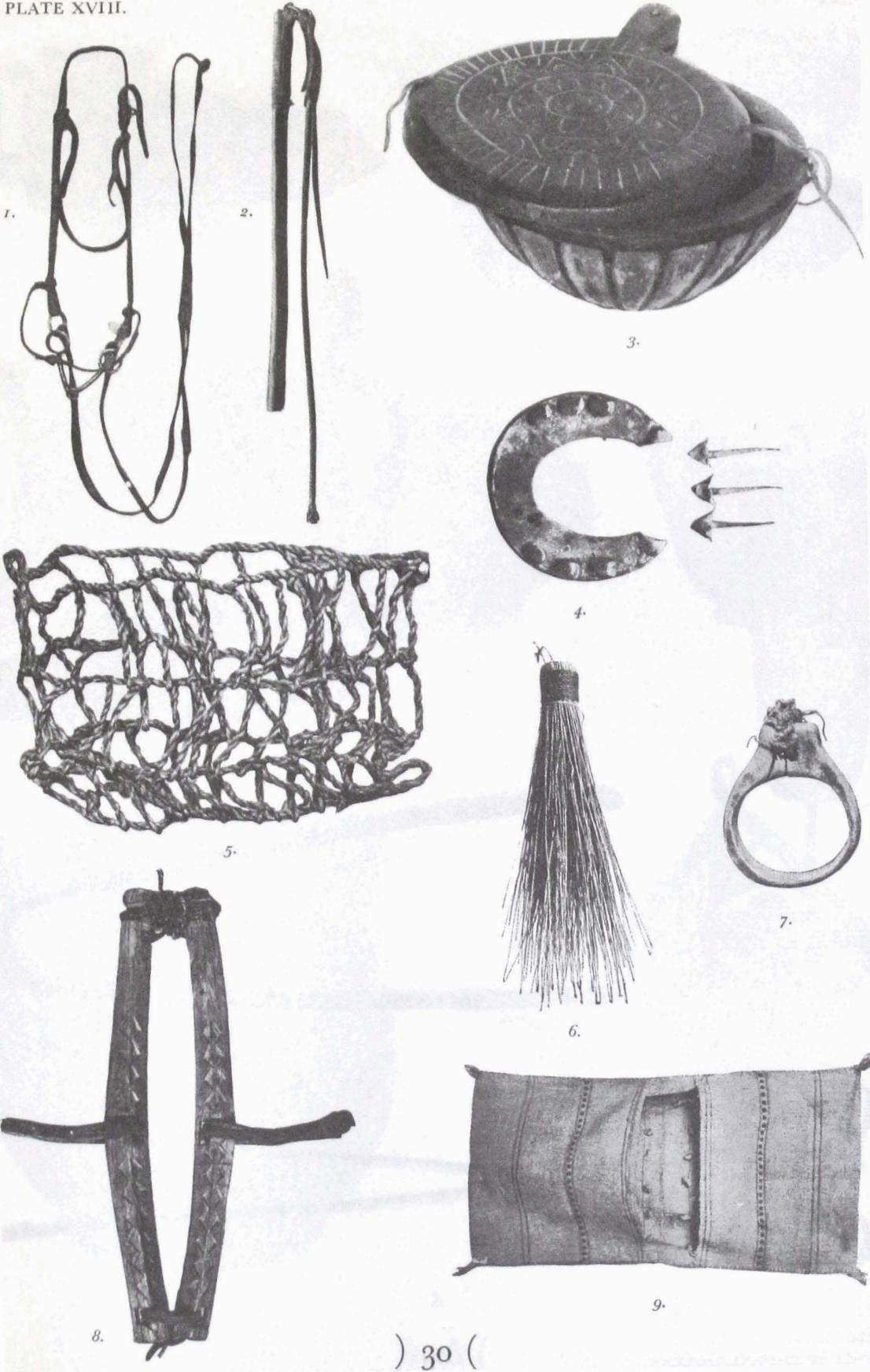


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PLATE XVIII.



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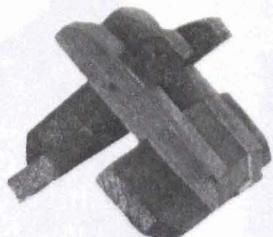
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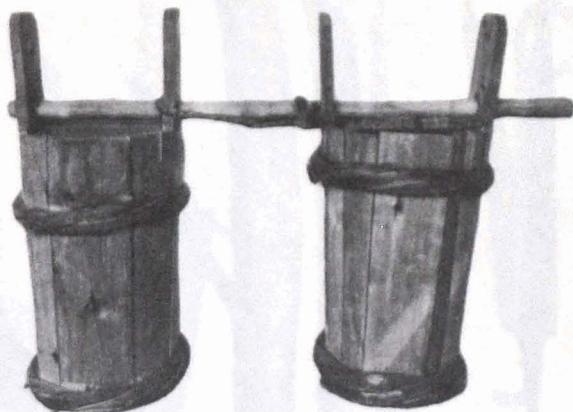
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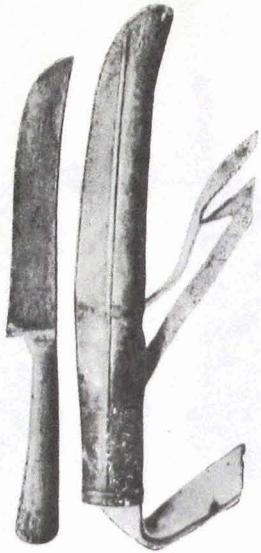


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PLATE XX.



1.



2.



3.



4.



5.



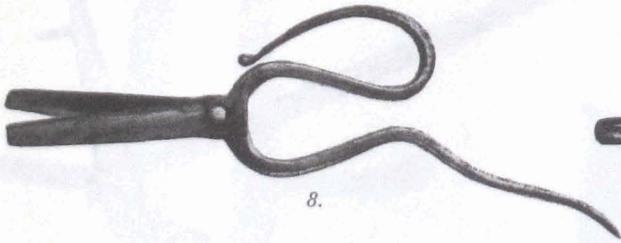
6.



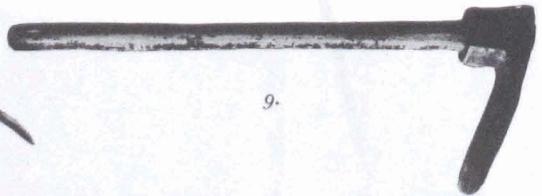
7.



10.



8.



9.



11.

PLATE XXI.



1.

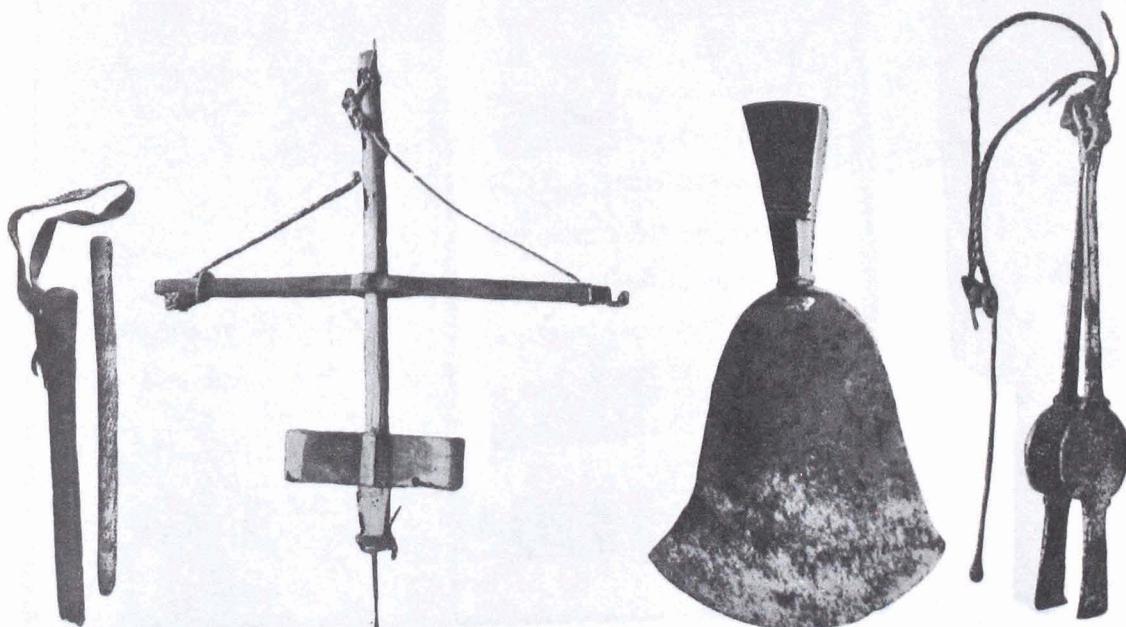
2.

3.

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6.



7.

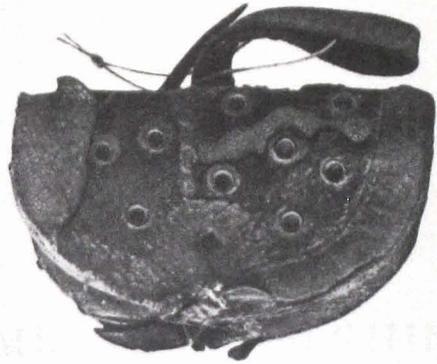
8.

9.

10.



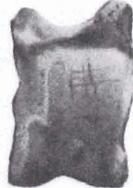
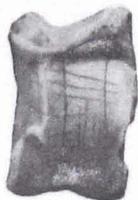
1.



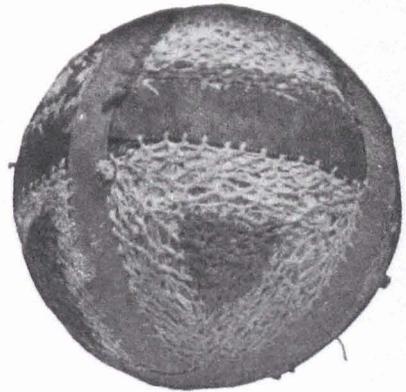
2.



3.



4.



5.

SOME BUDDHIST FRAGMENTS FROM CHINESE
TURKESTAN IN SANSKRIT AND
"KHOTANESE"

BY

J. N. REUTER

The fragments of which I propose to give an account in these pages¹ form part of a collection of objects of ethnographical and historical interest made at the request and under the direction of the late Senator OTTO DONNER, at the time President of the Finno-Ugrian Society, by my countryman Colonel (now Fieldmarshal) Baron GUSTAF MANNERHEIM, during an expedition which he undertook in 1906—1908 through Central Asia to Northern China. Baron MANNERHEIM went from Kashgar to Khotan, whence he returned to Kashgar, and then took a more northerly route over Qulja, Urumchi, Kucheng, Turfan, Barkul to the East.

Among the manuscript fragments which Baron MANNERHEIM sent to Helsingfors a few are written in Indian characters, most of these in Sanskrit (fragments 1—9), one appears to be bilingual (fragment 10), and one is in the 'Khotanese' language.

It is an unfortunate circumstance that the locality where these MANNERHEIM fragments, as I propose to call them, were found or acquired by purchase cannot be determined. The objects sent home by Baron MANNERHEIM were accompanied by notes giving the site of the find and other data, but when the present fragments were handed over to me for inspection, no such notes, with one exception, came into my hands. The necessary data might, however, have been easily supplied from Baron MANNERHEIM's notes, then in the possession of Senator DONNER, had not the unexpected death of this distinguished scholar and ardent promoter of Oriental, and especially Ural-Altai research, made the identification of the notes impossible.

I am not even quite certain to what fragment the exception mentioned above has reference; but to the best of my recollection, it is to fragment 6. It was found, together with one coin and three button-like ornaments, in the sand, from which the top-most layer had been blown away, at Hangi (in some maps called Yangi) six stations south of Khotan.

Fragments 1—3. These are all small pieces of irregular shape. No. 1 (Plate I) is written on thick and firm paper without waterlines. The script, as will be seen from the figure, is of about the same size as the Bower manuscript, and rather similar in character; it is very

¹ This investigation was published in *Journal de la Société Finno-Ougrienne* XXX: 37, 1913—18.

like the fragments of the Stein collection marked at the British Museum Kha II; it is probably the oldest of the fragments here dealt with. It is impossible to make out a cohesive sense of the few words that can be deciphered in this small fragment, nor is it possible to determine which side is obverse. I mark the two sides (A) and (B): —

- (A) 1. 1 *śedi*
 2 . . . *ti* || *nayanān* . . .
 3 . . . *sya vacanaṃ karmavi*[*pāka* (?)]. . .
 4 . . . *ta yogaṃ patnī sajnā*
 (B) 1 . . . *tyajad = eva vikārakāra* . . .
 2 . . . *smā tyakto si naivam = u* . . .
 3 . . . *rocāmi tathā śa* . . .
 4 *ṃ la pannā* . . .

No. 2 (not figured) is very irregular in shape; the greatest length is 3 in. and width $3\frac{1}{4}$ in.; fairly thick, brownish paper, rather even in texture, with longitudinal waterlines, about 15 to an inch; right-hand margin preserved. Rather bold characters, but script in places much worn out.

- (A) 1. 1 (illegible)
 2 . . . *karāṇām vivikta* (?)¹ . . .
 3 . . . *teṣāṃ yā caryā ano* . . .
 4 . . . *namatinām acala* . . .
 5 . . . *ma samamunināṃ* . . .
 6 . . . *la*
 (B) 1 . . . *ca*
 2 . . . *nāṃ gocarā xo xā* . . .
 3 . . . [*da*]*śadiśi lokena ya* . . .
 4 . . . *ndriyajñānagatānā* . . .
 5 . . . *idyeta manasā xz* . . .
 6 *daśadiśi ma* . . .

No. 3 (not figured) is rhomboid in shape, lower edge of obverse intact, $4\frac{3}{4}$ in. long; opposite edge, torn along the middle of a line on both sides, 3 in.; width $3\frac{1}{4}$ in. Paper light brown with waterlines across the leaf, 11 to an inch. Script rather large, well preserved, of a somewhat slanting Gupta type. On the reverse the three first lines stand closer, then there is a broader space, and lines 4—7 follow at more irregular intervals; on obverse the intervals between the lines are broader, so that it holds six lines only.

The fragment represents a discourse between the Buddha(?) and Kāśyapa on the four classes (see rev. l. 5) of *duḥśīlaśīlavatpratirūpakāḥ*.

¹ Here, and in the sequel, indistinct characters are printed in italics; in unreadable or completely deleted akṣaras the consonants are rendered by x, and the vowels by z; conjectured readings are marked with square brackets, and characters that have been erroneously left out in the manuscripts are put in round brackets.

- Obv. l 1 || tadya[thā kā]śyapa glānapu[ru]ṣo¹ ra
 2 [a]lamkaronti || tadyathā kāśyapa maṇ[i] . . .
 3 xyanu || tadyathā kāśyapa mṛtasya mālā . . .
 4 vastraprāvṛtasya pravaraandanānuliptasya śre . . .
 5 kāśyapa duśilā(!)śilavapratirūpakāḥ kata[me catvārah(?)] . . .
 6 . . . treṣv = api vadyeṣu bhayadarśi² samādāya śikṣa . . .
 Rev. 1 . . . [bhavati : a]yaṃ kāśyapa prathamo duśilāśilavapratirūpakāḥ || . . .
 2 . . . [skha(?)]litaṃ bhavati : ayaṃ kāśyapa dvitiyo duśilāśila[vapratirūpa-
 kaḥ ||] . . .
 3 . . . jātiṃ ca sarvvasaṃskārānāṃ śrutvā : utrasati saṃ[t]r[asati] . . .
 4 [dv]ādaśa dhuttaguṇān = samāya³ varttate . . .
 5 . . . [ime khalu kāśyapa(?)ca]tvāro duśilāśilavapratirūpakā . . .
 6 na nāmarūpam na nimittaṃ : na śamo . . .
 7 [du]śīle

The consonants of the first akṣara rev. l. 4 are missing, but the vowel in unmistakably *ā*. The dhūtaguṇas, according to Dharmasaṃgraha 63 and Mahāvvyutpatti 49 (Mironoff's edition) number 12, while the Pāli literature knows 13 dhūtaṅgas.

Fragment 4. (Plate II). A complete leaf 9³/₄ by 3 in.; string-hole 2³/₈ in. from left-hand margin. Pale yellowish paper, brittle, much soiled, uneven texture, with much thicker patches; narrow, transversal, rather indistinct waterlines. Script rather similar to that of fragment 1, but smaller; 9 lines. Trace of number on the left-hand margin of obverse.

The writing is so badly damaged that it is impossible to give anything approaching a complete transcript of it. On obv., l. 1, at a distance of some three (deleted) akṣaras from the left-hand margin, there is a faint trace of the figure 7; the last character is the figure 8; towards the ends of lines 3 and 4 are the figures 10 and 11 (of which latter, however, only the 10 is visible); on the last line we have, at a few akṣaras' distance from the beginning, the figure 15, and on the reverse, l. 1, after 6 akṣaras, the number 16. As will be seen from the plate, a section ends here.

This points to the conclusion that the text on obv. is metrical; it contains verses 8—16, which gives an average of one line to each stanza. Each line holds some 45—50 akṣaras, and when allowance is made for the figures and for the string-hole, one expects the metre to belong to the triṣṭubh-jagatī type. This conclusion is fully borne out by the connected words that can be deciphered on lines 1 to 4, where the metre is obviously a mixture of indravajrā (or upendravajrā) and indravamśā (or vaṃśasthā).

The new section beginning on the reverse, l. 1, is evidently prose; on the latter half of line 6 a new paragraph begins which is probably metrical. On line 7, immediately

¹ Or: *puriṣo*; there is no trace of a *u*, and the sign for *i* would be on the part torn away.

² *da* is added below the line.

³ Between *mā* and *ya* one akṣara has been erased, as it appears, intentionally; read: *samādāya*(?), but there is not sufficient space for the akṣara *dā*.

below the sign denoting the end of a paragraph, is a slightly curved horizontal stroke, which may be a mark of punctuation, but more probably stands for the figure 1, and on line 8, a little more to the left, there are two similar strokes, denoting, probably, 2. This, again, leaves about one line to each stanza, and the few consecutive words that I have been able to decipher point to the conclusion that the metre is the same here as in the preceding section.

The latter part of the fragment deals with Bodhisattvas, adorned with the four dharmas. A reference to the four dharmas is found in Mahāvastu II, p. 356 sq., but this passage, unfortunately, is mutilated. From what can be made out of the fragment, the parallelism is not very close. (cf. also Childers, p. 119 col. 1 s. v. *dharmo*).

Below follows an attempt at a metrical reconstruction of stanzas 8 to 11; the akṣaras that I have been unable to read — and they are in the majority — are represented by the signs for long and short syllables respectively, as the metre may require.

Obv. (l. 1) — ॐ — 7
 ॐ — ॐ — — ॐ ॐ — ॐ — rājñā
 ॐ — ॐ — — ॐ ॐ — ॐ — diśe
 ॐ — pa — — ॐ ॐ dha ॐ — ॐ (—)
 deśeṣam = eṣanta caranti dharma[m] 8
 (l. 2) ॐ — ॐ — — ॐ ॐ — ॐ — ॐ (—)
 ॐ — ॐ — — ॐ ॐ re na bhoti
 satvāna so hy = āśaya sarvi jānati
 ॐ — ॐ na¹ śikṣitu dīrgarātram 9
 dharme (l. 3) ॐ — — ॐ ॐ — ॐ — ॐ (—)
 ॐ — ॐ — — ॐ ॐ — ॐ — ॐ (—)
 jāna[m]ti satvāna ca sarvi āśaya
 tathaiṣa dharmehi² ॐ — ॐ yanti 10
 jāna[m]ti (l. 4) — — ॐ ॐ — ॐ — ॐ (—)
 ॐ — ॐ — — ॐ ॐ bhonti kovida:
 dharmam ॐ — — ॐ ॐ — ॐ āśrita
 dharma[m] ta — — ॐ ॐ — ॐ kālam 11

In the following lines I can read only a few isolated akṣaras.

The new section, Rev. l. 1, begins: [caturbhiḥ] dharmebbhiḥ sa[manvāgato]³ bodhisatvo bodhisatvacārikāṃ carantaḥ(?) satva⁴ x z x z x z (l. 2) jñānaviśeṣapāramitā r[bh]i iti kena vīryeṇa (l. 3) anikṣiptadhurā a pari samantajñāna . . va . . (l. 4) d = vīryasama[nvāgato] bhavati ti yukto bha[vati] na ca kiṃci (l. 5) jya anyatra anuttarā[yāḥ] samyak-

¹ na to be read long; in Buddhist Sanskrit a short final frequently has the value of metrical length. This happens in the indravajrā type most often in the fifth syllable, immediately before the two shorts; next in frequency this is the case in the fourth syllable.

² Or: dharme hi.

³ The akṣaras in brackets supplemented from line 5.

⁴ Or: sa[r]eva; cf. l. 6.

saṃbodheḥ(?)] caturbhiḥ dharmebhiḥ samanvāgato bodhi[sa]tvo bodhisatvacā (l. 6)
|ri]k[āṃ carantaḥ sa]rvvagunaḍharmaviśeṣā

Now follows the new metrical portion:

anantavīryyeṇa ◡ — ◡ — *ddha* xo
na saḥ kadāci (l. 7) ◡ ◡ — ◡ — xe
◡ — ◡ buddhāna guṇā ◡ — —
◡ — ◡ thā ārabhate sa — ◡ (—) 1
yatha kṣetra śodhenti ti lokanātha
yathā ca satvāṃ (l. 8) pari[mocaya]nti
◡ — ◡ — — ◡ ◡ — ◡ — —
[ahaṃ pi?]satvāṃ pari[moca]yiṣye 2
jñānena saṃbhōti ◡ taṃ niruktiṣu(?)
nidhāna tasya¹ bhava² (l. 9) — ◡ — —

Fragment 5. (Not figured). Length about 8¹/₈ in.; breadth 3¹/₈ in.; about one third of the right-hand side torn away; string-hole 3¹/₈ in. from left-hand edge. Paper light yellow, thin, even texture, longitudinal waterlines. Script very good, but so worn as to make it almost illegible, especially on obverse. Six lines on each page.

This is a fragment from the *Saddharmapuṇḍarīka*, printed text p. 40¹⁶ to 41¹⁴, beginning thus: dikṣv = aprameyāsv = asaṃkhyeyāsu lokadhātuṣu etc., and ending: viditvā dharmam de[śaiyiṣyanti]. The reading of the fragment, as far as it is possible to decipher it, appears to differ but slightly from the edition. In the fragment lokadhātu is fem.; for Śāriputra the fragment has Śāradvatīpura, for samādāpanam : samādapanam, for nānādhātvo : anekadhātvo; saddharmaḥ is written sadharmaḥ; in the phrase sattvānāṃ dharmam deśitavantaḥ the fragment leaves out dharmam.

Fragment 6. (Plates III and IV). Length 7⁵/₈ in.; breadth 3 in. Right-hand margin intact, and lower edge (of obverse); upper edge badly ragged, and a long piece torn off from left-hand side. Longest lines contain 28—31 akṣaras, and some 18 or 19 akṣaras are missing, which would make the length of the leaf to be about 12 or 13 in. String-hole about 5¹/₂ in. from right-hand edge, which would make it at about the middle of the whole leaf, and, if anything, more to the right.

The fragment contains a portion of the *Suvarṇaprabhāsa*, parivarta 14, and corresponds to p. 68⁹ sqq. of the text published by Rai Śarat Chandra Śāstri in *Buddhist Texts*, published by the Buddhist Texts Society of India (Calcutta, 1898). The stanzas are numbered in the fragment 27—32. I print below the fragment, supplemented from the edition; the words missing in the fragment are put in square brackets and besides, for the sake of greater clearness, in italics. I must, however, make the reservation that it is by no means certain that the words thus supplemented represent the actual reading of the fragment, which, as will be seen, differs considerably from the edition.

¹ Final vowel has metrical length; cf. note¹ p. 6.

² Or: ca va-

Line 1 of obv. is illegible.

(1. 2) [*prakāśitaṃ sūtram idaṃ*] tadamtareṇa¹ 27
 [yan me] śrutam sūtram idaṃ tadamtareṇa²
 ekā (l. 3) [*gravācām anumoditaṃ ca*
tenaiva mahyaṃ kuśalena karmmaṇā]
 — — — — xe anumodaneṇa(!) ca³ 28
 suvarṇavarṇa śatapuṇyalakṣaṇo
 bhomi (l. 4) — — — — — (—)
 — — — — — ntadarśano
 ratim̄ karo devasahasrakoṭinām⁴ 29
 navānavatikoṭīśatasa (l. 5) [hasraṃ]⁵
[kalyāṇa bhūvaṃ nṛpacakravarttī
anekakalpaśata]sahasraṃ⁶
 yat = koṭarājatva⁷ mayānubhūtam 30
 acintikaṃ kalpaṃ = abhūṣi⁸ śakras =
 ta (l. 6) [*thaiva brahmendrapraśāntamānasāḥ*
ārāgitā me daśabalāpra]meya⁹
 yeṣāṃ pramāṇaṃ na kadāci vidyate 31
 tāvāpramāṇo bahupuṇyaska (Rev. l. 1) [*ndho¹⁰*
yan me śrutam vānumoditaṃ ca yathā
yathābhiprāyemi bodhi prāptā]
 sa dhama (!) kāyaś = ca mayā hi labdha¹¹ 32

svarṇabhā¹² sottamasūtreṇdrarājā¹³ asaṃbhavapari¹³ (l. 2) [*vartto nāma caturdaśaḥ || yaḥ*]
 kaści¹⁴ śrīmahādeva te śraddhakulaputro¹⁴ vā kuladuhitā vā atītānāgatā(!)pratyutpa (l. 3)
[Jnnānām buddhānām bhagavatām acintyām] mahatī¹⁵ vipulā¹⁵ vistīrṇām sarvopakaraṇai pūjām
 kartukāmena¹⁶: atītānā (l. 4) [*gatapratyutpannānām buddhānām bhagavatām gambhīraṃ buddha*]
 gocaraṃ prajānitukāmo¹⁷ bhavet tenāvaśyaṃ tatra pradeśe : vihāre vā : (l. 5) [*araṇyapra-*
deśe vā yathāyaṃ suvarṇaprabhāsottamaḥ sūtreṇdrarājāḥ prakā]śyate¹⁸ tenāvyaḥkṣiptacittenāvahi-
taśrotreṇāyaṃ¹⁹ su (l. 6) [varṇaprabhāsottamaḥ sūtreṇdrarājāḥ śrotavyaḥ ||].

¹ Edition: *tadantare*. ² Ed.: *tadā purā*; the fragment has one supernumerary syllable. ³ This pāda runs in the edition as follows: *śrotānumodena śrutena tena*, which cannot be used for the restoration of the reading of the fragment. ⁴ The reading of the edition is based on a different construction of the sentence:

suvarṇavarṇaṃ śatapuṇyalakṣaṇaṃ
l a b h a y i kāyaṃ priyadarśanaṃ sadā
nayanāyirāmaṃ (!) janakāntadarśanaṃ
ratīṅkaraṃ devasahasrakoṭinām ||

⁵ Ed.: *na cāntaraṃ navatisahasrakotyō*. The reading of the fragment gives a faulty metre; regarding the cadence, cf., however, Mahāvastu I, 43, l. 14. The metre in the ed. is unimpeachable, with two shorts for a long syllable after cæsura, but the reading cannot be correct. I suggest: *navottaraṃ*. ⁶ Ed.: *śahasrān*; metre defective. ⁷ Ed.: *koṭya*. ⁸ Ed.: *acintiyā kalpa babhūva*. ⁹ Ed.: *°meyā*; metre incorrect, unless we read *mē*, or *mi*. ¹⁰ Ed.: *tathā pramāṇaṃ bahupuṇyaskandham*; for *yan* etc. the fragment probably had *yo, śruto °moditaś*: the reading in the edition is corrupt; I suggest to leave out one *yathā* and read:

yan me śrutam ca anumoditaṃ ca
yathābhiprāyēṇa mi bodhi prāptā

The whole of line 6 is illegible.

Calculated on the basis of the metrical portion on the obverse, the lines on the reverse would give room for many more akṣaras than those supplemented from the edition: line 2 might hold 11 more akṣaras, line 3, 5 etc. The surplus space may, however, be accounted for by the circle, extending over several lines, which frequently is drawn on this kind of manuscripts at the end of a parivarta.

Fragment 7. (Plate V). A complete leaf; edges in many places damaged; 22 in. by 9 1/4 in.; string-hole 5 1/2 in. from left-hand edge. Paper light brown, thin, very even texture, narrow, regular longitudinal waterlines. Script bold and beautiful, but the ink is in many places worn off. Fourteen lines to the page. No number visible.

The fragment is on the whole identical with a passage in the published text of the *Śatasāhasrikā Prajñāpāramitā*, 11th parivarta (pp. 1560 l. 4 to 1563, l. 7), but it shows several deviations from this text which will be marked in notes; mere scribe's, or printer's, errors are not noted. What is more important, the text in the fragment is distributed over two parivartas, of which the former, here numbered 20, ends obverse, l. 7. It is styled *abhibhavanaparivartta*, a name which is derived from the expression »*mahāyānaṃ sadevamānuṣāsuraṃ lokam abhibhūya niryāti*», which is not met with in the fragment, but is repeated many times in the earlier portion of parivarta 11 in the *Śatasāh.* Pr.

The fragment reads as follows: *)

Obverse.

1. syārhata: samyaksambuddhasya ṣaṣṭyāṅgopeta: tsvaro¹ hy = abhāvo¹ na bhāvas = tasmā tathāgato rhaṃ samyaksambuddha: ṣaṣṭyāṅgopetena² svareṇa² daśasu dikṣv³ = asaṃkhyān = aprameyā[ṃl³ loka-]
2. dhātūn = svareṇa vijñāpayati:⁴ sacet = subhūte tathāgata: - syārhata samyaksambuddhasya dharmacakraṃ bhāvo⁵ py = abhaviṣyat na tv = abhāvo⁵ nedam tathāgato rha samyaksam[buddho]
3. dharmacakra pravarttayiṣyat⁶ apravarttitam⁷ śramaṇena vā brāhmaṇena vā yāvat⁸ = kena cid = vā puna: loke na² saha dharmeṇa: yasyāt(!) = tarhi subhūte tathāgatasya⁹ dharmacakraṃ = abhāvaṃ¹⁰ na bhāvaṃ¹¹ tasmā tathāgatena¹² dharmacakraṃ pravartti-

ca is metrically long. Dr. HOERNLE informs me that the Cambridge MS. Add. 875 reads: *cānumoditaṃ*, which confirms my conjecture. Cambridge MS. Add. 1342 has: *cābhyānumoditaṃ*, which Dr. HOERNLE thinks is the correct reading. A *Suvarṇaprabhāsa* fragment, marked No. 143 SA. 16 appears (p. 113 sqq.) in the forthcoming publication of Buddhist fragments prepared by Dr. HOERNLE. The reading is there:

*yan me śrutaṃ sūtrānumoditaṃ ca
yathābhiprāyeṇa mi bodhi prāptaṃ.*

¹¹ Ed. and the HOERNLE fragment: *sadharmakāyaṃ, labdham.* ¹² Ed.: *iti suvarṇaprabhā°.* ¹³ Ed.: *°rājasuṣaṃ°.* ¹⁴ Ed.: *kaś cic chrīmahādevī tena sārddham kula°.* ¹⁵ Ed.: *°līm °lām.* ¹⁶ Ed.: *karṭtukāmaḥ syāt;* the reading in the fragment, unless corrupt, suggests some other construction of this sentence. ¹⁷ Ed.: *parijñātu°.* ¹⁸ Ed.: *°kāśati.* ¹⁹ The akṣaras *nāvyā* indistinct; Ed.: *nāvīkṣiptacittēnāvīrahitaśro° (om. te).*

*) In this and the following fragments I do not transcribe the visarga, but render it with a colon; the visarga is used so irregularly, that it is impossible to know every time where it is actually meant, and where this sign stands for a mark of punctuation.

tam = apravarttitaṃ¹² śramaṇena vā brāhmaṇena vā yāvat¹³ = kena cid = vā puna: loke saha dharmeṇa sacet = subhū-

5. te satvāni¹⁴ bhāvāny = abhaviṣyat na tv = abhāvo¹⁴ yeṣāṃ kṛtena¹⁵ tathāgatena¹⁶ dharmacakraṃ pravarttitaṃ na¹⁷ hi tāni satvāny = anutpādaśeṣe nirvāṇadhātāv = aparinirvāpayiṣyat¹⁷
6. yasmāt = tarhi subhūte tāni² satvāny¹⁸ = abhāvāni na bhāvāni¹⁸ yeṣāṃ kṛtena¹⁵ tathāgatena¹⁶ dharmacakraṃ pravarttitaṃ = tasmāt = tāni² satvāny¹⁹ = anutpādaśeṣe¹⁹ nirvāṇadhāto parini-
7. vṛtāni²⁰ ca parinirvānti ca parinirvāsyanti²¹ ceti²¹ || abhibhavanaparivartto²² nāmna viṃśatimaṃ samāpta 20 || ayaṃ deyadharmadānapatijñāya buddhā-hakāya²² ○
8. ya:²³ puna: subhūte r-evam = ākāśasamaṃ tad yāna:m²³ = evam = eva tsubhūte evam = etat = subhūte² na² ākāśasamaṃ tad = yāna yathākāśasya²⁴ na pūrvva:
9. dik = prajñāyate na dakṣiṇā na paścimā: nottarā dik² = prajñāyate² nordhva dik² na²⁵ heṣṭimā²⁵ dik²⁵ nānuvidiśa: prajñāyate evam = eva subhūte tathāgatayānasya²⁶
10. nāpi²⁷ pūrvasyā²⁷ dik = prajñāyate na dakṣiṇā na paścimā nottarā dik²⁸ = prajñāyate² nordhvā dik na heṣṭimā dik²⁹ nānuvidiśaḥ = prajñāyate²⁹ tadyathā³⁰ subhūte ākāśaṃ nāpi
11. dīrghaṃ nāpi hrasvaṃ nāpi vṛttaṃ nāpi parimaṇḍalaṃ = evaṃ subhūte tathāgatayānaṃ nāpi dīrghaṃ nāpi hrasvaṃ nāpi vṛttaṃ nāpi parimaṇḍalaṃ³⁰ tadyathā³¹ subhūte ākāśaṃ
12. na nilaṃ na pītaṃ na lohitaṃ nāvadhātāṃ(!) na³² maṃjiṣṭāṃ(!)³² na sphāṭika-varṇṇaṃ³³ = evam = evaṃ³⁴ subhūte tad³⁵ = yānaṃ³⁵ na nilaṃ na pītaṃ na lohitaṃ nāvadhātāṃ na³² maṃjiṣṭāṃ³² na sphāṭikavarṇṇaṃ³³ tenocyate
13. ākāśasamaṃ tad = yānaṃ tadyathā³¹ subhūte ākāśaṃ nātītaṃ nānāgataṃ na pratyutpannaṃ = evam = eva = tsubhūte tad³⁵ = yānaṃ³⁵ nātītaṃ nānāgataṃ na pratyutpannaṃ tenocyate ākā-
14. śasamaṃ tad = yānaṃ tadyathā³¹ subhūte ākāśasya nai(va)³⁶ hānir = na vṛddhir = na pārihāṇi:³⁷ evam = evaṃ³⁴ subhūte² tathāgatayānasya³⁸ nai[va]³⁶ hānir = na vṛddhir = na pārihāṇis = teno[cyate ā-]

Reverse.

1. kāśasamaṃ tad = yānaṃ tadyathā³¹ subhūte ākāśasya na saṃkleśo na vyavadhānaṃ(!) = evam = eva subhūte tasya yānasya³⁹ (na) saṃkleśo na vyavadānaṃ tenocyate ākāśa-[samaṃ ta-]
2. d = yānaṃ tadyathā³¹ subhūte ākāśasya notpādo na nirodho na sthitir = na bhaṃgo⁴⁰ nāpi⁴⁰ tasyānyathatva:⁴⁰ evam = evaṃ³⁴ subhūte tasya yānasya³⁹ notpādo na nirodho na sthitir = na bha-
3. ṅgo⁴⁰ nāpi⁴⁰ tasyānyathatvaṃ⁴⁰ tenocyate: ā(kā)śasamaṃ tad = yānaṃ tadyathā³¹ subhūte ākāśaṃ na kuśalaṃ nākuśalaṃ na vyākṛtaṃ nāvyaākṛtaṃ² = evam = eva subhūte tad³⁵ = yānaṃ³⁵ na ku-

4. śalam' nākuśalam nāvyākṛtam(!) nāvyākṛtam² tenocyata ākāśasamaṃ tad = yānam tadyathā³¹ subhūte ākāśam na dṛṣṭam na śrutam na smṛtam⁴¹ na vijñatam = evam = evam³⁴ subhūte
5. tad³⁵ = yānam³⁶ na dṛṣṭam na śrutam na smṛtam⁴¹ na vijñatam tenocyata ākāśasama tad = yānam tadyathā³¹ subhūte ākāśam na jñeyam (nābhijñeyam)⁴⁸ na parijñeyam na sāksīkarttavayam⁴⁸ na prahātavyam
6. na bhāvitavyam⁴⁴ = evam = evam³⁴ subhūte tad³⁵ = yānam³⁶ na jñeyam nābhijñeyam⁴⁸ na parijñeyam na sāksīkarttavayam⁴⁸ na prahātavyam na bhāvitavyam⁴⁴ tenocyata ākāśasamaṃ tad = yānam⁴⁵ tadyathā^{31, 46} su-
7. bhūte ākāśam nāpi⁴⁷ rāgadharma: na virāgadharma: piyālam tenocyata ākāśasamaṃ tad = yānam⁴⁷ tadyathā^{31, 46} subhūte ākāśam nāpi⁴⁸ kāmādhātuparyāpannam na rūpa-
8. dhātuparyāpannam nārūpyadhātuparyāpanna:m = evam = evam³⁴ subhūte tad³⁶ = yānam³⁵ nāpi⁴⁸ kāmādātu(!)paryāpanna nāpi⁴⁸ rūpadhātuparyāpanna: nārūpyadhātu(paryā)panna: te-
9. nocyata ākāśasama tad = yānam⁴⁶ tadyathā³¹ subhūte ākāśasya⁴⁹ na prathamacittotpādo na dvitīyo na tṛtīyo na caturtho na pañcama na ṣaṣṭho(!) na saptamo nāṣṭamo na na-
10. vamaś⁵⁰ = cittotpāda⁵⁰ na daśamaś = cittotpāda: evam = evam³⁴ subhūte tasya⁵¹ yānasya⁵¹ na prathamaś = cittotpādo yāva⁵² na daśamaś = cittotpādas = tenam⁵³ tad = yānam⁵⁴ = ākāśasama ity = ucyate⁵³ tadya-
11. thā³¹ subhūte ākāśe na śukle(!)vipaśyanabhūmir⁵⁴ = vvidyate² naivaṃ⁴⁸ gotravabhūmi⁵⁵ nāṣṭamakabhūmi na rdarśanabhūmir = na ttanubhūmi:r = na vigaratarāgabhūmi:r⁵⁶ = na kṛtabhūmi-
12. r⁵⁷ = evam = evam³⁴ subhūte tasmin⁵¹ = yāne⁵¹ naivaṃ⁴⁸ śuklavipaśyanabhūmir⁵⁴ = vvidyate² naivaṃ⁴⁸ yāvat⁵⁸ = kṛtabhūmir⁵⁷ = vvidyate² tenocyata*) ākāśasamaṃ tad = yānam tadyathā³¹ subhūte
13. ākāśe naiva⁴⁹ srotaāpattiphalam⁵⁹ vidyate² (na) sakṛdāgāmiphalam nānāgāmiphalam nārhatvaṃ vidyate² evam = eva subhūte tasmāin⁵¹ = yāne⁵¹ naiva⁴⁸ srotaāpa[ttipha-]
14. lam⁶⁰ naiva⁴⁸ yāvad⁶¹ = arhatvaṃ⁶¹ tenocyate ākāśasama tad = yānam tadyathā³¹ subhūte ākāśe na śrāvakahūmir = na pratyekabuddhabhūmir = na⁶² samyaksambuddhabhūmi.

¹ svaro 'bhāvo. ² missing. ³ dikṣu aprameyāsamkhyeyān. ⁴ abhivyajñāpayati (!). ⁵ bhāvo 'bhaviṣyan nābhāvo. ⁶ prā°. ⁷ apravarttanīyaṃ. ⁸ devena vā māreṇa vā brahmaṇā vā substituted for yāvat. ⁹ syārhatāḥ samyaksambuddhasya. ¹⁰ °vo. ¹¹ °vas. ¹²⁻¹² tathāgato 'rhan samyaksambuddho dharmmacakram pravarttayaty apravarttanīyaṃ. ¹³ devena māreṇa vā. ¹⁴⁻¹⁴ sattvā bhāvo 'bhaviṣyan nābhāvo. ¹⁵ kṛte. ¹⁶ tenārhatā samyaksambuddhena. ¹⁷⁻¹⁷ neha te sattvā anupadhiṣeṣe niruvāṇadhātavaḥ pariṇiravāpayiṣyat. ¹⁸⁻¹⁸ sattvā abhāvo na bhāva vā (!). ¹⁹ sattvā anupadhiṣeṣe. ²⁰ °tāś. ²¹ °syati ca. ²²⁻²² missing. ²³⁻²³ yat punaḥ subhūtir evam āha | ākāśasamaṃ tad yānam iti |. ²⁴ tadyathāpi nāma subhūte ākāśasya. ²⁵ nādho. ²⁶ tasya mahāyānasya. ²⁷ na pūrvvā. ²⁸⁻²⁸ missing. ²⁹ The text adds: tenocyate ākāśasamaṃ tad yānam. ³⁰⁻³⁰ This passage missing. ³¹ °thāpi nāma. ³² nāñjiṣṭham. ³³ sphūṭīkarajatavarṇam. ³⁴ eva. ³⁵ tan mahāyānam. ³⁶ na. ³⁷ pa°. ³⁸ tasya mahāyānasya. ³⁹ mahāyānasya. ⁴⁰ viṣṭhīr na sthīr anyathātvaṃ(!) prajñāyate. ⁴¹ mataṃ. ⁴² I have inserted this word from line 6; Śatas. Pr. has here: nāñjneyaṃ na vijñeyaṃ. ⁴³ sāksīka°. ⁴⁴ bhāvayī°. ⁴⁵ Śatas. Pr. adds here: tadyathāpi nāma subhūte ākāśam na vipāko na

* °te corrected to °ta.

vipākadharma evam eva subhūte tan mahāyānaṃ na vipāko na vipākadharma tenocyate ākāśasamaṃ tad yānaṃ | .⁴⁶⁻⁴⁸ These two sections occur in Śatas. Pr. in reverse order.⁴⁷⁻⁴⁷ *na sarāgaṃ na virāgaṃ na sadveṣaṃ na vigatadveṣaṃ na samohaṃ na vigatamohaṃ* | *evam eva subhūte tan mahāyānaṃ na sarāgaṃ* etc. *tenocyate* etc.⁴⁸ *na*.⁴⁹ *ākāśe*.⁵⁰ *navamo*.⁵¹ *tatra mahāyāne*.⁵² The numbers 2—9 repeated.⁵³⁻⁵³ *tenocyate ākāśasamaṃ tad yānaṃ*.⁵⁴ *śuklavidaśānā*°. ⁵⁵ *gotrabhūmir*.⁵⁶ *vitaraṅga*°. ⁵⁷ *kṛtāvibhūmir*.⁵⁸ All terms repeated in Śatas. Pr. ⁵⁹ *śrotā*°. ⁶⁰ *śrotā*°. ⁶¹ Śatas. Pr. repeats the terms, but omits *arhatvaṃ*. ⁶² Śatas. Pr. adds: *bodhisattvabhūmir na*

Our fragment shows a predilection for short expletives, like *hi*, *api*, *tu*, *eva*, which do not occur in the corresponding text of the Śatas. Pr.; but otherwise it is less prolix in style. While the Śatas Pr. everywhere has the full title of the Buddha, our fragment generally uses *tathāgata* alone; instead of repeating terms, the fragment makes frequent use of the comprehensive style with *yāvat* or *piyālam*. For the cliché *tadyathāpi nāma*, our fragment has only *tadyathā*, and for *mahāyāna* simply *yāna*, or *tathāgatayāna*. Among other discrepancies I may draw attention to the passive construction, obv. l. 4: *tathāgatena* . . . *pravarttitam*, where the printed text has *tathāgato rhan* etc. *pravarttayati*; *apravarttitam* in the fragment (obv. l. 3, 4) for *apravarttanīyam*; the neuter gender in *satva*. Individual words, too, differ. The fragment uses the expression *heṣṭimā dik*, where the edition has the pure Sanskrit word *adho*; °*vipāśyana* for °*vidarśanā*; *anutpādaśeṣa* as an epithet for *nirvāṇa* where Śatas. Pr. has the more usual *anupadhiśeṣa*. In the fragment, *smṛtam* stands for *matam*, *abhijñeyam* for the two words *ājñeyam*, *vijñeyam*; the opposite to *sthiti* is rendered in the fragment by *bhaṅga*, in the text by *viśthiti*, the *rāgadharma*-section (rev. l. 7) differs widely from the corresponding section in the Śatas. Pr. Two sections occur in reverse order (see note ⁴⁶), and one section in the fragment is missing in the edition (note ³⁰) and *vice versā* (note ⁴⁵).

The discrepancies are, thus, large enough to justify the conclusion that our fragment represents another class of manuscripts than those on which the Bibl. Ind. edition is based, or rather, especially having regard to the difference in the division into chapters, belongs to some other of the numerous Prajñāpāramitā recensions; possibly to the same as that represented by fragment 8, though they cannot form part of the same manuscript.

The scribe who is responsible for this manuscript excels far more in calligraphic skill than in accuracy and scholarship, though of course it is impossible to know where the MS. from which he copied may have been at fault. He is very inconsistent with his anusvāras, leaving them out where they ought to be, and putting them in where they have no business to stand (e. g. *tenaṃ*, *evaṃ* for *eva*; *tad yānaṃ*). A double consonant is sometimes written single (*tasmā tathā*° obv. l. 1, 4; *yāva na* rev. l. 10). Short *a* for long *ā* occurs in some places (e. g. *nāvadhātam* for *nāvadhātam*; *pūrva*°, obv. 8, probably does not stand for *pūrvaḥ* but for *pūrvā*, with misplaced punctuation), and long for short (e. g. *śaṣṭyāṅgopeta*, obv. 1, twice; *nā vyākṛtam*, rev. 4). Whether *pārihāṇi* (obv. 14) is a peculiarity of the language or a scribe's error is difficult to say. *dh* frequently stands for *d* (*avadhāta* obv. 12, twice; *vyavadhānam* rev. 1, but lower down *vyavadhā*°), and once *d* for *dh*: *kāmadātu*° (rev. 8). Just as visarga is frequently left out, so is final *r* often missing; in °*bhūmi na rdarśana*° (rev. 11) the *r* has been misplaced. Upādhmāniya occurs once, obv. 10: °*vidiśaḥ prajñāyaṃte*; it is marked exactly as in Plate VI, l. 5, in professor Pischel's paper 'Bruchstücke des Sanskritkanons' (Sitz. Ber. d. Berl. Ak. d. Wiss., 1904).

Some of the errors: placing the anusvāra before *m*; the interchange of *d* and *dh*; the

doubling of initial *t* in *ttasmāt* (obv. 6), *ttanu* (rev. 11); *ts* for *s* in *tsvaro* (obv. 1), *tsubhūte*, (obv. 8. 13);¹ *tasmain* for *tasmin* (rev. 13), appear to me to favour the conclusion that the scribe was of »Khotanese« nationality; such peculiarities, as far as my experience goes, being of frequent occurrence in Khotanese manuscripts.

After *r* consonants (except *m*) are generally, but not consistently doubled, even in such places as *bhūmir vvidyate*. Euphonic *r* occurs once: *subhūte-r-evam* (obv. 8). Final *-an* appears to become *-am*: *arham samyak*^o (obv. 1; in (*a*)*rha samyak*^o, obv. 2, the anusvara is omitted).

Grammatically, there are few remarks to be made. The augment is placed before the præfix in *aparinirvāpayiṣyat* (obv. 5); the form *pūrvasyā dik* shows a curious confusion.

A peculiar word is *buddhāhaka* (obv. 7); *āhaka* (from root *āh*) seems to stand for the usual *bhāṇaka*.

Fragment 8. (Plate VI). A complete leaf in good condition; 21 ⁵/₈ in. by 6 ⁷/₈ in.; string-hole 5 ³/₈ in. from left-hand edge. Paper buff, thick and firm, with narrow, longitudinal, not very distinct waterlines; transversal waterlines, 14 in number, at somewhat irregular intervals, on the left half slightly slanting and curved. Script rather large, 11 lines to the page, in many places worn off on the reverse. The leaf is numbered 147 on left-hand margin of obverse.

The fragment is divided into two sections, of which the first ends obv. l. 5.

Obverse.

1. yāvad = abhāvasvabhāvaśūnyatā svapnopamā māyopamā ca· smṛtyupasthānāni svapnopamāni māyopamāni ca· yāvad = aṣṭādaśāvedanikā buddha[dharmā] svapnopamā māyopamāś = ca·
2. srotāpattiphalam = api svapnopamaṃ māyopamaṃ ca· evaṃ sakṛdāgāmiphalam = anāgāmiphalam = arhatvam = api svapnopamaṃ māyopamaṃ ca· evaṃ pratyekabodhir = anuttarā pi samyaksambodhi devaputrā: sva-
3. pnopamā māyopamā ca· atha te devaputrā r-āyusmantam subhūtim = etad = avocan sammyaksambodhir = apy = āyusmaṃ subhūte svapnopamā māyopamā ca vadasi nirvāṇam = apy = āyusmaṃ subhūte vā-
4. vatsi: svapnopamaṃ māyopamaṃ ca· āyusmāṃ subhūtir = āha: nirvāṇam = apy = ahamn = devaputrā: svapnopamaṃ māyopamaṃ ca vāvadmi: sacet = punar = devaputrās = tato nirvāṇād anyā: kaś = cid = dharmo vi-
5. śiṣṭataro py = abhaviṣyat = tam = apy = ahan = dharmam svapnopamaṃ māyopamaṃ cāvadiṣyat² tat = kasmād = dhetos = tathā khalu devaputrā: svapnaś = ca māyā ca nirvāṇam cādvayam = etad = advayādhikāraś = ceti ||
6. athāyusmāṃ śāradvatīputrāyusmāś = ca mahāmaudgalyāyāṇāyusmāṃś = ca mahākauṭīla: āyusmāṃś = ca mahākātyāyana: āyusmāś = ca pūrṇo maitrāyaṇī-putrāyusmāś = ca mahā-
7. kāśyapo anekāni ca bodhisatvasahasrāṇi āyusmantam subhūtim = etad = avocan

¹ Cf. Khotanese *saṃsāra* (LEUMANN, Zur Nordarischen Sprache und Literatur, p. 138th).

² Read: ^o*ṣyam*.

- ko syā: bhadanta subhūte r-evaṃ gaṃbhīrāyā: prajñāpāramitāyā: evaṃ dudṛ-
śāyā r-e-
8. vaṃ duranubodhāyā: evaṃ śāntāyā: evaṃ sūkṣmāyā: evaṃ nipunāyā: evaṃ praṇi-
tāyā: praticchako bhaviṣyati· athāyuṣmān = ānandas = tān = mahāśrāvakān
= tā ca bodhisatvā-
9. n = mahāsatvān = etad = avocan avaiivarttikā r-āvusā: bodhisatvā mahāsatvā:
asyām = evaṃ gaṃbhīrāyā: atarkikāyā r-atarkyāvacarāyā: sūkṣmanipunadurḍṛ-
śaduravabodhāyā: c-
10. vaṃ śāntāyā: evaṃ praṇitāyā: alamāryapaṇḍitavidvedanīyāyā: prajñāpāramitāyā:
praticchayitāro bhaviṣyanti· drṣṭasatyā vā paryavagāḍhadharmāṇo arhanta:
paripū-
11. rṇasamkalpā: pūrvvajinakṛtādhikārā vā bodhisatvā mahāsatvā: bahubuddhakoṭya-
varopitakuśalamūlā: kalyāṇamitrapariḡhītā vā kulaputrā: kuladuhitaro vā· ye
syāṃ

Reverse.

1. prajñāpāramitāyā: evaṃ gaṃbhīrāyā: peyālam· yāvad = alamāryapaṇḍitavidvede-
danīyā: (*sic.*) deśyamānāyā: praticchitāro bhaviṣyanti· te ca punar = na rūpaṃ
śūnyam = iti vikalpayiṣyanti
2. na śūnyatā rūpaṃ = iti vikalpayiṣyanti· evaṃ na vedanān = na saṃjñān = na
saṃskārān = na vijñānaṃ vijña¹ śūnyam = iti vikalpayiṣyanti na śūnyatām vijñā-
nam = iti vikalpayiṣyanti· na rūpaṃ = ānimittam = i-
3. ti vikalpayiṣyanti· nānimittam rūpaṃ = iti· na vedanāṃ na saṃjñāṃ na saṃskārān
= na vijñānam = ānimittam = iti vikalpayiṣyanti nānimittam vijñānam = iti· na
rūpaṃ = apraṇihitam = iti vikalpayi-
4. ṣyanti· nāpraṇihitam rūpaṃ = iti· evaṃ vedanāṃ saṃjñāṃ saṃskā[rā]n = na
vijñānam = apraṇihitam = iti vikalpayiṣyanti· nāpraṇihitam vijñānam = iti·
evaṃ peyālam· na rūpaṃ = anutpādam = iti
5. vikalpayiṣyanti· nānirodham = iti vikalpayiṣyanti· na viviktam = iti vikalpayiṣyanti·
evaṃ ve[danā]saṃjñāsaṃskārān = na vijñānam = anutpādam = iti vikalpayiṣy-
anti· nāniro-
6. dham = iti nāviviktam = iti vikalpayiṣyanti· na rūpaṃ śāntam = iti vikalpayiṣy-
anti· na vedanā[samjñāsam]skārān = na vijñānaṃ śāntam = iti vikalpayiṣyanti
peyālam· evaṃ cakṣuṣi [ka-]
7. rtavyaṃ· yāvac = cakṣusaṃsparsapratyayā vedanāyām = evaṃ manasi kartavyaṃ·
yāvan = mana:samspa[rśapra]tyayā vedanāyām = evaṃ dānapāramitāyāṃ kar-
tavyaṃ· yāvat = prajñāpārami-
8. (tā)yām = evam = adhyātmasūnyatāyāṃ kartavyaṃ· yāvad = abhāvasvabhāvaśū-
nyatāyām = evaṃ smṛtyupasthāneṣu kartavyaṃ yāvad = aṣṭādaśasv = āvedani-
keṣu buddhadharmeṣu evaṃ sarvasamādhiṣu sa-

¹ These two akṣaras are crossed over.

9. rrvadhāraṇimukheṣu kartavyaṃ evaṃ srotāpattiṃhale kartavyaṃ yāvad = arhatve kartavyaṃ· pratyekabodhi cā x z x z x z sarvvākārajñatām *sūnyam* = iti vikalpayiṣyanti na sūnyatām sarvvākārajñatā-
10. m = iti· na sarvvākārajñatām = ānimittam = iti vikalpayiṣyanti· nānimittam sarvvākārajñatām = iti· na [sarvvākāra]jñatām = *apraṇihitam* = iti vikalpayiṣyanti· nāpraṇihitam sarvvākārajñā-
11. tām = iti· nāsaṃskṛtadhātum sūnyatām = iti vikalpayiṣyanti· na sūnyatām saṃskṛtadhātum = iti· evaṃ na [saṃskṛta]dhātum = ānimittam = iti vikalpayiṣyanti nānimittam = iti saṃskṛtadhātum.

This fragment, like the preceding one, belongs to a text closely allied to the *Śatasāhasrikā Prajñāpāramitā*, and possibly forms part of this very text.

In the *Śatas. Pr.*, as will be seen from the parts hitherto published in the *Bibl. Ind.*, the same list of technical terms is constantly repeated, generally in the same order of sequence, and otherwise, too, with but slight variations. These terms may be divided into the following categories: —

1. The five skandhas. 2. The twelve āyatanas, *cakṣus* to *manas*, and *rūpa* to *dharma*, generally in the same order as in *Dharmasaṃgraha* 25,¹ together with the 18 dhātus, as enumerated in *Mahāvvyutpatti* 107; or, more frequently: a) *cakṣurvijñānam*, *śrotra-*, *ghrāṇa-*, *jihvā*, *kāya-* and *manovijñānam*; b) *cakṣuḥsaṃsparśaḥ* to *manaḥsaṃsparśaḥ*; c) *cakṣuḥsaṃsparśajā* (or:°*saṃsparśapratyayā*) *vedanā* to *manaḥsaṃsparśajā* (or °*pratyayā*) *vedanā*.² 3. The six elements (*prthivīdhātu*, *abdhātu*, *tejo-*, *vāyu-*, *ākāśa-*, and *vijñānadhātu*). 4. The twelve Causes (No. 12 given in the brief form as *jarāmaṇam*). 5. The six pāramitās. 6. The eighteen sūnyatās, as in *Mahāvvy.* 37. 7. The (four) smṛtyupasthānas.³ 8. The (four) samyakprahānas. 9. The (four) ṛddhipādas. 10. The (five) indriyas. 11. The (five) balas. 12. The (seven) bodhyaṅgas. 13. (āryāṣṭāṅga)mārga (groups 7—13 forming together the 37 *bodhipākṣikā dharmāḥ*, as given in *Dharmasaṃgraha* 43). 14. The (four) āryasatyas. 15. The (four) dhyānas. 16. The (four) apramāṇas. 17. The (four) ārūpyasamāpattis. 18. The (eight) vimokṣas. 19. The (nine) anupūrvavihāra(samāpatti)s. 20. *sūnyatānimittapraṇihitavimokṣamukhāni* (also styled sūnyatā etc. samādhi (p. 145), or *trayaḥ samādhayaḥ* (p. 1439). 21. The (five, or six) abhijñās. 22. (*sarva*)*samādhayaḥ*, or *samādhimukhāni*.⁴ 23. (*sarva*)*dhāraṇimukhāni*. 24. The (ten) tathāgatabalas. 25. The (four) vaiśāradyas. 26. The (four) pratisampads. 27. mahāmaitrī. 28. mahākaraṇā. 29. The (eighteen) *āveṇikabuddhadharmāḥ*. 30. śrotaāpatti-, sakṛdāgāmi-, anāgāmiphala, arhattva. 31. pratyekabodhi. 32. (mārgākārajñatā), sarvvākārajñatā.

¹ P. 283 the āyatanas are enumerated in the order of *Mahāvvyutpatti* 106: *cakṣūrūpam śrotasābdān* etc.; the dhātus are missing here.

² P. 340 sqq. and again, p. 379 the terms in this category are enumerated as follows: *cakṣus*, *rūpa cakṣurvijñāna*, *cakṣuḥsaṃsparśa*, *yad api taccakṣūrūpacakṣurvijñānacakṣuḥsaṃsparśapratyayād utpadyate vedayitam sukham (vā) duḥkham vā (aduḥkhāsukham vā)*, and in the same way in regard to the five remaining senses (p. 345 °*cakṣurvijñāna*° omitted, as appears from the parallels, accidentally).

³ In groups 1—6 the terms are generally enumerated separately, but in the following categories only the number of terms comprised in them is occasionally mentioned.

⁴ *Mahāvvy.* 21 gives a list of 118 samādhis; in the published parts of *Śatas. Pr.* the samādhis are enumerated in four places: pp. 825—35, 1412—14, 1415—26, and 1531—33. The list given in the second place is the most

complete, if not always the most correct one; the first list contains 115 names, in the third list no less than ten names are left out, and in the fourth, two are missing. The second list contains, apparently, 121 samādhis, but their number is here really 118, as in Mahāvya., since three occur twice. Leaving aside minor discrepancies, such as may reasonably be accounted for by faulty mss. of the Śatas. Pr., or indifferent editing, and correcting the list p. 1412 sqq. with the aid of the other lists, the relations between the list of Mahāvya. and the second, and completest, list of the Śatas. Pr., will be found from the following concordance:

Mahāvya.	Śatas. Pr.
	1—2 = 1—2
	3 = 4
	4 = 3
	5—6 = 5—6
	7 (only p. 825)
	8—17 = 7—16
18 adhivacanapraveśo	17 adhivacanasampraveśo
	19—28 = 18—27
29 vyatyasto	28 vyastasto (p. 1412; vyabhasto p. 828, 1531; missig in third list.)
	30—31 = 29—30
32 anīmiṣo	31 anadyo (p. 1412); aneṣo (p. 828, 1417) aṣeṣo (p. 1531)
	33—37 = 32—36
	— 37 samantāvabhāso
	38—45 = 38—45
	46 = 49
	47 = 48
	48 = 47
Mahāvya.	Śatas. Pr.
49 anīñjyo	46 anīñjo
	50—68 = 50—68
69 aprakaro	70 aprakāro (p. 831, 1417, 1532); prabhākaro (p. 1413)
	70 = 69
	71—74 = 71—74
75 acalo; v. l. abalā	75 acalo (p. 831, 1421, 1532) avalā (p. 1413)
	76—79 = 76—79
	80 = 81
	81 = 80
	82—89 = 82—89
90 ākārānapakāro; v. l. °vakāro	90 ākārānavakāro
91 nairvedhikasarvabhavatamopagato	91 °bhavatalāpagato (p. 833, 1414, 1532; °lavigato p. 1423)
	92 = 92
93 nirghoṣākṣaravimukto	93 girgho° (girigho°, p. 833, 1532)
	94—97 = 94—97
	98—99 = 99—100
	100 = 101
101 sarvarodhavirodhāsampraśamano (v. l.	102 °nirodha° (p. 834, 1414); °virodhāsam°

Our fragment begins with the last of the 18 *sūnyatās* (category 6 in the above list); after mentioning group 7 it indicates with *yāvad* the terms included in groups 8 to 29, inclusive, mentions the items in group 30, adds after 31 *samyaksambodhi* and *nirvāṇa*, but leaves out group 32.

Of all these conceptions the terms *svapnopama* and *māyopama* are predicated. These words, of course, belong to the *loci communes* of Buddhist literature. The *Śatas. Pr.* uses them, and five other adjectives ending in *upama*, as attributes to the five *upādānaskandhas* (p. 540 sqq.); similar predicates occur again p. 906, and pp. 907—10 (cf. *Mahāvvy.* 30, 49). The lists of such predicates are, as far as I am aware, in *Śatas. Pr.* always headed by the two words used in the fragment.

In the second section of this fragment, beginning obv. l. 6, the enumeration of the categories mentioned above starts again on rev. l. 1. The five *skandhas* (category 1) are treated with great prolixity; in group 2 (l. 6 sqq.) the first and last terms only are mentioned (*cakṣus* to *cakṣuḥsaṃsparśa°*). Groups 3 and 4 are left out. Such omissions are not infrequent in *Satas. Pr.*; thus, in an enumeration of terms, p. 378—382, 3 and 4 are missing, and other groups are added. Groups 5 and 6 are briefly indicated by their first and last terms, whereupon groups 7 to 29 are mentioned in the same way as above. Categories 22 and 23 are then mentioned separately, which would indicate that they are not included in the text of which this fragment forms part between the *smṛtyupasthānāni* and the *āvedanikā buddhadharmāḥ*. In *Śatas. Pr.* a similar order of the groups is sometimes observed; thus, for instance, pp. 553—582 I have found the following order: 1—5; 7—20; 24—29; 21—23; here some of the categories are omitted. A careful investigation into the order of terms might give a clue as to the sources from which these long compositions are derived.

The terms in group 30 are mentioned cursorily, as is category 31, *pratyekabodhi*; of group 32 only the latter term, *sarvākārajñatā*, is given, but it is treated more fully, though not so many predicates are used here as in group 1. The following term, *saṃskṛtadhātu*,¹ and its reverse, *asaṃskṛtadhātu*, are sometimes inserted in the *Śatas. Pr.* enumerations, as p. 380, after group 2, and immediately before group 5.

In this latter section the groups of terms are placed into relation with seven predicates: *sūnyam* (*sūnyatā*), *ānimittam*, *apraṇihitam*, *anutpādam*, *anirodham*, (*a*)*viviktam*, and *sāntam*. I have not found these terms grouped together in this manner anywhere in *Śatas. Pr.* The three first are identical with the terms in group 28 above, and they occur frequently in combination with other predicates. Thus, pp. 335—371 a number of upwards of 30 words are repeated no less than 35 times, being predicated in turn of each of the five *skandhas* and of each

°nirodha°	(p. 1532); °prati- rodhapra° (p. 1424).
102 = 98	
103—108 = 103—108.	
109 <i>sarvākāraprabhākaro</i>	109 (p. 1425, 1532) <i>sarvalokapra°</i> (p. 834, 1414)
110—118 = 110—118.	

¹ The reading of the fragment, *nāsaṃskṛtadhātuṃ* should be emended to *na saṃ°*.

of the 30 terms in group 2 (cakṣus etc.); this list of predicates includes *śāntam*, *aśāntam*, *śūnyam*, *aśūnyam*, *nimittam*, *animittam* (or *āni*^o) *praṇihitam*, *apraṇihitam*, *viviktam*, *aviviktam*; also *utpāda*, *nirodha*. On pp. 543 sq., immediately after the predicates ending in *upama* (pp. 540—42), we find a combination of terms beginning with *vivikta*, *śānta*, *anutpāda*, *anīrodha*.

All the seven predicates of our fragment thus appear in different combinations in the Śatas. Pr.

For the usual name of group. 29, *āveṇikā buddhadharmāḥ*, our fragment uses in both places (obv. 1 and rev. 8) the curious term *āvedanikā buddhadharmāḥ* which I have found nowhere else. The word *āvedanika* is evidently a vṛddhi derivative from *a-vedanā*, and has the appearance of an explanatory Sanskritization of the obscure Prākṛit (or Pāli) word *āveṇika*.

The language of the fragment is a fairly typical Buddhist prose Sanskrit. Apart from obvious scribe's errors, such as the omission of the anusvāra, the sandhi, as would be expected, is rather irregular. The use of euphonic *r* is unusually abundant: *devaputrā-r-āyusmantam* (obv. 3), *durdṛśāyā-r-evaṃ* (obv. 7), *atarkikāyā-r-atarkyā*^o (obv. 9), *avaivarttikā-r-āvusāḥ* (ibid.); *subhūte-r-evaṃ* (obv. 7). In final *-an* and *-ān*, *n* becomes anusvāra before sibilant: *āyusmaṃ subhūte* (obv. 3, twice), *āyusmāṃ subhūtir* (obv. 4), *āyusmāṃ śāradvatīputra* (obv. 6). Obv. l. 8 we have *tā ca* for *tāmś ca* (but *āyusmāmś ca*, obv. 6, twice). In final *-am* and *-ām*, *m* frequently becomes *n* before dentals: *ahan dharmam* (obv. 5) *ahamṇ deva*^o (obv. 4); *vedanān na*, *saṃjñān na* (rev. 2; but rev. 3: *vedanām na*, *saṃjñām na*; cf. also *evaṃ na*, *evaṃ ni*^o, *evaṃ dāna*^o).

After *r*, *v* is always doubled¹ but of other consonants, *t* is once only written double (*avaivarttika*, obv. 9).

The locative *asyām* (*asyām* = *evaṃ*, obv. 9, (*a*)*syām pra*^o, obv. 11) stands twice with the genitive *prajñāpāramitāyāḥ*, and its numerous attributes, also in the genitive. This may be due merely to a clerical error, or to a confusion of the two cases; in the former instance, *m* may be euphonic.

Among peculiar words the following may be noted: —

pratichako (obv. 8), *pratichayitāro* (obv. 10), *pratichitāro* (rev. 1). BR. gives the word *pratichaka* with a reference from Manu 4, 194. The two other forms are typical Prākṛitisms.

Another Prākṛitism is *āvusāḥ* (obv. 9).

atarkika (obv. 9) is not found in any dictionary; it is equivalent to *atarkya*, and I have come across this word in *Saddharmapuṇḍarīka* II, v. 18: *gambhīradharmā sukhamā pi buddhā atarkikāḥ sarvi anāsravāśca*. As in our fragment *atarkika* and *atarkyāvacara* are combined, so *atarka* and *atarkāvacara* occur together in *Saddharmap*, II, p. 39¹², *Madhyamakavṛtti* XXIV (p. 498¹⁰) and in *Divyāvadāna* XXXV (p. 492¹⁹). The expressions used in *Divyāv.* are rather similar to the passage in our fragment. It runs: — *gambhīro me dharmo gambhīrāvabhāso durdṛśo duranubodho 'tarko 'tarkāvacaraḥ sūkṣmo nipuṇapaṇḍitavijñavedanīyaḥ*.² We find here a

¹ I have transcribed *sarva*, *nirvāṇa*, though the second *v* has more the shape of *b*, as frequently happens in Gupta script (e. g., in fragments 3 and 7, above).

² The edition has *°caro 'sūkṣmo 'nipuṇa*^o, but I think the elision should be left out; *°caro* before *sūkṣmo* (Mss. *śūkṣmo*) can be irregular sandhi; the Mss. here also read *nipuna* (with dental *n*), as in our fragment.

variant to *alamāryapaṇḍitavidvedanīya* in the fragment (obv. 10, rev. 1); *paṇḍitaviṅṇavedanīyaḥ* also occurs in *Madhyamakavṛtti*.

I do not think *paryavagāḍhadharman* (obv. 10), (Pāli *pariyogāḍhodhammo*) has ever been noted in a Sanskrit text.

The name *Mahākauṣṭhila* (obv. 6) has many variants. Mahāv. 47, 35 gives the form *Mahākauṣṭhila*; so also Saddharmap. p. 2, and Burnouf, Introd. p. 448, but p. 564 °*kauṣṭhilya*. Sukhāv. p. 2 has *Mahākauṣṭhilya*, with the *v. l.* *Kauṣṭhila*. Avad. Śat. II, 195' has *Koṣṭhila* (with the *v. l.* *Koṭhila*); so also *Kern Buddhismus*, I, 224. The Pāli equivalent is *Mahākoṭṭhito* (Mahāv. X, 5, 6. Cullav. I, 18, 1).

Fragment 9. (Plate VII). A considerable piece on the left torn away, leaving the edge very ragged and irregular in shape. Length 19 to 15 1/2 in., breadth 8 in. Some seven or eight akṣaras from the longest line preserved seem to be missing, which would make the original length 23 in. String-hole, on the basis of this calculation, 8 in. from left-hand edge. Paper light brown, fairly thick in patches; longitudinal waterlines somewhat curved near right edge. Bold, beautiful writing of a somewhat angular type; the ink has in many places disappeared. Ten lines.

The suggestions at restoration of some lines found in the reproduction of this fragment are merely tentative.

Obverse.

1. (About 17 akṣaras missing) *ximāyāt tat = kiṃ manyase śāradvatīputra bahavas = te akṣobhiṅyo bhaveyur = mārasainya . . .¹ bahavas = te*
2. (14 or 15 akṣ.)² [*. . . tat kiṃ ma]nyase śāradvatīputra te vārhanas = te va mārasainya: pratibalās = te avaiartikasya bodhisatvacittam vivartanāya*
3. (15 akṣ.) [*. . . tat kiṃ] manyase śāradkatīputra katamas = ta bho balavatara cittam yaś = ca teṣāṃ satvānāṃ kṣiṅāsravacittam arhacittam yo*
4. (12 akṣ.) [*vā avaiartikasya bodhisatvasya] ba[la]vaṃttataram cittam āha bodhisatvacittam bhagavā balavantatara: avaiarttikasya bhagavān = āha paśya śāradvatīputra a-*
5. (11 akṣ.) *rmiṅaṃ xz aprameyā akṣobhiṅya mārasainya sarāgasadoṣasamohacittam na śakyate paryādayitum vigatarāgai viga-*
6. (8 akṣ.)³ [*tadoṣair vigatamohai]ś = c[i]ttai: tat = kiṃ manyase cchāradvatīputra kataram cittam eṣāṃ cittānāṃ agram = ākhyāyati yāvati = uttaram = ākhyāyati āha a-*
7. (8 or 9 akṣ.) [*vaivartikasyaiva bhagavan(?)] bodhisatvasya cittam = agram = ākhyāyati yāvati = uttaram = ākhyāyati tat = kasmād = dhetos = tathā hy = anāsravacittair = na śakyate paryādiya pu-*

¹ A small piece, the space of two or three akṣaras, is torn off here.

² Here, as elsewhere, including the conjectured ones.

³ From this line, which can be restored with a fair amount of certainty, I have calculated the number of missing akṣaras in the other lines.

8. (7 akṣ.) [nar evāha śāradva]tīputra tvā caiva pariprakṣyāmi yathā te kṣamati tathā kuruṣva tat = kiṃ manyase śāradvatīputra yadi kācamaṇikānām madyai¹ vaidūryaratnaṃ
9. (7 or 8 akṣ.) [sthāpitaṃ bhavet sarva-]² kāmcamaṇikā paryādīyeta ta:d = vaidūryaratnaṃ pariśodyā vā aggheta³ vā varṇena vā āha no iti bhagavāṃ sumahatīr = i-
10. (10 akṣ.) [yam api kācamaṇikarāsīr(?) v]ai[dūrya]ratnaṃ na śaknoti paryādīyanāya āha kim = atra kāraṇaṃ śāraṇaṃ⁴ śāradvatīputra āha kācamaṇikā bhagavā

Reverse.

1. (12 akṣ.) na(?) mūlyena nārgheṇa kācamaṇikā śakyate vivarṇikartuṃ varṇakaraṇaṃ ca nodāra eṣa bhagavān yaduta kācama-
2. (7 or 8 akṣ.) [ṇikānām varṇa yah] punar = bhagavān gotragavo bhavati karmavipākaniryātaṃ satvānām mahāsamudrā utpadyate sa bahubhi: kācamaṇikair = na śa-
3. (7 or 8 akṣ.) [kyate paryādayitum] āha evam = eva śāradvatīputra avaivartikasya bodhisatvasya yaś = cittaṃ sa sarvaśrāvākānām(!) cittaṃ = abhibhavati saryathā xz
4. (8 akṣ.) [. . . vaidūrya]ratnaṃ kācamaṇikānām madye sthāpitaṃ sarvakācamaṇikānām prabhā pratihatā bhavaṃti abhūtā bhavati: na prajñāyate.
5. (8 or 9 akṣ.) [evam eva śāradvatī]putrāvaivartikasya bodhisatvasya cittaṃ sarvaśrāvākacittāni abhibhavitvā tiṣṭhati idam = api śāradvatīputra a-
6. (9 or 10 akṣ.) [. . . p]una: tathāgata avaivartikasya bodhisatvacittaṃ = agra sthāpayati yāvatiṃ = uttaraṃ sthāpayanti yad = api bodhisat-
7. (10 akṣ.) [tvasya avaivartikasya citta]ṃ karuṇāsahagataṃ sarvaśrāvakai: na śakya paryādayitum na śakya bho: puna śāradvatīputra te arhantā: kṣiṇāsravā:
8. (13 or 14 akṣ.) tuṃ na tv = evāvaivartikasya bodhisatvasya śakyaṃ cittaṃ pa(!) paryādayitum śakṣyanti khalu puna: śāradvatīputra te arhantā:
9. (13 or 14 akṣ.) [kṣiṇāsravā idam api mahāsamu]draṃ mukhavāte⁵ cchoṣayitum na tv = aivāvaivartikasya bodhisatvasya śakyaṃ cittaṃ paryādayitum śakṣyanti ho puna sā-
10. (16 akṣ.) [radvatīputra] ṣaḍabhijñā: gaṃgānadivālukasamai lokadhātubhi: sumeruparvatarājā te⁶ kha xz xz.

I am not in a position to say of what text this fragment forms part: perhaps others, better versed in Buddhist lore, may be able to give a clue for its identification.

There is just enough missing of each line to make the fragment difficult to understand.

¹ For *madye* = *madhye*; cf. rev. l. 4.

² Cf. rev. l. 4.

³ Read: *arghena* (for °ṇa), cf. rev. l. 1.

⁴ The scribe has confused the end of the preceding and the beginning of the following word.

⁵ Read: °*vātena*. ⁶ Piece torn off.

The general trend of the argument is, however, fairly plain. The hosts of Māra, however numerous, are not capable of making a bodhisatva, who does not swerve in his resolve, turn back; the mind of an unswerving bodhisatva is superior to the mind of a mere arhat, even though he has escaped from sin. Cannot the mind (of the Māra hosts(?)¹, full of passion, hatred, and delusions, be overpowered (*paryādayitum*) by the minds free from passion, hatred and delusions? Therefore, the bodhisatva mind is called the foremost, and the uttermost. If a lapis lazuli gem be placed amidst glass beads, the glass beads could not eclipse (*paryādīyeta*²) the lapis lazuli gem by their lustre (*parisodyā*, for *parisodhyā*), or value, or colour: . . . »For this, Exalted One, is not excellent, to wit, (the colour of) glass beads«. He who becomes a leader of the herd (?*gotragavo*) of the beings that proceed for the maturation of their actions (who is) born of the Ocean(?) he cannot (be surpassed) by many glass beads. Just so, the mind of an unswerving bodhisatva surpasses the mind of all śrāvakas. »Just as, when a lapis lazuli gem is placed amidst glass beads, the splendour of the glass beads is defeated, becomes non-existent, is not to be recognized, just so, Śāradvatīputra, the mind of an unswerving bodhisatva stands superior to the minds of all śrāvakas.« —

This piece differs in language from the preceding prose fragments; it is far more dialectically coloured, and comes near the idiom known, for instance, from the Mahāvastu.

In *mahāsamudrā utpadyate* (rev. 2) we may have a Prākritic ablative, unless *u* (quite plainly written) stands for *du*³; *mārasainya* (obv. 1. 2. 5.) and *mārasainyaḥ* are plural forms, with short final vowel. Stems in *-nt* are increased by an *a*: *arhantāḥ* (rev. 7. 8), nom. pl. (also *arhantas* obv. 2.); further, in *balavaṃttatara* (obv. 4) and *balavantatara* (obv. 4); *balavatara* (obv. 3) may be formed from the stem *balava-*, or else *t* is erroneously written single; in *arhacittam* (obv. 3) we may probably have an *-a* stem (cf. Mahāvastu *araho*). Of the word *bhagavant* we have the vocative *bhagavā* (obv. 4. 10), and also, it appears, *bhagavān* (rev. 1, and probably 2).

A confusion between masculine and neuter forms in nom. sing. occurs in pronouns referring to *cittam*: *yaś ca . . . cittam* (obv. 3) *yaś cittam sa* (rev. 3); *yo* at the end of obv. 3 probably also refers to *cittam* (obv. 4); *katamas ta bho balavatara cittam* (obv. 3; *balavatara* can stand both for msc. and ntr.). But obv. 6: *kataram cittam*.

Confusion of the genders, esp. msc. and ntr., is not uncommon in Buddhist »mixed« Sanskrit; cf., e. g., Saddh. P., p. 24⁴: *kṣetra kecit*.

Such verbal forms as the passive *ākhyāyati* (obv. 6. 7), and *abhibhavitvā* (rev. 5) may, of course, be met with in almost any Buddhist text.

For *paryādīyeta* see below, note². Of the same verb we have several times the infinitive *paryādayitum* with *śakyate* (obv. 5) and *śakya(m)* (rev. 7. 8. 9); another infinitive is *paryādīyanāya* (obv. 10), governed by *śaknoti*, with active sense. This infinitive, which appears to be formed from the passive stem *paryādīya-*, recalls the Prākritic infinitives with *-aṇa*

¹ If this is the meaning, the words *aprameyā-akṣobhinīya-mārasainya-sarāga*² should be combined into one compound.

² This form has, of course, the appearance of a passive, in which case we should expect an agent in the instrumental: *kā(ṇ)camāṇikaiḥ*.

³ Cf. Mahāvastu I, 164¹⁴: *vaṅkāvakāśā vigato*; 209¹⁸. ¹⁷: *sūryam (candram) nabhā kukṣim anupraviṣṭam*.

(Pischel, Gramm. d. Prākṛit Sprachen, § 579); *paryādīya* (obv. 7: *anāsravacittair na śakyate paryādīya*) may be wrong for *paryādīyanāya*.

The verb *paryādā* stands here several times with *cittam*, and this appears to be a much favoured connection. Childers quotes, *s. v.*, the phrase *cittam pariyādāya tiṣṭhati*, which he translates by: 'makes a deep impression on, or possesses, the heart'. The same phrase is also found in Sanskrit; I have met it in the Sūtra on giving away one's «all but last bit» (*apaścamikaḥ kavaḍaḥ*) in Avadāna Śataka No. 32 (I, p. 173 sq.) and Divyāvadāna No. 20 (p. 290 and 298): *eṣām utpannam mātsaryam cittam pariyādāya tiṣṭhati*, which M. Feer renders by: 'la tendance à l'égoïsme inné en eux se développe et persiste.' Burnouf, in his translation of the Kanakavarṇa Sūtra (Introd., p. 91.) says: 'la pensée d'égoïsme qui est née dans leur esprit y demeure certainement pour l'offusquer.'

I have rendered this verb above, p. 21 with 'surpass', 'eclipse', and in this sense it also occurs Saddh: P. p. 200: *nānyaḥ śaktaḥ Pūrnam Maitrāyaṇīputram arthato vā vyañjato vā paryādātum*, where Professor Kern translates: 'able to equal'. I think the governing meaning of *paryādā* is 'overpower', then 'surpass' and 'annihilate', 'bring to an end'; this last named sense appears in the substantive *paryādāna*, which in Avadāna Śataka and Divyāvadāna stands with *parikṣaya*.

Orthographic peculiarities are: *d* stands for *dh*: *madye* (rev. 4), *madyai* (obv. 8); *parisodyā* (obv. 9); *ai* for *e*: *madyai*, and *aiva* (rev. 9). Final *r* is omitted in *vigatarāgai viga°* (obv. 5), and °*samai lokadhātubhiḥ* (rev. 10); after *r*, consonants are not doubled, except three times in the frequently occurring word *avaivart(t)ika*. In *niryātam* (rev. 2) which I take to be gen. pl., the short *a* may be a Prākṛitism.

Initial *ś* twice appears as *cch* after a word ending in a vowel: *cchāradvātīputra* (obv. 6) and *cchoṣayitum* (rev. 9)¹.

The following words deserve special notice:

akṣobhiṇyo (obv. 1), °*nya* (obv. 5), both times in connection with *mārasainya*. In Lal: Vist., p. 151⁴, *akṣobhiṇī* is the name of a number; it is preceded by the following numerals. *koṭī*, *ayuta*, *nayuta*, *niyuta*, *kaṅkara*, and *bimbara*, and occupies here the same place as the far more usual *akṣobhya* Lal. Vist. p. 147 (where *vivara* stands for *bimbara*), and the almost identical list Mahāvvy. 248, and should, therefore, represent the number 10¹⁹. Pāli *akkhohiṇī*, according to Childers, stands for 10,000,000⁶, or 10⁴². Lal. Vist. 342¹, *akṣobhya* occurs with *mārasenā*: *sā mārasena vipulā mahatī akṣobhyā*, and M. Foucaux renders it here with «inébranlable». In Mahāvastu, II, 104¹², *akṣauhinyo* appears, as M. Sénart thinks, in the acceptance of army.

parisodhi (obv. 9; erroneously written *parisodi*) I have translated with 'lustre'. With the verb *parisudh* and its derivatives the meanings of purity, purification, investigation, are generally associated. A meaning such as clearness or brightness of vision must be attached to *māmsa-*, *divya-*, *prajñā-*, and *dharmacakṣuṣparisuddhi* (Śatas. Pr., p. 290 sqq.), and *parisuddham buddhacakṣuḥ* (*ibid.*, p. 300). As for its formation, *parisodhi* may be compared with *bodhi*.

¹ Cf. the writing *ts* for *s* in Fragment 7 (p. 13).

gotragavo (rev. 2). I suggest above (p. 29) the meaning leader: the 'bull of the gotra'(?)
saryathā (rev. 3) is a typical Prākṛitism for *tadyathā*; Mahāvastu has frequently *saryathā*
(see Index). Another Prākṛitism is *ho* (rev. 9: *śakṣyanti ho puna*), which stands either for *bho*
(cf. *na śakya bhoḥ puna*, rev. 7) or *kho* (cf. *śakṣyanti khalu punaḥ*, rev. 8).

Fragment 10. (Plate I). A small piece, 2 in. in length, and 4 ½ in height. Paper rather thick, uneven texture, no waterlines. Left-hand edge preserved, as well as the top (or bottom) edge. The script is of the «cursive» Gupta type, and the characters are on one side, here marked (A), considerably larger and stand more widely apart than on side (B).

This sort of writing is admittedly difficult to read, and in the case of so small a fragment the difficulty is increased, since it is impossible to make out the peculiarities of the scribe's handwriting. Though I confess my inability to decipher all signs of this fragment, and am exceedingly doubtful about the reading of others that I have attempted to decipher, I think it may be stated that the fragment is bilingual, containing words in Sanskrit as well as such in the «Khotanese» tongue¹.

I discuss the reading of the fragment below, line by line: —

(A). 1. 1. *yau laukasya*.

1. 2. *rraṃ pu tsai pūṇa*. I am not at all sure about the reading of the first three signs; the two first ones seem to form a ligature, in which case I am at a loss to decipher it. But they may also be two separate akṣaras squeezed together, in which case the second sign would be *pu* and the first resembles that *r* peculiar to the «Khotanese», which Dr. Hoernle transcribes *ra*, and Professor Leumann *rra*. — The word *pūṇa* I think is quite plain: it is Sanskrit *puṇya* which, when borrowed into Khotanese, becomes *pūṇa*, or *puṇa* (see Fragment 11). This line would then be in Khotanese.

1. 3. *derakṣasarva*; Sanskrit.

1. 4. *kālyacī*. I am doubtful about the reading of the first and last akṣara.

1. 5. *haḍā*. Here we have a typical Khotanese word.

(B). 1. 1. *lī hue* (or *hvi*). The first sign has a great resemblance to the numeral 60², but more probably it is a slovenly written *lī*,³ *hue*, of course, is a good Khotanese word.

1. 2. *yau prrā ṣṭī*

1. 3. *nī yau aṃ jasta*

1. 4. *karaṇīya* . .

1. 5. *ṣī* (? or *ṣī*) *cīkaraṇī*; above and below the line, in front of *ṇī*, there are marks the meaning of which I am unable to understand.

1. 6. In this line I can make out with certainty the last signs only, which give the Sanskrit word *puṇya*; the signs preceding it appear to be *ntara*, but the other ones are open to various conjectures.

1. 7. *kṣī ja* (? or *nta*) *dā* (? or *vā*?) *kṣaṇī*.

¹ In deciphering the fragment I have had the advantage of valuable suggestions from Dr. HOERNLE.

² See, for instance, HOERNLE, *l. c.* p. 455 (Fig. I), and Plate I line 6.

³ See *l. c.* Plate IV, l. 4, and especially Plate VI, fol. 8 obv., l. 1 in the word *samlīpa*.

Fragment 11. (Plates VIII and IX). Yellow-brown paper, fairly even texture, indistinct transversal waterlines, $9\frac{3}{4}$ by $3\frac{1}{2}$ in., string-hole $4\frac{1}{4}$ in. from left-hand edge. A considerable portion torn off from right-hand side. On the left-hand margin on obverse there is a numeral, of which the last figure only, 3, can be read. Six lines to the page.

The writing is in the 'upright', angular Gupta, and very similar to that of fragment 9, as well as to the Godfrey MSS., described by Dr. HOERNLE¹. The leafs reproduced in Sir AUREL STEIN's Ancient Khotan, Plate CXI, are of the same type.

Like these last mentioned MSS., the present fragment is written in the 'Khotanese' (or 'Khotanī') language, the 'Nord-arisch' of Professor Leumann, or, in the opinion of the Berlin savants, the Śaka language².

Obverse.

1. ttīyā³ bhaiṣṣajasenā bodhisatvā tta hve sā pulsumā gyasta-ba[lysa]
2. gyastā-balysā tta hve rre ṣvā ru ṣṭe bhaiṣṣajasena mama sā pulsumā(?) bhaiṣṣajasenā bodhisatvā tta hve sā pu-]
3. lsumā gyasta-balysa pulsumā māḍāna gyasta-balysa [bhai-]
4. ṣṣajasena tta naḍau nā narī rauravā māstā-narī ā ta
5. nā ttavanā māstā-narī ā ta u mā tya vā lai aviśā mās[t]ā [narī bhaiṣṣajasenā bo-]
6. disatvā tta hve sā anārrā gyasta-balysa nadā ysamra [gyastā balysā]

Reverse.

1. tta hve sā anarrā bhaiṣṣajasena naḍe ttāvatriśvo gya[s]t
2. ve kāḍāna gyasta-balysa· u cu pracai ṣā naḍa ttāvatriśvo [bhai]
3. ṣṣajasena ṣā naḍe maraṇu vāte gyastānu gyasta-ba
4. ḍe· ttyā puṇyau bhaiṣṣajasena ṣā naḍe kṣaṣṭā kalpa-va[ṣṭa]
5. u haṣṭā kalpa-vaṣṭa jātā-smarā hāmāte· u ysātānai bi[ṣṣā dukha ha-]
6. rbiṣṣā dukha nā ṣe me u sarvasatva ne hautāre biṣṣā dukha nā ṣe

Bhaiṣṣajasena is not one of the more common bodhisatva names; it is rarely met with in Sanskrit texts, but his name is found in one of the few Khotanese fragments that have hitherto been published: in the MS. of the STEIN collection marked E. I. 7, fol. 149.⁴ Our fragment cannot, however, have formed part of that MS.: the width of the leaves, the position of the string-holes, and the number of lines on the page are different. Also, it is hardly part of another MS. of the same text, to judge from the peculiarities of the language. Both texts belong to the older type of the literary Khotanese idiom, what Professor LEU-

¹ JASB Vol. LXVI, Pt. I, No. 4, 1897, p. 227 sqq., and Plates VIII—X.

² H. LÜDERS, Die Śakas und die 'Nordarische' Sprache. *Sitzungsber. d. Königl. Preuss. Ak. d. Wiss.*, 1913, No. XXIII; Über die literarischen Funde von Ostturkistan. *Ibid.*, 1914, pp. 93 sqq. (9 sqq. of reprint).

³ I transcribe, as Professor LEUMANN (see Zur Nordarischen Sprache und Literatur, p. 38 sq.), *tt*, though the MS. appears to have *nt*; in this angular script, *t* and *n* are kept well distinct, but in compound letters, *t* acquires the appearance of *n*; thus, in fragment 9, *citta* looks like *cinta*, *utpadyate* like *unṣā*^o, etc.; similarly, in the Godfrey MSS, leaf XI (Plate VIII in JASB, LXVI, Pt. I, No. 4) the *t* in *ratnaśrī*, *ratnagarbhe*, looks like an *n*.

⁴ Ancient Khotan, Plate CXI.

MANN calls the Sūtra-Sprache ¹, as shown by the spelling *gyasta-balysa* (in later texts *jasta-baysa*), the gen. pl. in *-ānu*, the nom. sg. ntr. *marānu*, etc. But in the Mannerheim fragment the sibilant is doubled in *Bhaiṣṣajasena* (in the STEIN MS. *Bhaiṣa*^o, or *Bhaiṣa*^o) and in *biśśā* (in the STEIN MS. *bāśā* or *biśā*). Another difference lies in the little word *sā*, which is used so frequently in introducing an utterance after *hve* or *hvate*²; in the STEIN MS. it is invariably written *se*.

The fragment abounds in Sanskrit loan words. Amongst them are three names of hells: *rauravā*, *ttavanā*, and *avīśā*, each of them styled 'Great-hell', (*māstā narī*). The last mentioned is interesting as an additional example of the change of Sanskrit *c* into *ś*, and it confirms Professor LEUMANN's etymology of *āśirī* from *ācārya* or *ācariya*³; cf. also *vāśe* (Nordarisch, p. 89^b), *vāśī*, *vāśīti* (*ibid.*, p. 93³⁰; 134¹²), derived from Sanskrit *vāc*.

In *puṇyau* we have instr. pl. of *puṇa* (cf. LEUMANN, Nordarisch, p. 99^{b-15}; 112¹¹), which occurs in fragment 10 written *pūṇa*, just as *dukha* is found with long *ū* in the piece of Suvarṇa-prabhāsa, published by M. PELLIOU⁴ (fol. 61 obv. 2); for *jātā-smarā* we have in Suv. pr. (fol. 62 obv. 3) *jā-smara* (nom. pl.).

pracai (rev. 2) seems to be acc. sg., to judge from the preceding relative pronoun *cu*, and would correspond to Sanskrit *yaṃ pratyayam*; cf. the acc. *samai* and *vinai* (LEUMANN Nordar., p. 66). The instr. sg. *pracaina* is noted by Professor LEUMANN (*l. c.* p. 66).

ttāvatrīśvo (rev. 1 and 2) is loc. pl. of *ttāvatrīśā* = 'trāyastriṃśa god'⁵.

Among native Khotanese, or at least non-Sanskritic words, we note, at first, two numerals: *kṣaṣṭā* and *haṣṭā* (rev. 4. 5.) both in connection with *kalpa-vaṣṭa*; *kṣaṣṭā*, of course, is 'sixty'; as for *haṣṭā*, I am not sure whether it stands for 'eight' or for 'eighty'. The Khotanese word for 'eight' is *haṣṭa*⁶, and for 'eighty', Professor LEUMANN gives the word *haṣṭātā*. I am inclined to believe that *haṣṭā* means 'eighty', on account of the long final *-ā*. The length of Aryan final *ā* does not seem to be retained in Khotanese. Nom. sg. of fem. *ā*-stems end in *-ā*, both in Sanskrit loan words, as *tṛṣṇa* (LEUMANN, Nordar. 21²¹⁻²⁴) *saṃnā* (*ibid.*, 80²⁶⁻³¹⁻³⁴: *Vajracchedikā*), and in native words (Reichelt, *l. c.*, p. 33). Where final *ā* occurs, either a consonant, it appears, has dropped out from the end, as in *biśā*, nom. and acc. sg. of *biśān* (Nordar., p. 127²⁹), or in the gen. pl. in *-ā*, being an abbreviated form for *-ānu*, *-ānā*, *-āṃ* (Reichelt, *l. c.*, p. 33), or else *ā* is produced by contraction of two vowels, after the dropping of an intermediate consonant, generally *k*, as in nom. sg. and pl. fem. *śśandā* (according to Professor LEUMANN, *l. c.*, p. 135³⁸ from **śyantakā*), or the nom. pl. msc. of the *dātīnā* type. In *vaśārāmā*, *vaśrāmā* = Skr. *vajramaya* (*l. c.* p. 133³⁹), *y* has dropped out, and a *t* in *dā* (Suv. pr. fol. 59, rev. 4; 62, obv. 1), acc. sg. of *dāta* (the full form is *dātu*, or,

¹ Nordarisch, p. 58.

² Cf. PELLIOU, *Mémoires de la Soc. d. Lingu.* Tome 18, 1913. p. 117. LEUMANN, Nordarisch, p. 75¹⁸.

³ Nordarisch, p. 68.

⁴ *Mémoires de la Soc. d. Lingu.* T. 18, 1913 pp. 89 sqq.

⁵ See Index of words in 'Fragments of a Buddhist Work in the Ancient Aryan Language of Chinese Turkistan', ed. by STEN KONOW (Mem. As. Soc. of Bengal, Vol. V, No. 2, 1914).

⁶ *l. c.* p. 136; 47. REICHELT, *l. c.* p. 30.

⁷ HOERNLE, JASB Vol. LXX. Pt. I Extra No 1., 1900, p. 34 LEUMANN, Nordarisch, p. 140.

in younger texts, *dātā*) and in *jā-smara*, quoted above.¹ Just as *dātā*, *jātā* give *dā*, *jā*, so also *haṣṭātā* may produce a short form *haṣṭā*.

Another word for 'eighty' appears to occur in one of the Stein fragments, D. III, 1, p. 8 (Ancient Khotan, Plate CX; in LEUMANN's Nordarisch described as S¹ 8) where we have, in the beginning: *u ṣṭātā ysāre kalpa-vaṣṭa*, and, a little later on: *u satā ysāre kalpa-vaṣṭa*, 'through eighty (resp. hundred) thousand kalpas'.²

In the first half of our fragment we find the word *pulsumā* repeated several times, forming part of the utterances of the bodhisatva Bhaiṣajāsena as well as of the Buddha. It is, of course, connected with the verb *puls*, Skr. *pr̥ccha* (LEUMANN, Nordarisch p. 123²⁰), and may be a nominal derivative from it. A similar position is occupied in the second half by the word *anarrā*.

Of a word *naḍ-* three different forms occur: *naḍā*, *naḍe*, and *naḍau*. The first form stands immediately after the vocative *gyasta-balysa* (obv. 6), and is once (rev. 2) preceded by the pronoun *ṣā*. After the vocative *bhaiṣajāsena*, *naḍe* stands once (rev. 1), and *ṣā naḍe* twice (rev. 3, 4), and once *tta* (or perhaps: *ttu*) *naḍau*; *naḍā* appears to be nom. sg. of a participle in *-ta*, *naḍe* again nom. sg. of a participle in *-tānd* (LEUMANN, Nordar., p. 115); *naḍau* may either be acc. sg. of a form augmented by a suffix *-ka*, or else have arisen from *naḍe u* (*l. c.*, p. 108, *s. v.* 2. u).

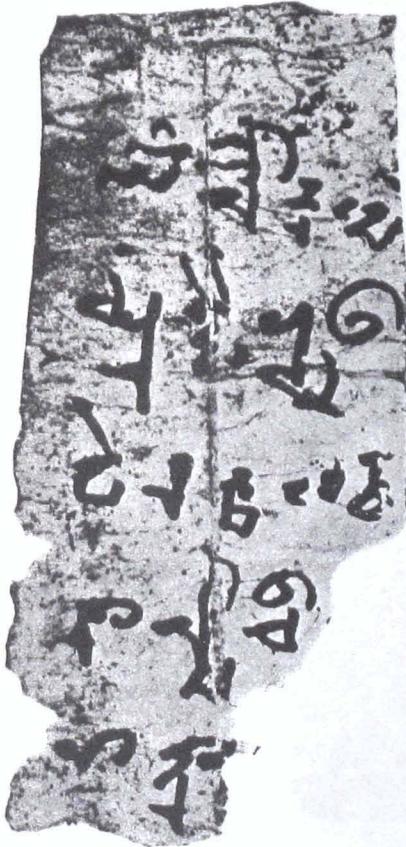
¹ Long final *ā*, however, seems to be retained in the ending of loc. pl. *-vā* (also *-vo*).

² I do not think *ṣṭātā* here has any connection with the forms beginning with *ṣṭā* which occur frequently in Khotanese texts, and evidently are derived from the root *stā*, such as *ṣṭāte* (LEUMANN Nordar. 95²), *ṣṭāna* (*ibid.*, 88²⁴; 89¹ [by LEUMANN rendered by 'santi']; 89⁷⁻¹¹; 99¹; 134¹³), *ṣṭāṃde*. Suv. pr. fol. 62 obv. 2 = *tiṣṭhanta*), *ṣṭāre* (PELLIOT, *l. c.* p. 106; 'ils sont').

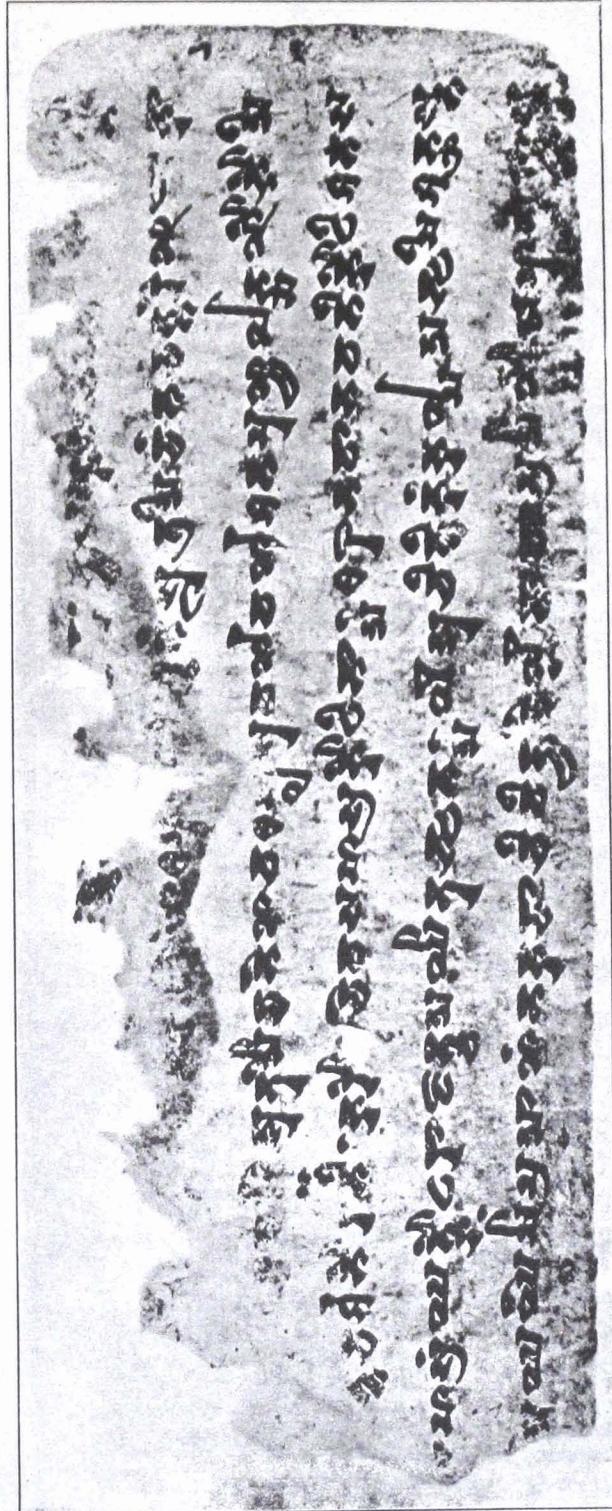
PLATE I.



Fragment 1 (A) & (B).



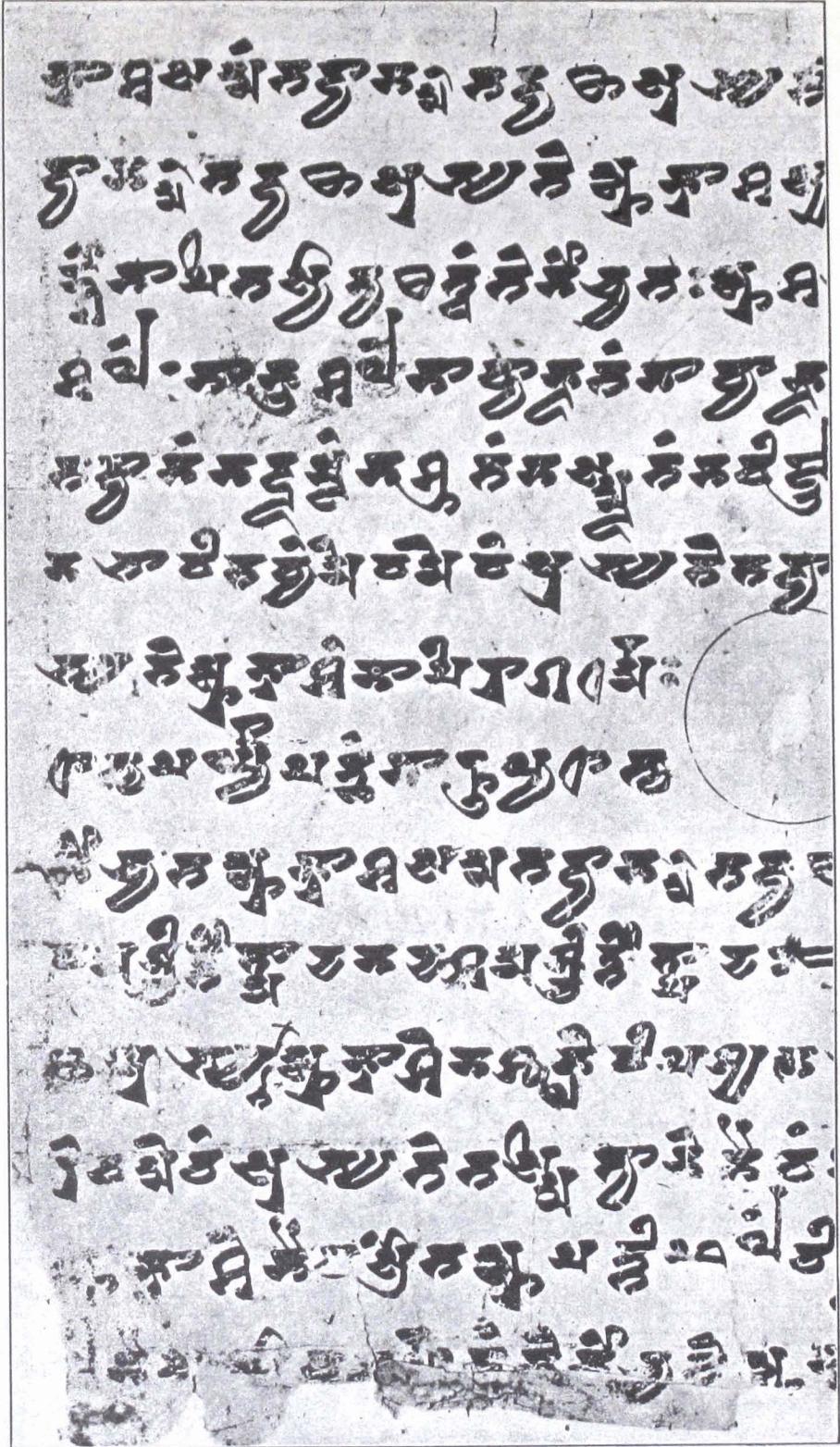
Fragment 10 (A) & (B).



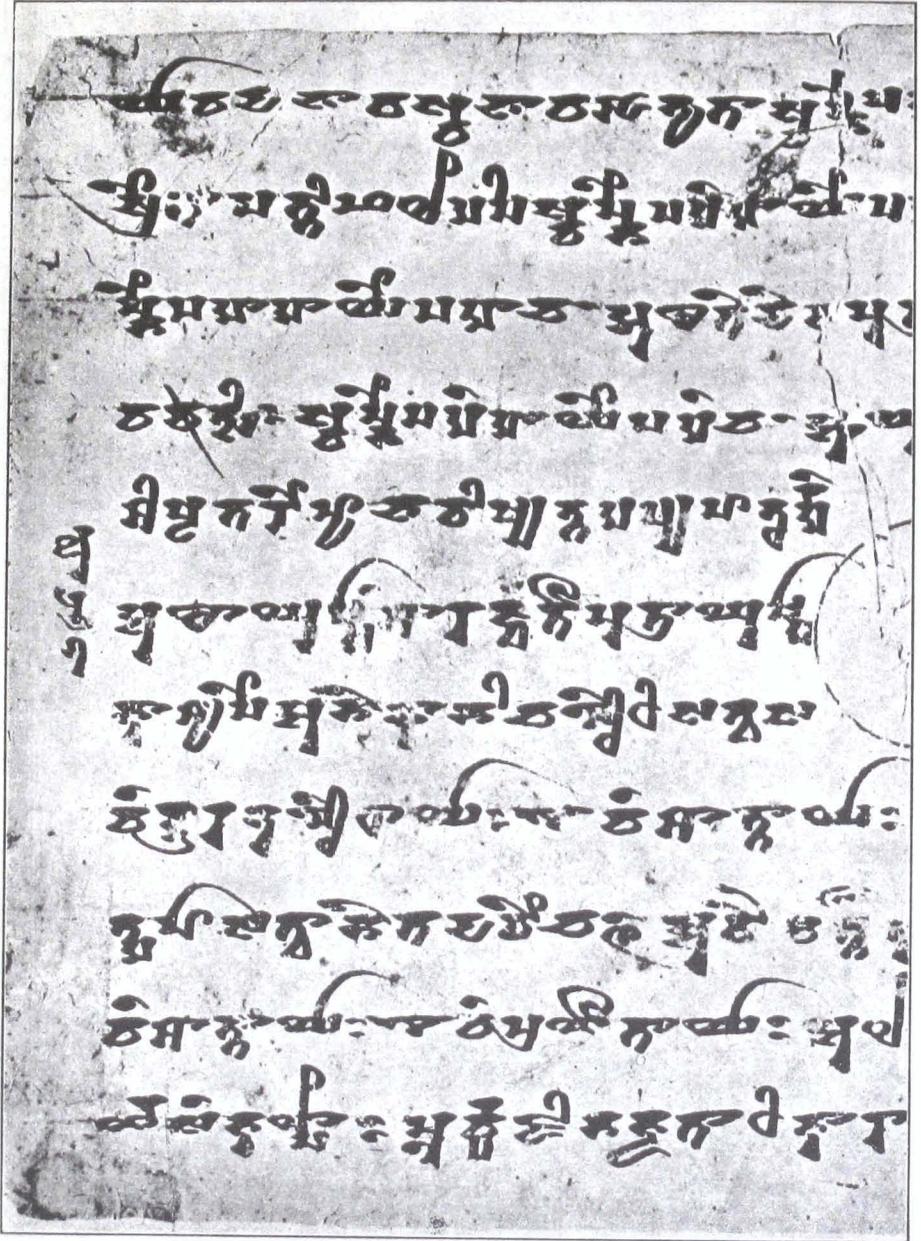
Fragment 6. Obverse.



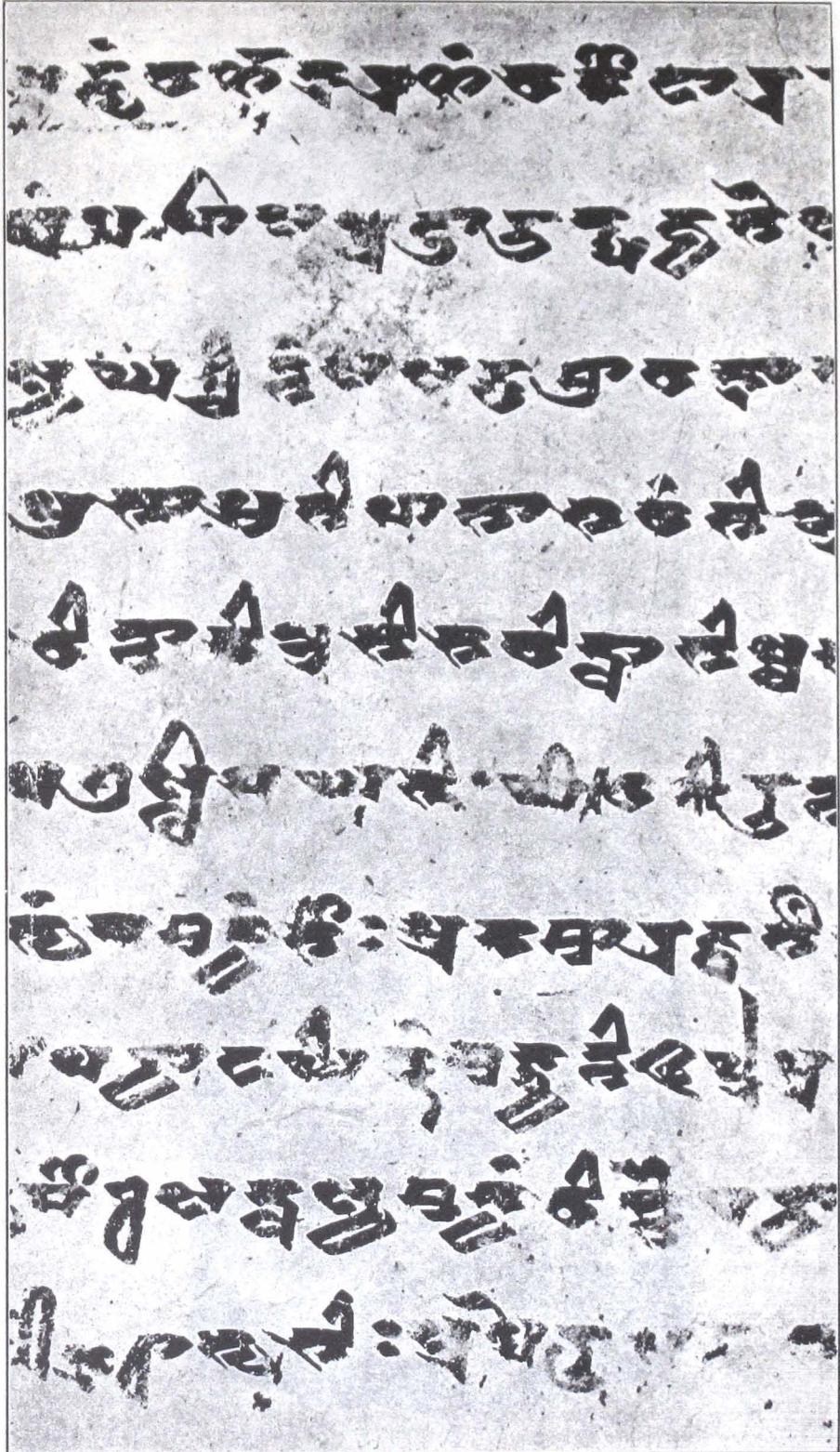
Fragment 6. Reverse.



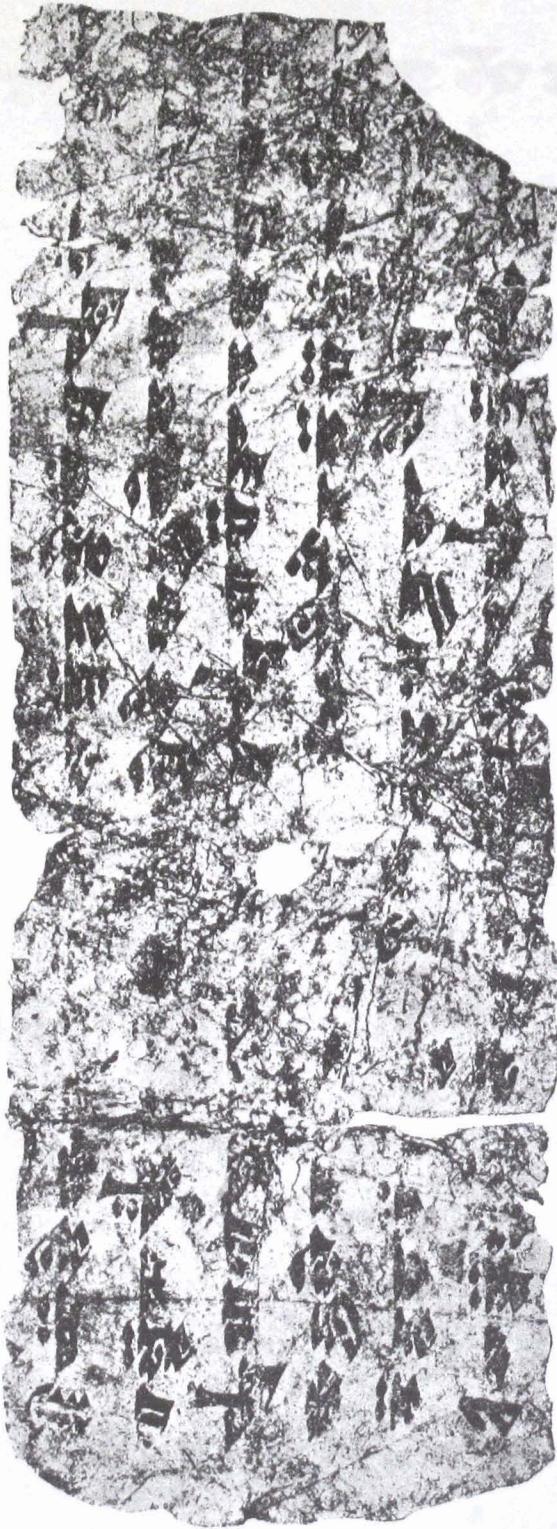
Specimen of Fragment 7. Reverse. Size slightly reduced.



Specimen of Fragment 8. Obverse.
Size slightly reduced.

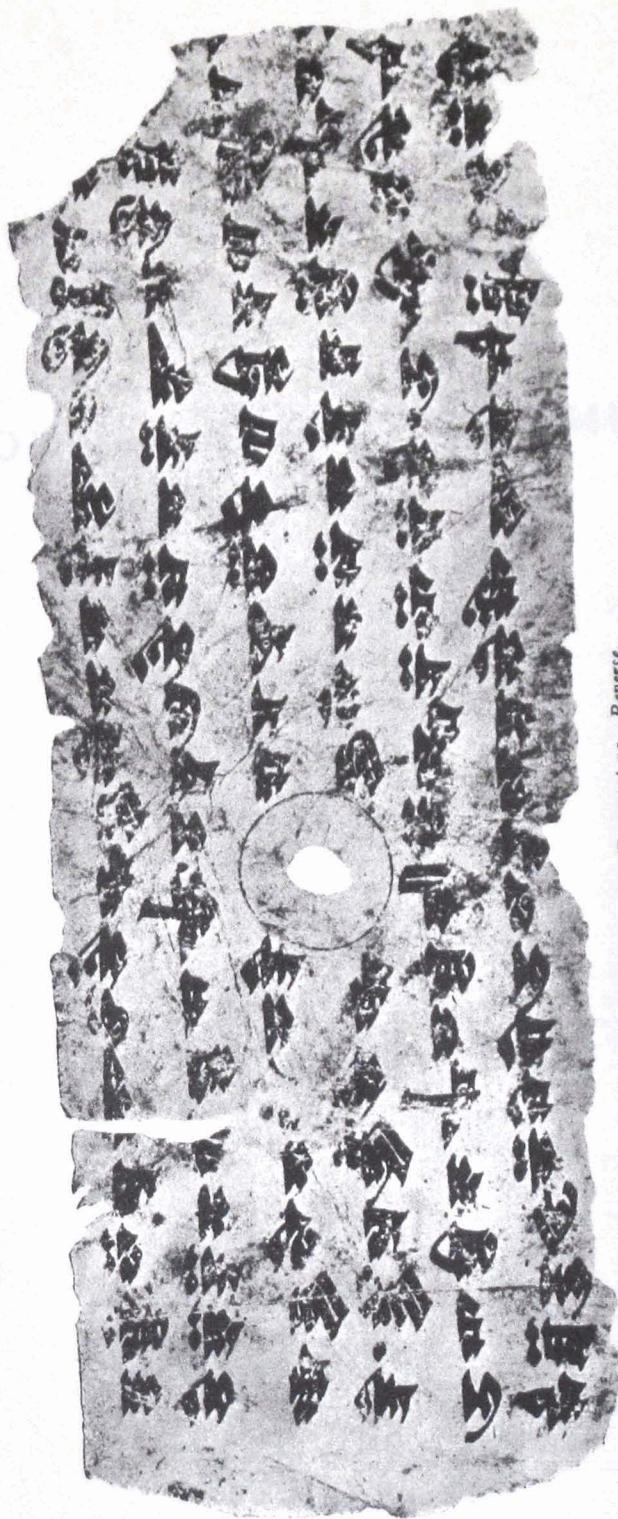


Specimen of Fragment 9. Reverse.



Fragment 11. Obverse. Size reduced.

PLATE IX.



Fragment 11. Reverse.

FOUR UIGURIAN DOCUMENTS

BY

G. J. RAMSTEDT

Amongst the many valuable objects that Fieldmarshal Baron G. MANNERHEIM brought with him from East Turkestan there are four business documents in the Uigurian language and characters. They are now published for the first time.

Writings of this kind seem to have been very common among the Uigurians of the X—XIVth centuries. The *Uigur* nation lived in East Turkestan for the greater part in towns and oases along both sides of the Tian-Shan mountains and developed a fairly high civilisation in this part of Central Asia. They were accustomed to draw up in writ all kinds of business transactions and also liabilities of various kinds. Many such contracts and deeds of purchase have already been found in and near the present town of Turfan. A collection of such papers was prepared and translated by the Russian academician W. RADLOFF and was after his death continued and published by S. MALOV under the title »Uigurische Sprachdenkmäler«, Leningrad 1928.

The four documents now published are given in photographic reproduction, in transcribed text — so far as this is still legible — and in an English translation, which, however, on account of the structural difference of the languages, is somewhat free, in order that the sense may be understood more easily.

I.

The first part of the
 document is a letter from
 the Secretary of the
 Board of Directors to
 the Board of Directors
 dated 1900. The letter
 is addressed to the
 Board of Directors and
 is signed by the
 Secretary of the Board
 of Directors. The letter
 is dated 1900 and is
 signed by the Secretary
 of the Board of Directors.

TRANSCRIPTION

I.

taqigu jil jitinč aj sekiz j'girmike mn
 tojinčooq tüšike bansij biz üčegü edi üč(?)
 čoqi bolmiš-qa tugmiš-imiz edgü tonga tardu
 öz qana öz-kinte tišip. bu kün-te
 öngdün-ki tüšike-ning tangut-ta qitaj-
 ta negü j'me birimi bar erser tojinčooq bansij
 bilmez mn tüšike bilir mn. bu kün-te
 kin negü j'me qalan barsiz bolsar üčegü
 qal^animiz ülešip birir biz: t^anuq jabiči
 t^anuq abiri. bu tamga tüšike-ning ol. mn
 öz qana-tu ajitip bitidim.

TRANSLATION

In the hen-year, the seventh month, the eighteenth day, I, Tojinčok, Tüšike and Bansei, we three, since the property has been three(?) parts(?), have, in the presence of our relatives Edgü-Tonga, Tardu and Öz-Kana, mutually consented (as follows): from this day forwards, if Tüšike has in Tangut or in Kitai any kinds of debts, Tojinčok and Bansei are not responsible, (only) I, Tüšike, am responsible (»I know it«); from this day onwards, if any amount of tax money will be not existing, we all three shall pay dividing it on our taxes. Witness: Yabiči, witness: Abiri. This seal is Tüšike's. I, Öz-Kana, have written according to dictation.

The first part of the paper is devoted to a study of the
 properties of the function $f(x)$ defined by the equation
 $f(x) = \int_0^x f(t) dt$. It is shown that $f(x)$ is a
 constant function. The second part of the paper is devoted
 to a study of the function $g(x)$ defined by the equation
 $g(x) = \int_0^x g(t) dt$. It is shown that $g(x)$ is a
 constant function. The third part of the paper is devoted
 to a study of the function $h(x)$ defined by the equation
 $h(x) = \int_0^x h(t) dt$. It is shown that $h(x)$ is a
 constant function. The fourth part of the paper is devoted
 to a study of the function $k(x)$ defined by the equation
 $k(x) = \int_0^x k(t) dt$. It is shown that $k(x)$ is a
 constant function. The fifth part of the paper is devoted
 to a study of the function $l(x)$ defined by the equation
 $l(x) = \int_0^x l(t) dt$. It is shown that $l(x)$ is a
 constant function. The sixth part of the paper is devoted
 to a study of the function $m(x)$ defined by the equation
 $m(x) = \int_0^x m(t) dt$. It is shown that $m(x)$ is a
 constant function. The seventh part of the paper is devoted
 to a study of the function $n(x)$ defined by the equation
 $n(x) = \int_0^x n(t) dt$. It is shown that $n(x)$ is a
 constant function. The eighth part of the paper is devoted
 to a study of the function $o(x)$ defined by the equation
 $o(x) = \int_0^x o(t) dt$. It is shown that $o(x)$ is a
 constant function. The ninth part of the paper is devoted
 to a study of the function $p(x)$ defined by the equation
 $p(x) = \int_0^x p(t) dt$. It is shown that $p(x)$ is a
 constant function. The tenth part of the paper is devoted
 to a study of the function $q(x)$ defined by the equation
 $q(x) = \int_0^x q(t) dt$. It is shown that $q(x)$ is a
 constant function.

Original size 10.5 X 27 cm.

II.

TRANSCRIPTION

taqigu jil üçünç aj iki jangiqa m'n
 köni-quz agir igke tegip ölüp idip
 bargai mn tip singüi tojinčoq beg-ke
 küdegüm like-ge kingešip ajitišip
 kengsi-de tugmiš buqa quli atlig
 ogul-in-qa ögke qangqa bujan-i
 tegs-ün tip boš bitig birtim.
 bu künte minçe buqa quli-ning t
 örü tag-qa qodı quum-qa birser
 öz köngül-inçe bujan birip joris-un
 mening qatin-larım tirige-İtmiš a bašlap
 v tegi qatin-larım mening tugmiš-larım
 kim jime čamlamasun-lar, čamlasar-lar
 ičgerü agiliq-qa bir altun jastuq
 qočo beginge bir at baŋiq beginge bir
 ud birip agir qijin-ga tegs-ün. tanuq
 tört mačarač tengri-ler tanuq jiti eke baldiz
 tengrim-ler jongquqi. tanuq ikiči tanuq aj tonga.
 bu bitig-ni agasi bugsa qujaq özkinte
 qatin-larım-qa ajitip birtim. bu tamga mn
 like-ning ol. men qaisin-tu ajitip bitidim.

TRANSLATION

Hen-year, third month, second (day of) new (moon). I, Köni-kuz, having fallen in heavy illness and thinking that I may die (of this) suffering, have, after consulting and discussing with Singüi Tojinčok Beg and with my son-in-law Like, issued this free letter for his (Like's) own son, Buka Kuli by name, (so) that its benefaction shall reach him and mother and father. From this day onwards Buka Kuli shall, just like I myself, give and live as he himself likes, whether he gives upwards to the mountains or downwards to the sands. My housefolks, all and together, beginning with A and ending with W, my housefolks and my blood-relations, whosoever it may be, they may not complain. If any one of them complains, he shall give to the Inner Treasury a yastuk of gold, to the beg of Kocho a horse and to the beg of the town an ox and may pay a heavy penalty. Witnesses: the four Maharāja gods, witness: the curse of the seven goddesses the Eke's, their sisters-in-law. Witness: Ikichi, witness: Ai Tonga. This letter I have given, in the presence of his elder brother — Buksa Kuyak — after having it read to my housefolks. This seal is mine, Like's. I, Kaisin-tu, have written according to dictation.

III.

TRANSCRIPTION

jont jil törtünč aj sekiz j'girmike
 biz jeng-ke m(a)usi edgü bir ogul-qa
 biz ikegü-ke jonglaglig kümüş kerçek
 bolup ügüz ičindeki ađgu ölung-
 ni tojinčöq-qa toquz s'dir kümüş-ke
 sibil qasar özkın-te tugru tumludu satdim.
 bu jir-ning sičisi öngdün jingaq sičisi
 ügen adırar kündün jingaq sičisi
 tojinčöq-ning ačmiš jir adırar kidin
 jingaq sičisi ügen adırar tag-din
 jingaq sičisi sai adırar bu tört
 siči ičinteki jir-ke ming jil tümen
 kün-ke tegi tojinčöq erklig bols-un.
 taplasar öz-i tuts-un taplamasar
 adın kiši-ge ötkürü satsun. biz
 ikegü-ning inimiz ičimiz qamiz qadaš-
 imiz čamlamas-un. kim če erklig bek
 iši küčün tutup čamlasar bu-oq
 jir tenglig iki jir birip alsun-
 lar julsun-lar. julguči qorlug bols-un
 tojinčöq qorsuz bols-un. tanuq küreng
 tanuq tatar tanuq kičen(?). bu tamga biz
 ikegü-ning ol mn tasig-tong inčke
 ajitip bitidim.

TRANSLATION

In the horse-year, the fourth month, the eighteenth day. When we, Jeng and Mausi-Edgü, only son, when we two needed current silver, we sold an inside of the river(arms) located cultivable meadow to Tojin-čök for nine sidir of silver once for all, in the presence of Sibil Kasar. The boundaries of this land: its boundary on the front side (= from the East) — the riverarm divides, its boundary on the sun side (= from the South) — Tojin-čök's cultivated land divides, its boundary on the rear side (= from the West) — the riverarm divides, its boundary against the North — the sand bank divides. To the land between these four boundaries shall until thousand years and ten thousand days Tojin-čök be the rightful possessor. If he so desires, he may keep it himself, if he does not desire it, he may sell it further to some other person. Both of us — our elder and younger brothers, our families and kinsmen may not dispute this; whosoever tries by using force to dispute this lawful and valid dealing, he must give two fields of the value and size of this field and so may they take and dispossess. The dispossessor shall suffer the losses and Tojin-čök shall not. Witness: Küreng, witness: Tatar, witness: Kičen. This seal is ours, we two. I, Tasig-Tong, have written according to exact dictation.

IV.

The first thing I noticed
 when I stepped out of the plane
 was the fresh air. It felt like
 I had been in a cocoon for
 hours. The sun was shining
 brightly, and the birds were
 chirping. I took a deep breath
 and felt a sense of freedom.
 I had finally reached my
 destination. The road ahead
 was long, but I was ready.
 I had a map and a compass.
 I had a backpack full of supplies.
 I had a sense of adventure.
 I had a sense of purpose.
 I had a sense of direction.
 I had a sense of hope.
 I had a sense of faith.
 I had a sense of love.
 I had a sense of life.

NOTE

As there is no seal on this contract and it is not even stated that the money has been received in full by the seller, one is allowed to conclude that this sale of land may have been for some reason retracted or rejected.

TRANSCRIPTION

IV.

aj tong-a din bir jⁱgⁱrmi sⁱdir biš baqir
 tegdi. adaj da üç sⁱdir jiti baqir
 tegdi. telgüi din iki jⁱgⁱrmi sⁱdir tegdi.
 toqmaq tin on sⁱdir tegdi.
 bügürek tin jiti jⁱgⁱrmi sⁱdir tegdi.
 siniri-tu din bir jⁱgⁱrmi sⁱdir biš
 baqir tegdi. tingüi-tong din bir jⁱgⁱrmi
 sⁱdir biš baqir tegdi. qaisin din
 on sⁱdir tegdi. ked-qi-a-tong din
 bir jⁱgⁱrmi sⁱdir biš baqir tegdi
 ikiçi ning bir jⁱgⁱrmi sⁱdir biš
 baqir tegdi. türen din bir jⁱgⁱrmi
 sⁱdir biš baqir t^gdi. baqu din
 sekiz sⁱdir tegdi. qiçaq ning alti sⁱdir t^gdi.
 sengü-ling din on sⁱdir kümüš t^gdi.
 sindi jiti biš baqir t^gdi.
 jana qiçaq tin bir j^arim sidir t^gdi.
 jana sindi din bir j^arim sidir t^gdi.
 jana bir sⁱd'r kümüš t^gdi.
 (On the back:)
 ontun din biš jⁱgⁱrmi sidir kümüš t^gdi.

TRANSLATION

From Ai-Tong-a eleven sidir (silver) five coppers received. From Adai three sidir seven coppers received. From Telgüi twelve sidir received. From Tokmak ten sidir received. From Bügürek seventeen sidir received. From Siniri-tu eleven sidir and five coppers received. From Tingüi-Tong eleven sidir five coppers received. From Kaisin ten sidir received. From Ked-Kia-Tong eleven sidir five coppers received. Of İkichi eleven sidir and five coppers received. From Türen eleven sidir five coppers received. From Baku eight sidir received. Kiçak's six sidir received. From Sengü-ling ten sidir in silver received. Sindi seven and five coppers received. Again from Kiçak a half sidir received. Again from Sindi a half sidir received. Again one sidir silver received.

(On the back of the paper:)

From Ondun fifteen sidir silver received.

NOTE

The last of these papers is evidently a register containing the names of different persons and the amount of money each of them had given. There is nothing written on it to show, for what purpose the money was collected; it may be that some irrigation work or other common enterprise was to be paid for.

The money unit was *sidir* (in old Mongolian *šizir*), a certain weight of silver, which after all was coined. Fifty *sidir* were equal to one *jastuk* (»pillow«), probably something like the silver shoes in China. The »small change« was *baqir* (originally »copper«), ten *baqir* equalling one *sidir*.

A FRAGMENT OF
MONGOLIAN "QUADRATIC" SCRIPT

BY

G. J. RAMSTEDT

The fragment reproduced here was either found or bought by Baron G. MANNERHEIM in 1906 somewhere in Eastern Turkestan. It is a thin, slightly creased and dust-soiled paper of Chinese manufacture and is torn from the lower corner of a sheet of a xylographed book. The script is the «quadratic» script (Phags-pa, Passepa) introduced by the Emperor Kubilai which was employed as the official script from the year 1269 to 1311 A. D., when it had to give way again to the older Uigurian script.

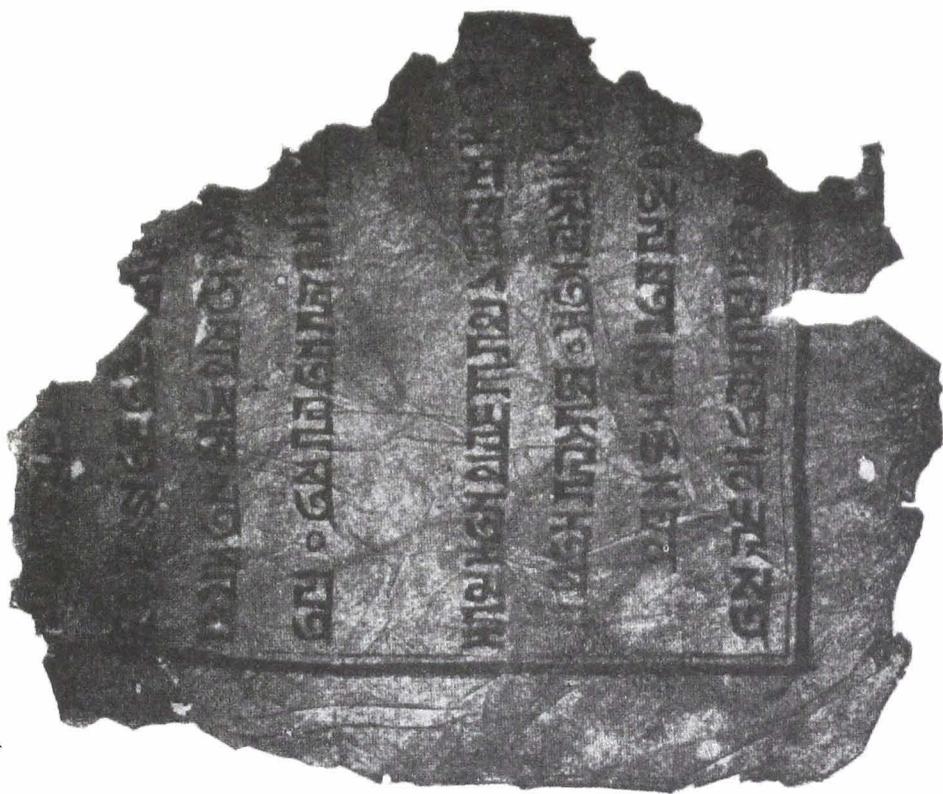
The signs for letters occurring in this fragment do not add anything new to the knowledge we already possess of the quadratic script; they are very similar to the types of letters published by POZDNEYEW (in his *Лекции по истории Монгольской литературы*, II, p. 17 sq.). For the phonetics of ancient Mongolian they contain some data worth noting, but these may be dealt with more suitably on some other occasion.

I transcribe the signs as follows:

Line 1	.....	s(a) l(a)n ö lö
» 2	.....	re q(a) q(a) lu ju h(a) s(a) qul
» 3	.....	(—)e ni u q(a)n ü lü ěi d(a)
» 4	.....	se de le du 'e su ° bu
» 5	.....	qu
» 6	.....	o sur ta qui i ne ž(a) j(a) 'n dur mer
» 7	.....	(k)i tö röl dur ° ö 'e run a
» 8	.....	(—)un ab qui dur a d(a) li
» 9	.....	i se ber qu ri j(a) 'a su

Line 1. The syllables *sa-lan* can scarcely be anything but the end of *arsalan* 'lion'; at any rate I do not know of any other word that would fit in with the following *ö-lö-* which I take to be *ölösün*, *ölösügen* or some other form of conjugation of *ölös-* the verb 'to be hungry'

Line 2. *-re* is the end of a word, possibly the converbum finale of a verb; *qaqaluju* is the future present tense (voluntative in the newer language) of *qagal-* or *qaqal-* (Buriat *χαχαl-*, Kalmuk *χαχ^{nl}-*) 'to split, to break'; *hasaqul-* is some kind of secondary



- verb to *asag-*, *asagu-* 'ask', possibly co-operatively *asagulca-* 'ask together' or factitively *asagulga-* 'let ask'.
- Line 3. Before *ni* the sign of a post-consonant *e* is visible, which I interpret as *(kelegs)eni* or *(ögülegs)eni*, i.e. the accusative of a nomen perfecti; *uqa-* is the conv. modale of *uqa-* 'understand'; *ülü* 'not'; *öida-* 'to be able', but I cannot guess what form followed.
- Line 4. *sedeledu'esu* is probably *-se deledu'esu*; *se* ? *ese* 'not', *deledu'esu* = *deledübesü* 'if or when (one, or something similar) strikes'; *bu-* is the first syllable of a word, perhaps *burugu* 'incorrect, mistaken, wrong'.
- Line 5. *-qu* probably the ending of the nomen futuri.
- Line 6. *surtaqui* nom. futuri of the passive form *surta-* of *suru*, *sur-* 'inquire, ascertain, learn'; *ine* I interpret as *ene* 'this'; *žaja'n* is a modification of *žajagan* 'fatum (also as a deity), predestined or prescribed by fate (life, happiness etc.); *mer-* should be extended into *mergen* (in Buddhistic books) 'wise, prudent'.
- Line 7. *-ki töröldür* is (*erte-* or *urida-*; or *qojitu-*)*ki töröldür* 'in (former; future) life'; *törül* 'birth, life; generation'; *ö'erun* = *öberün* 'self'; *a* the first syllable of a word, perhaps *a-bu-* 'take'.
- Line 8. *-un* with a post-consonant *u*, possibly (*ö'erun* 'self'; *adali* 'equal, similar' with preceding dative; *abquidur adali* 'similar to taking'.
- Line 9. *i-se* is a modification of *ese* 'not', as *ine* = *ene* 'this'; *ber* an emphasising enclitic; *qurja'su* (the same form as *deledu'esu*) = *qurjabasu* 'when (one) collects'.

A FRAGMENT OF MONGOLIAN "QUADRATIC" SCRIPT

In the orthography usually employed in books written in Uigurian letters, this fragment would thus look as follows (with some gaps filled in):

Line 1	.....	[ar]salan ölü[sü . . .]
» 2	.....	[. . .]re qagaluju, asagul [. . . .]
» 3	.....	[?kelegs]eni uqan ülü čida [žu?]
» 4	.....	[?e-]se deledübesü ° bu [.]
» 5	.....	[. . . .] qu
» 6	.....	o surtaqui ene žajagandur mer[gen]
» 7	.....	[?urida]ki törüldür o öberün a[.]
» 8	.....	[. . . . .]un abquidur adali
» 9	.....	ese ber qurijabasu

Although it is difficult in general to give a translation of a few words that are torn from their context, and particularly ticklish in Mongolian, a language in which the meaning of the words can only be established with certainty in a sentence, I will attempt a translation which renders the contents of this fragment as faithfully as possible:

Line 1	.....	the lion is (was) hungry
» 2	.....	broken. Asking (letting ask)
» 3	.....	not (being) able to understand (what was said)
» 4	.....	if (one) does not (?) strike; (wrongly?)
» 5	.....	(? to be)
» 6	.....	The (thing) to be learnt in this fate wise(ly)
» 7	.....	in (previous) life, self a(cquiring)
» 8	.....	to (himself, itself?) take similarly
» 9	.....	if one does not collect

I have no idea, to what Buddhistic work this fragment belongs. Lines 1—5 are probably part of a tale, concluding with a pointing of the moral of the narrative (in lines 6—9).

The high value of this small fragment lies in the evidence it gives concerning the use of the Phags-pa letters, too, in print. This fact was not known before.

METEOROLOGICAL NOTES

MADE BY C. G. MANNERHEIM DURING HIS TRAVELS
IN CENTRAL ASIA IN 1906—08

REVISED BY
RUNAR MEINANDER

During Baron MANNERHEIM's expedition to Central Asia in 1906—1908 regular meteorological observations were made and recorded in a journal. As these notes provide a record of the weather conditions during the journey in a concentrated form, and as so far we possess rather incomplete information concerning the climatic conditions of those regions and additional data are consequently of interest, a brief survey of these notes is given below.

Chapter I describes the methods of observation and the instruments used, while in chapter II the materials collected on the journey are briefly discussed and compared with earlier results from the same regions. This comparison deals principally with the general survey of the climate of Central Asia contained in J. von HANN's »Klimatologie»², the observations of HEDIN's expeditions in 1894—97 and 1899—1902 revised by EKHOLM⁹ and a summary of lengthy series of observations in Central Asia compiled by FICKER¹. The meteorological materials collected by HEDIN's later expeditions in 1927—1932 have not yet been finally tabulated and published, but it has been possible to consult some detailed investigations published by HAUDE⁴⁻⁸ and based on these materials.

I. OBSERVATIONS AND INSTRUMENTS.

Meteorological observations were made twice a day, in the morning before the expedition left its camping place and in the evening, as a rule at 6.30 a.m. and 6.30 p.m. In crossing high passes the atmospheric pressure was also calculated at other times. The records refer to August 14th to 30th, 1906, and October 8th, 1906, to July 20th, 1908. The Russian calendar is used in the present review in accordance with the published diary.

The notes were made in accordance with instructions issued in »Hints to travellers»¹⁰, a handbook drawn up by the Royal Geographical Society. As the expedition traversed a region between approximately 73° E and 117° E, its watches had to be set in the course of the journey in accordance with local time. According to the statement of the author the expedition started according to local time in Russian Turkestan, its watches probably being adjusted at Kashgar, Qulja, Urumchi, Kanchow, Lanchow and Si-an-fu. As it was

impossible to convert the time to actual solar time owing to the uncertainty in the time records, the times originally recorded in the journal are given in table No. 3 on page 17—30.

In the case of places, in which the expedition merely spent the night, only the results of an evening observation and the observation on the following morning are recorded. For the sake of clarity table No. 3 has therefore been drawn up in such a way as to place the observations at the same place on one line, i.e. the evening observation of one day and the morning observation of the next day. In addition to the place and date (Russian calendar) table No. 3 contains the following meteorological elements:

- b = atmospheric pressure in mm Hg., converted to 0° and normal gravity and applicable to the altitude of the place of observation,
- t = temperature of the air in °C,
- t_m = minimum temperature in °C during the previous night,
- t_M = maximum temperature in °C during the day,
- w = cloudiness according to a scale of 0—10,
- v = force of wind according to a scale of 0—6, and direction of wind.

The column headed »Remarks» contains other notes made during the journey in abbreviated form. Whenever it has not been possible to make an abbreviation, reference is made to a note at the foot of the page. The following accepted special meteorological signs are used in this column: ● = rain, ★ = snow, ▲ = hail, ⚡ = thunder, ☉ = sunshine. Very slight or light rain or snow is indicated by the index ° or †. These notes refer in some cases to other times than the regular hours of observation. In such cases the following abbreviations are used before the special sign: n = previous night, a = morning, d = midday, p = afternoon.

The regular observations of temperature, wind and cloudiness were discontinued from June 17th, 1908. After that date the journal only contains barometer readings and notes on the rainfall. Table No. 3 therefore ends with the morning observation on June 17th, 1908, but for the sake of completeness the notes on the rainfall are given in a supplementary table.

The following details should be mentioned regarding the meteorological elements in table No. 3.

Temperature.

The temperature of the air was determined by means of mercury thermometers of ordinary construction, which were hung up in the shade in plenty of time before making the reading. There are no precise particulars of the corrections of these thermometers. The maximum temperature was only noted in those cases, in which the expedition spent the day in the same place. Consequently the readings of the maximum temperature are much more infrequent than those of the minimum temperature. The temperature is given in the journal in °R. In order to facilitate a comparison with the work of other writers these figures have been converted into °C, and the latter scale is employed throughout the present review.

The temperature figures in table No. 3 for morning and evening have been calculated in the following manner from the original data in the journal. From the start of the journey to July 9th, 1907, notes are available concerning both the extreme thermometers, and the deviations of the readings are very slight, as a rule 0 to 0.2°. For this period the mean of these readings is given. From July 11th, 1907 the journal contains only one note concerning the temperature of the dry thermometer, this figure being included in the table as it stands. There is a note on April 5th, 1908, to the effect that the maximum and minimum thermometers had begun to indicate differently, and from that date the difference amounts to about 2° R. As it is impossible to decide after such a lapse of time, which of the thermometers had become defective, all that can be done is to take the mean of the two readings, so that after that date the temperature data must be considered uncertain.

Force of wind.

The force of the wind is given in the so-called half Beaufort scale 0—6 according to the following schedule:

- 0 Calm, smoke rises vertically, leaves of trees motionless.
- 1 Weak, to which the skin reacts sensitively, makes a flag flutter slightly, leaves rustle.
- 2 Moderate, unfurls a flag, sets leaves and small branches in motion.
- 3 Fairly strong, sets larger branches in motion.
- 4 Strong, sets thick branches and trees of small diameter in motion.
- 5 Violent, shakes all trees strongly and breaks small branches.
- 6 Gale, upsets chimneys, breaks trees and pulls them up by the roots.

Atmospheric pressure.

The expedition carried two aneroids and a hypsometer for gauging the atmospheric pressure. The aneroids were of the «Naudet» make, Nos. 39718 and 39720, referred to in the journal as No. 1 and No. 2. Before starting, the aneroids were compared with the standard barometer of the Nikolaevsky Physical Observatory in St. Petersburg, the following formulae of correction being drawn up in May, 1906:

$$\begin{aligned} \text{for No. 1} \quad b &= b_1 + a + 1.1 - 0.04t \\ \text{for No. 2} \quad b &= b_1 + a + 0.4 + 0.01t \end{aligned}$$

In these formulae b is the barometer level in mm Hg. converted to 0° C and normal gravity, b_1 the reading of the aneroid, a a term of correction dependent on the atmospheric pressure and t the temperature of the aneroid. The following figures are obtained for a , expressed in 0.1 mm Hg.

b_1	790	780	770	760	750	740	730	720	710	700	690	680	670	660
No. 1	—8	—6	—3	0	2	4	6	8	11	13	15	17	20	20
» 2	—6	—4	—2	0	3	5	8	11	13	14	16	18	20	21
b_1	650	640	630	620	610	600	590	580	570	560	550	540	530	520
No. 1	18	15	19	22	23	24	25	26	28	31	36	40	43	45
» 2	23	24	25	26	28	29	33	36	38	40	41	42	42	43

The aneroids were read with a precision of 0.1 mm, the thermometers of the hypsometer with a precision of 0.01°. Table 72 in the Smithsonian Meteorological Tables, Washington 1918, has been used for converting the latter readings into mm Hg.

As the journey occupied about two years, and as the aneroids can alter their corrections, especially if, as in this case, they are exposed to great variations of pressure, the question arises, to what extent such alterations occurred during the journey. As no results are available of subsequent control measurements, this question cannot be decided exactly. A close examination of the readings of the two aneroids noted in the journal showed, however, that No. 2 had probably altered during the journey, so that we can restrict ourselves to an examination of No. 1.

To obtain an idea of the approximate precision of the figures for the atmospheric pressure obtained in the readings of No. 1, we have compared them with some of the figures obtained in HEDIN's earlier expeditions to the same regions. The tables drawn up by EKHMOLM⁹ contain particulars of 29 places that were visited by MANNERHEIM's expedition at the corresponding time of year. If we calculate the differences (HEDIN — No. 1) between the barometer levels obtained by these two expeditions at the same place and at the same time of year, the mean of this difference is 1.4 mm, while the mean of the absolute amount of the divergences is ± 3.8 mm. No systematic alteration can be traced in No. 1 in the available materials, either in the case of decreasing atmospheric pressure or as time advances.

A comparison between the hypsometer observations and the simultaneous aneroid readings showed that the former provided figures that were slightly too low in general, and also agreed less satisfactorily with theoretically calculated figures for the atmospheric pressure.

From the comparisons made we are entitled to conclude that of the three instruments No. 1 should be considered the most reliable and that the figures obtained with this instrument only differ by about 1.4 mm on an average from the figures obtained earlier by HEDIN in similar conditions. As such a difference may be due to temporary variations in the atmospheric pressure, it is not justifiable to regard it as an indication of a fault in the instrument, and the readings of No. 1 have been included in table No. 3 converted by means of the corrections already mentioned.

II. DISCUSSION OF THE RESULTS.

General characterisation of the climate.

The extremely continental climate of Central Asia is affected to a large extent by the huge chains of mountains which bisect the continent from west to east and thus prevent the horizontal circulation of the air. The mountain massives impose vertical movements and consequent thermo-dynamic processes, and thus exercise a radical influence on the climate in these regions. In the south the Himalayas prevent the free advance of the East Indian monsoon to Central Asia, in the north and north-west the tableland of the Pamir and the Tian Shan and Altai mountains form a barrier against the entrance of the polar air coming from Siberia. The passes in the latter mountains are seldom lower than 3000 m, and Central Asia is therefore only exposed to the polar air through the Jungarian

gateway in the west, where the threshold towards Russia descends to 500 m, and across the Mongolian frontier mountains in the east which are only about 1000 m in height and thus allow the more powerful waves of cold air to enter.

The polar air flowing in through Jungaria extends through Mongolia towards the east, rounds the Tian Shan mountains and forces its way into the Tarim basin in the form of a cold NE wind. These irruptions of polar air not only cause snowstorms and «foehn» winds in the Tian Shan mountains, but also raise violent sandstorms, «karaburans», in the deserts. The occurrence of rain in the deserts of Central Asia is also essentially connected with these irruptions of polar air, and as the latter occur principally in spring and autumn, the principal rainfall in the deserts also occurs during these seasons. Winter, on the contrary, is a calm and cold season in the Tarim basin. The vertical heat convection, indeed, is responsible in summer for a greater number of rainy days, but the rainfall on the plain is very small. It is only in the mountainous districts, where the peaks rise to a height of not less than 1400 m above sea-level, that local showers and thunderstorms occur.

Further east summer rains are prevalent, caused principally by maritime sub-polar or sub-tropical masses of air coming from the Pacific Ocean. Here, therefore, a distinct monsoon influence is visible. According to HAUDE⁷ the 106° E meridian forms a clear boundary line for the climate of the Gobi. West of this meridian the climate is perceptibly drier, as is evident not only in the measurements of the rainfall, but also in the vegetation. This is due both to the increasing distance from the sea and to the orographic conditions, for the land rises in a westerly direction up to the meridian referred to, and the masses of oceanic air pressing forward from the east give up their moisture owing to the enforced ascent. Further west the land descends again and a general drying of the descending masses of air proceeds.

Calculation of averages.

A brief survey of the observations made by the MANNERHEIM expedition is given below against the background of this general description of the climate. In table No. 1 a number of mean values have been compiled that have been calculated from the data contained in table No. 3. As the figures for the atmospheric pressure are mainly of interest in connection with the barometric altitude measurements, we confine ourselves to stating the mean of the morning and evening observations. Owing to the uncertainty of the term observations of the temperature, only the maximum and minimum temperatures are included in table No. 1. As already mentioned, regular observations of the minimum temperature were made, while the maximum temperature was only recorded in those places, where the expedition remained for a whole day. In table No. 1 t'_m indicates the mean of all the observations of the minimum temperature made during the period referred to, while t_m is the mean of the observations, for which there is an immediately preceding maximum temperature record t_M . The difference $A = t_M - t_m$ indicates the fall in temperature on an average from a maximum to a subsequent minimum and therefore corresponds to the daily range of temperature. As t'_m , which is calculated from a larger quantity of data, is a safer value than t_m , an approximate value for the daily average t_1 has been calculated from t'_m according to the formula $t_1 = t'_m + 1/2 A$.

The average force of the wind v is given according to a scale of 0—6, while w is the mean of the cloudiness recorded, expressed in percentage. The mean values for these meteorological elements are given separately for the morning observations a and for the evening observations p . The height above sea-level h has been taken from EKHMOLM's work, already mentioned, and from STIELER's Handatlas 1933/35.

For those places, where the expedition stayed for some time, the respective mean values for such places have been calculated. For intermediate distances group averages have been formed. Places are designated in such a way in table No. 1 that the names of places without brackets signify that all observations at that place are included, while the name of a place in brackets means that that group only includes points of observation up to that place, but not the place itself. For instance, the designation (Yarkand) — Khotan signifies that all places are included from the first station after Yarkand up to and including Khotan.

Table 1. Mean values of meteorological elements.

Stations	Date	h m	b mmHg	Temperature °C					w %		v 0-6	
				t'm	t _m	t _M	A	t ₁	a	p	a	p
(Kashgar)-(Yarkand)	8.10-13.10	1360	650	9.9	9.1	24.9	15.8	17.8	10	26	0.6	0.4
Yarkand	17.10-31.10	1270	656	6.4	6.9	17.1	10.2	11.5	21	9	0.8	0.4
"	1.11-20.11	1270	659	0.0	0.1	8.9	8.8	4.4	55	13	0.6	0.5
(Yarkand)-Khotan	20.11-11.12	1400	648	-5.4	-6.0	6.0	12.0	0.6	28	28	0.8	1.0
Yarkand	22.12-29.12	1270	663	-10.1	-8.3	-0.9	7.4	-6.4	84	22	0.3	0.8
(Yarkand)-(Kashgar)	29.12- 3.1	1290	661	-11.0	-7.2	5.9	13.1	-4.5	25	58	0.8	0.8
Kashgar	3.1-27.1	1285	651	-7.9	-7.6	3.1	10.7	-2.5	58	55	0.9	0.4
(Kashgar)-Kelpin	27.1-14.2	1140	664	-12.2	-12.2	2.0	14.2	5.1	49	59	0.8	0.7
Uch Turfan	17.2-23.2	1400	642	-9.9	-9.7	3.1	12.8	-3.5	32	25	0.8	0.7
Aqsu	1.3-25.3	1077	662	0.3	0.9	9.9	9.0	4.8	52	16	1.0	0.7
Qulja	12.4- 4.5	660	702	5.4	4.9	19.9	15.0	12.9	41	33	0.8	0.8
Qarashahr	5.7-13.7	1090	661	15.8	17.1	29.4	12.3	21.9	25	0	0.4	0.3
Urumchi	26.7-25.8	912	678	15.4	15.6	28.3	12.7	21.7	38	51	1.6	1.5
Kucheng	4.9-18.9	700	691	8.6	8.6	24.5	16.0	16.6	51	30	1.6	1.1
Turfan	24.9-29.9	20	753	15.8	15.0	28.5	13.5	22.6	10	23	1.3	1.2
Barkul	12.10-20.10	1720	626	-4.2	-4.8	7.1	11.7	1.6	49	41	0.9	0.9
Hami	25.10-30.10	1032	694	1.4	1.4	18.5	17.1	10.0	30	0	1.0	0.8
Ansi-Ansi	9.11-22.11	1275	664	-5.9	-	-	-	-	54	50	2.2	1.6
Suchow	1.12- 9.12	1540	640	-11.1	-11.1	-0.4	10.7	-5.8	28	13	1.1	0.8
(Suchow)-Kaotai	9.12-18.12	1400	652	-7.2	-0.3	12.5	12.8	-0.8	16	33	1.0	1.0
Kanchow	18.12-24.12	1576	637	-5.3	-5.1	17.2	22.3	5.8	0	0	1.2	0.5
Kanglungsu-Kluad-												
jek gol	26.12- 2.1	2780	549	-7.0	-7.4	5.1	12.5	-0.8	4	16	0.9	0.7
Kanchow	3.1- 7.1	1576	640	-4.7	-4.2	5.4	9.6	0.1	5	0	0.5	1.5
Lianchow	14.1-22.1	1480	629	-7.2	-7.2	8.1	15.3	0.5	33	28	0.6	1.0
Lanchow	30.1-29.2	1554	630	-6.1	-6.1	3.3	9.4	-1.4	76	43	1.0	0.7
"	1.3-17.3	1554	630	-5.4	-5.5	3.9	9.4	-0.7	92	36	0.3	0.7
Labrang-Taochow	25.3- 3.4	2980	537	-1.9	-1.6	11.7	13.3	4.8	39	50	0.8	1.4
Si-an-fu	27.4-12.5	360	720	12.8	13.6	28.1	14.5	20.1	38	46	0.8	0.4
Kai-feng-fu	30.5- 5.6	130	745	22.5	23.4	35.8	12.4	28.7	25	5	1.3	1.2
Tai-yuan-fu	7.6-17.6	840	685	16.3	16.2	34.0	17.8	25.1	16	41	0.6	1.0

Temperature.

The highest temperatures recorded during the summers, in which the expedition travelled across Central Asia, were 39.8° C on July 20th, 1907, at Toqsun and 38.1° C on June 3rd, 1908, at Kai-feng-fu. The lowest temperatures during the winters were -18.0° C on February 17th, 1907, in the camp at Qizil tagh at an altitude of about 2100 m and -25.6° C on November 24th, 1907, at Pu-lung-chi. For the sake of comparison it may be mentioned that J. v. HANN² quotes the absolute extremes of -20.7° and 42.5° for the oasis of Lukchun and of -25.5° and 35.9° for Tarim-Jangiköl (40°52' N, 86°51' E and 881 m).

In his investigation into the climate of Central Asia already referred to FICKER¹ gives the mean monthly temperature of a large number of places. On the assumption that the mean values refer to the middle of different periods mentioned, we can calculate the temperature for the dates given in table No. 1 from these data by means of linear interpolation and obtain the following results:

Place	Altitude	Date	Mannerheim	Ficker
Urumchi	912	26.7 —25.8	21.7	19.8
Yarkand	1270	17.10—31.10	11.5	6.6
»	1270	1.11—20.11	4.4	1.6
»	1270	22.12—28.12	-6.4	-5.6
Kashgar	1285	3.1 —26.1	-2.5	-3.6
Tai-yuan-fu	840	7.6 —16.6	25.1	24.6

Owing to the protected situation of the Tarim basin enclosed by high mountains, the polar air only reaches this region in exceptional cases, and the winter temperature is therefore comparatively even. This is confirmed by the small differences at that season.

FICKER¹ mentions the warm spring as especially characteristic of Kashgaria. This continental feature of the climate is further accentuated there by the absence of a melting covering of snow. Owing to the expedition being at that time, at the end of March and the beginning of April, 1907, in the Tian Shan mountains, where there were great quantities of snow, our materials do not throw particular light on this question.

The daily range of temperature *A* varies very much in table No. 1 owing both to changes of the seasons and to the conditions of the terrain, as well as to varying cloudiness and other incidental disturbances. The latter, indeed, play an important part on account of the small number of available observations. Among high mean figures for the amplitude reference should be made to 15.8° C in Kashgaria in October, 1906, 17.1° at Hami in October, 1907, 22.3° at Kanchow in December, 1907, and 13.3° in the mountains round Taochow and the Labrang monastery in March, 1908. The last figure is remarkable owing to the altitude of the district above the sea (2980 m).

The influence of cloudiness on the amplitude is shown by the following comparison between clear and dull days. Those days have been considered as clear, on which both the evening and morning observations record the cloudiness as 0—2, and those days as dull, on

which at such times the cloudiness is recorded as 8—10. The places, for which the mean could be obtained for at least three clear days, are:

Place	Altitude	Date	Clear days		All days		Dull days	
			A	n	A	n	A	n
Yarkand	1270	17.10—20.11	9.6	12	9.5	24	10.9	1
Urumchi	912	26. 7—25. 8	15.3	4	12.7	23	8.9	3
Kucheng	700	4. 9—18. 9	18.3	3	16.0	5	12.5	2
Suchow	1540	1.12— 9.12	12.2	3	10.7	8	7.2	1
Lanchow	1554	30. 1—17. 3	11.2	4	9.4	38	8.7	11

Even though the figures are doubtful on account of the small number of days, the decrease of the daily range in case of increasing cloudiness is perfectly clear.

During HEDIN's expedition, in March, 1932, during five clear days at Edsingol (42° N, 100° E), HAUDE⁶ obtained a mean rise of temperature from sunrise to the maximum temperature of 21.5° C at a height of 2 m above the surface of the ground. J. v. HANN records, according to HEDIN's observations for Tarim Jangiköl (41° N, 87° E), monthly mean values of the daily range of temperature varying between 15.2° in January and 22.5° in May. The greatest variations in temperature in the course of a day according to MANNERHEIM's records are as follows:

Station	Date	Temperature		
		Rise	Fall	Mean variation
Kura ..	10—11 May 1907	22.0	26.1	24.1
Onu-su	22—23 » 1907	21.3	21.6	21.5
» »	23—24 » 1907	17.8	24.2	21.0
Qarasu .	30—31 » 1907	21.2	21.2	21.2
Hami ..	28—29 Oct. 1907	21.8	19.1	20.5
Kanchow	21—22 Dec. 1907	22.2	22.6	22.4
Mean		21.1	22.5	21.8

The mean for these extreme cases is 21.8° which corresponds very well with the figures recorded by the authors referred to. It should be borne in mind in all such comparisons that the configuration of the land and the natural ventilation play a very important part as regards the extent of the daily variation of temperature, so that greatly varying figures may be obtained for it.

Atmospheric pressure.

Observations of the atmospheric pressure are mainly of interest for determining altitude barometrically. As simultaneous observations at different levels are not available, but comparisons can only be made between observations made at different times, the precision of the barometric determination of altitude is to a large extent dependent on the variability of the atmospheric pressure. In table No. 2 we therefore give a survey of the variability of the atmospheric pressure in such places, in which the expedition stayed for some time.

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The table contains principally the mean atmospheric pressure b , the highest reading b_M and the lowest reading b_m during the time mentioned. The difference $\Delta b = b_M - b_m$ indicates the total variation of atmospheric pressure during the time referred to, while Δ_{24} is the greatest change observed during 24 hours.

Table 2. Survey of variations of atmospheric pressure.

Station	Date	b	b_M	b_m	Δb	Δ_{24}
Yarkand	17.10-31.10.06	656	662	648	14	9
"	1.11-19.11	659	665	652	13	8
Khotan	29.11-10.12	647	651	642	9	5
Yarkand	22.12-28.12	663	666	659	7	-3
Kashgar	3. 1-26. 1. 07	651	660	645	15	10
Aqsu	1. 3-25. 3	662	670	653	17	-10
Qulja	12. 4- 3. 5	702	709	693	16	11
Qarashahr	5. 7-12. 7	661	667	658	9	-6
Urumchi	26. 7-25. 8	678	688	672	16	8
Kucheng	4. 9- 17. 9	691	696	685	11	7
Barkul	12.10-19.10	626	629	622	7	7
Hami	25.10-29.10	694	699	686	13	-7
Ansi	9.11-21.11	664	669	657	12	9
Suchow	1.12- 8.12	640	646	633	13	8
Kanchow	18.12- 6. 1. 08	638	644	630	14	-5
Lianchow	14. 1-21. 1	629	635	622	13	11
Lanchow	30. 1-29. 2	630	639	622	17	-8
"	1. 3-16. 3	630	637	621	16	8
Si-an-fu	27. 4-13. 5	720	735	711	24	14
Tai-yuan-fu	7. 6-16. 6	685	690	681	9	-5

Although the periods dealt with are fairly short, they indicate a total variation of atmospheric pressure Δb amounting to between 7 and 17 mm, at Si-an-fu even to 24 mm. As a comparison the following mean values of the monthly variation of atmospheric pressure in various latitudes for continental places in Asia, calculated by KÖPPEN, may be mentioned. If we include the four places, for which monthly figures can be obtained during the MANNERHEIM expedition, we obtain the following results in mm:

Place	Date	Mannerheim	Köppen
Yarkand	17.10-20.11	17	20
Kashgar	3. 1-26. 1	15	21
Urumchi	26. 7-25. 8	16	14
Lanchow	30. 1-29. 2	17	17
Mean		16	18

In contrast to KÖPPEN, no distinct seasonal influence is found in this case, whereas the correspondence between the mean values is fairly good.

The greatest daily variations Δ_{24} average 8 mm. In view of the fact that at 0° C and a barometer level of 650 mm the atmospheric pressure decreases by 1 mm in 12.3 m, the

margin of error in an altitude calculation by means of barometer figures, obtained at two closely situated points of observation within an interval of 24 hours, must be estimated at about one hundred metres. In case of a shorter time, e.g., from the time of making the morning or evening observation to the time of crossing a pass at a considerable height, the error caused by the variability of the atmospheric pressure will, of course, be smaller.

In such calculations of altitude by means of a barometer formula the influence of the watervapour and the variations in the force of gravity at increasing heights above sea-level is negligible in comparison with the uncertainty arising in calculating the mean temperature of the air stratum. For establishing the latter we assume a linear change of temperature according to height. As the temperature of the air was not determined generally in crossing high passes or mountain ridges, the calculation of the mean temperature of the air stratum requires a knowledge of the existing vertical gradient of temperature. FICKER calculated the mean values of this gradient of temperature for the three pairs of stations Lukchun-Kashgar, Lukchun-Urumchi and Kashgar-Irkeshtam (cf. Lit. I tab. II p. 376). The mean values obtained for these three pairs of stations at the various seasons of the year are as follows for the vertical gradient of temperature in Central Asia, expressed in 0.01° C per 100 m:

winter	spring	summer	autumn	annual mean
24	70	73	47	53

For the sake of completeness we give these values which seem to us to be the best that can be employed at present for calculating the temperature of the intermediate air stratum from only one reading of the temperature.

Cloudiness.

In the series of observations which he studied more closely FICKER¹ found an unusually great cloudiness in Eastern Turkestan, which is all the more striking on account of the small rainfall. The cloudiness was greatest in Kashgaria which is protected by mountains on the circumference. For Kashgar FICKER records an annual mean of 53 per cent, while Uliassutai has 34, Urumchi 37 and Lukchun 38 per cent. If we calculate the mean cloudiness, in the same way as before in the case of the mean temperature, for the same season of the year according to the monthly mean in FICKER's table and according to the figures obtained by MANNERHEIM's expedition, we obtain the following table (M = MANNERHEIM, F = FICKER):

Place	Date	M	F	M—F
Urumchi (M & F)	26.7—25.8	41	35	6
Turfan (M), Lukchun (F)	24.9—28.9	22	24	—2
Yarkand (M), Kashgar (F)	17.10—31.10	14	53	—39
do.	1.11—20.11	30	58	—28
do.	22.12—28.12	53	60	—7
Kashgar (M & F)	3.1—26.1	56	56	0

The figures correspond closely in August, September and January, but during the MANNERHEIM expedition a considerably lower cloudiness was obtained in Yarkand in October and November, a divergence which recurs partly in December. At the end of October and the first half of November MANNERHEIM's records yield a mean value of w
 22 %, which is less than the value of 30 % obtained during the same season of the year from FICKER's table for the oasis of Lukchun. From EKHOLM's revision of the meteorological observations carried out during HEDIN's⁹ earlier explorations in the same districts, the following monthly means are obtained for the cloudiness:

November 1899 abt. 80—85°E, 40° N	18 %	January 1896 round Khotan	34 %
December 1895 round Yarkand . .	20 »	» 1900 abt. 85° E, 38° N . .	60 »

Here again we find extremely low values for November and December, whereas January has a very variable cloudiness. Thus HEDIN's figures support the low cloudiness during late autumn in Kashgaria experienced during the MANNERHEIM expedition.

Precipitation.

With regard to the precipitation FICKER mentions a maximum in April and May in Eastern Turkestan while HEDIN⁷ experienced heavy summer rains at Urumchi. MANNERHEIM stayed at Qulja from April 12th to May 3rd, 1907, but during that time very light rain is recorded only twice and rain on two occasions. In May and June the expedition was in the Tian Shan mountains and during those months the rainfall was abundant. During the ride from Qulja to Qarashahr from May 5th to July 5th altogether 36 days with rain are recorded. At Urumchi, however, from July 26th to August 28th, 1907, very light rain is only recorded four times and once a westerly storm accompanied by rain. During the subsequent period, up to the middle of October, rain is only recorded four times. Up in Barkul the first fall of snow is recorded on October 15th. During the ride through the desert regions from Hami to Ansi no rain fell.

From January 30th to March 16th, 1908, the expedition stayed at Lanchow, and during that time 12 days of snow are recorded. At the beginning of April the expedition was in the mountains round Taochow and Minchow, but then descended to Si-an-fu, the latter town being reached on April 27th. During that month 14 days of rainfall are recorded. The rainy spring was succeeded by an early summer with comparatively little rain, only 5 days with rain being recorded from May 1st to June 15th. In the middle of June the influence of the monsoon makes itself felt by a great increase in the rainfall. From June 16th to the end of the record on July 20th 19 rainy days are recorded, 8 of them with thunderstorms.

Thus there are three distinct periods of rainfall, the first in May and June, 1907, in the Tian Shan mountains, the second in April, 1908, in the mountains round Taochow and Minchow, and finally the monsoon rains from the middle of June to the end of the journey.

If we study the direction of the wind during the days, on which rain fell, we find that during the period August 16th, 1906—April 28th, 1907, a heavy rainfall occurred as a rule

with a north or east wind. Of 17 such cases wind with a northern component is recorded 10 times, an east wind twice and calm weather on three occasions. During the rainy period in May and June, 1907, rain fell with a varying direction of the wind, but in these cases it was mostly local showers in the mountainous districts, whereas in the former case it was an irruption of cold air from the north.

The main diary contains some data concerning the snow and rain, communicated by the local population of a number of places. A snowfall during the winter months is reported in all places up to Si-an-fu, although the snow west of Suchow usually melts a couple of days after it has fallen. The places round Taochow and Minchow, situated high up in the mountains, form the only exception. In the Tian Shan the depth of the snow reaches 1.5 m. In the desert regions between Hami and Suchow a depth of snow of 20—35 cm is recorded from November to March.

There are some notes, too, in the diary concerning the typical setting in of cold air accompanied by storm and snow. On May 24th, 1907, the expedition was surprised at Khaptkau-su by a storm, the like of which MANNERHEIM had not experienced formerly. The temperature fell from 18.3° C to -0.4° and a heavy hailstorm changed to a snowstorm. Between November 19th and 23rd, 1907, snow fell in the neighbourhood of Ansi with a strong E to NE storm. The minimum temperature, which was -3.5° C on the morning of November 19th at Kua-tien-tzu, dropped on the following day to -13.9° C at Kbadjsju-ku-tzu and reached its lowest point during the winter at Pu-lung-chi on November 24th at -25.6° C. Finally reference should be made in this connection to the snowfalls at Yavur-Khargan usun in the Tian Shan at an altitude of about 2700 m at midsummer in 1907, apparently from orographic causes. On the morning of June 23rd, when the snowfall ceased, 33 cm of snow are recorded there in the middle of the summer.

Force of the wind.

The force of the wind in Central Asia has a very distinct diurnal variation with strong wind during the day and calm nights. As the observations of the wind were generally not recorded at midday, we cannot illustrate this question statistically on the basis of the available figures, but can only mention that in many of cases strong wind is recorded during the day, which decreases considerably in the evening or drops altogether.

In Kashgaria the force of the wind was slight throughout the autumn of 1906 and the winter of 1906/07. During the period October 8th, 1906, to March 1st, 1907, only 7 days are recorded with strong wind (≥ 3), of which north wind (NNE, N, NNW) on 3 occasions and E wind on two occasions. These figures afford further confirmation of the circumstance already referred to, that the winter is a calm season in these regions owing to the protecting mountains on the circumference, only interrupted by the irruption of cold air from the N to NE.

For the rest of the time we confine ourselves to examining the mean force of the wind v and the number of days n with strong wind (≥ 3). With regard to the estimate of the force of the wind the reader is referred to page 5. The following table is obtained:

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Year	1907										1908				
	III	IV	V	VI	VII	VIII	IX	X	XI	XII	I	II	III	IV	V
v morning	1.1	1.0	1.3	1.2	1.2	1.5	1.5	1.3	1.5	1.1	0.9	1.1	0.5	0.4	0.7
v evening	1.0	1.0	1.8	2.1	1.3	1.2	1.1	1.3	1.6	0.7	1.1	0.8	1.2	0.8	0.8
v mean	1.1	1.0	1.6	1.7	1.2	1.4	1.3	1.3	1.6	0.9	1.0	0.9	0.8	0.6	0.8
n	4	4	10	11	7	7	6	7	9	5	7	0	4	4	4

We find two periods of strong wind, May—June, 1907, and November, 1907, both with a mean of 1.6. The former period coincides with the rainy period in the Tian Shan mountains already mentioned and is evidently a convection phenomenon caused by the circulation of the air in the mountain districts. With regard to the latter windy period it is worth mentioning that HAUDE⁶, too, pointed out November as a month with strong wind in these districts. At this time the winter sets in and for several places numerous burans are recorded which cause an increase in the calculated mean force of the wind at that time.

Direction of the wind.

A statistical examination of the notes in the journal concerning the direction of the wind showed that the latter varied to such extent in the regions, intersected by great chains of mountains, traversed by the expedition, that no general conclusions could be drawn from the materials. However, we will deal at slightly greater length with the notes concerning the occurrence of burans which are recorded in the main diary. Although the data concerning the direction of the wind vary very much in these notes, some general features are, nevertheless, visible.

For the places on the route from Qulja via Urumchi and Kucheng to Kona-shahr in the mountains north of Turfan a westerly direction is recorded throughout in the case of the strongest storms. This is evidently a case of an irruption of polar air which flows in towards Mongolia through the Jungarian gateway and is forced to follow the direction of the Tian Shan mountains. On the route from the Tian Shan pass between Barkul and Hami down to Suchow mostly easterly storms are recorded again, more rarely westerly. The cold air forcing its way forward north of Tian Shan rounds this mountain chain east of Barkul and then penetrates in the form of a cold easterly current into the Taklamakan and the Tarim basin across the plain between Hami and Suchow. At Suchow the current of air coming from the north is divided, one branch being forced against the Nanshan and Altyn Tagh towards Turkestan, while another branch follows the Nanshan mountains in an easterly direction. Between Suchow and Lanchow therefore, according to the statements of the local population, the burans generally come from the west or north.

Burans are most frequent in the spring, the autumn and winter coming next. The number of burans occurring annually varies greatly according to the records in the main diary, mainly owing to the orographic conditions, but probably also to the uncertainty in defining a buran. We therefore refrain from detailed statistics and refer the reader in this connection to the original notes.

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Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations								Morning Observations								
	Day	Time	b	t	w	v	t _M	Remarks	Day	Time	b	t	w	v	t _m		
Gulcha .. 1906	13	-	-	-	-	-	-	-	14	7.00	633	-	1	0	-		
Yangryk .. Aug.	14	19.00	615	-	-	-	-	-	15	»	616	-	8	SSW	19.7		
»	15	»	616	-	1	NNW	31.2	p ●	16	»	615	-	0	S	14.7		
Kurtuk Ata ..	16	19.30	583	18.3	8	NNE	-	p ●	17	»	583	-	4	SSW	10.8		
Kök Bulaq ..	17	19.00	544	-	3	W	26.0	-	18	»	544	-	1	SSW	5.8		
Khatun Art ..	18	»	523	11.4	5	NW	-	-	19	»	524	-	9	SSE	0.4		
»	19	»	523	-	9	N	18.3	-	20	»	524	-	10	SW	4.5		
»	20	»	524	-	10	-	15.0	a, d, p ●	21	»	524	-	5	NNW	0.0		
Tumburun ..	21	20.30	506	-	9	NNE	-	-	22	»	506	-	7	SSW	-0.3		
»	22	19.00	506	-	10	-	-	p * ¹	23	-	-	-	-	-	-		
Naghara-chaldi ..	24	19.30	561	12.4	9	SSE	-	-	25	7.00	559	-	10	SSW	10.8		
Ulugh-chat ..	25	19.00	567	-	-	-	14.4	a ●	26	»	567	-	9	NNW	8.7		
Uksalur ..	26	»	576	-	-	-	-	-	27	»	577	-	0	NW	6.7		
Qizil-ui ..	27	19.00	591	-	10	NE	-	-	28	»	591	-	9	ENE	-		
»	28	»	590	-	9	ENE	27.1	-	29	»	592	-	7	NNE	12.4		
Ming-yul ..	29	-	617	-	-	-	-	-	30	»	617	-	0	ENE	11.1		
Kashgar .. 1906	7	-	-	-	-	-	-	-	8	6.30	653	13.3	0	-	8.1		
Yapchan .. Okt.	8	18.30	650	20.0	0	0	-	-	9	»	652	8.3	0	-	9.0		
Yangi Hissar ..	9	»	647	23.0	0	0	-	d 1 W	10	»	649	15.8	5	0	-	10.3	
»	10	»	646	19.2	3	0	-	24.9	d 1 NNE	11	»	648	9.9	0	0	-	9.1
Qizil ..	11	»	645	25.3	8	1 WSW	-	-	12	»	647	13.1	0	1 WSW	7.5		
Kurabat ..	12	»	650	20.4	2	1 SE	-	d 1 NNW	13	»	653	16.5	0	1 NE	13.5		
Yarkand ..	-	-	-	-	-	-	-	-	17	»	660	10.1	0	0	-	8.6	
»	17	18.30	658	13.7	0	0	19.4	-	18	»	659	7.9	4	1	-	7.6	
»	18	»	656	14.4	0	1 NNW	18.4	d 1 NNW	19	»	657	9.5	7	0	-	9.1	
»	19	»	656	14.0	0	NNW	18.3	p 1 NNW	20	»	657	10.1	9	1 NNW	9.9		
»	20	»	656	13.9	0	0	18.4	-	21	»	658	9.0	1	0	-	8.9	
»	21	»	-	-	-	-	-	-	22	»	660	5.4	0	2 N	5.3		
»	22	»	657	12.0	0	0	-	-	23	»	657	8.4	4	1 NNW	8.0		
»	23	»	656	13.7	3	1 W	15.0	-	24	»	657	6.5	0	0	-	5.8	
»	24	»	655	-	0	0	15.1	-	25	»	655	5.5	0	0	-	5.3	
»	25	»	652	11.5	0	0	15.4	-	26	»	653	6.2	0	1 N	5.9		
»	26	»	650	12.4	2	0	16.7	-	27	»	651	6.9	1	2 N	6.2		
»	27	»	648	14.1	3	1 NNW	18.4	-	28	»	652	6.6	3	1 N	6.1		
»	28	»	657	13.3	4	2 NNW	16.0	d 3 NNW	29	»	660	4.5	0	1 NNW	4.2		
»	29	»	658	8.7	0	0	-	-	30	»	656	2.6	0	0	-	2.4	
»	30	»	653	8.0	0	0	-	-	31	»	653	2.5	1	0	-	1.5	
»	31	»	656	9.7	0	0	-	-	1	»	662	4.9	0	2 WSW	4.0		
»	1	»	663	5.1	0	1 WSW	-	-	2	»	662	0.4	10	0	-	0.1	
»	2	»	660	4.2	10	1 WSW	-	1)	3	»	661	2.9	10	0	-	2.4	
»	3	»	662	4.9	0	0	6.5	-	4	»	663	0.3	10	1 W	-0.4		
»	4	»	660	4.1	0	0	6.9	w = 10°	5	»	659	-1.0	10	1 SW	-1.1		
»	5	»	659	3.7	0	1 SW	7.2	w = 10°	6	»	661	-0.8	10	0	-	-0.9	
»	6	»	661	4.6	0	0	7.6	-	7	»	661	0.8	10	1 SW	0.4		
»	7	»	661	5.0	0	1 SW	8.1	-	8	»	661	0.0	10	0	-	0.0	
»	8	»	660	4.4	0	0	7.6	-	9	»	659	-0.9	0	0	-	-1.0	
»	9	»	656	4.2	0	0	7.4	-	10	»	654	-0.9	1	-	-	-1.1	
»	10	-	-	-	-	-	-	-	11	»	652	0.1	0	1 SW	-1.2		
»	11	»	652	5.4	0	1 SW	9.0	-	12	»	652	1.1	0	0	-	0.3	

1) 2. 11. The leaves began to fall from the trees in abundance.

RUNAR MEINANDER

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations								Morning Observations						
	Day	Time	b	t	w	v	tM	Remarks	Day	Time	b	t	w	v	t _m
Yarkand .. 1906	12	18.30	652	7.6	0	2 SW	12.2		13	6.30	655	2.8	0	1 SW	2.5
" .. Nov.	13	"	652	8.1	10	0 -	12.2		14	"	657	1.6	8	1 SW	1.4
" 	14	"	658	5.3	0	1 SW	8.9		15	"	659	0.5	2	0 -	-0.3
" 	15	"	658	5.8	0	1 E	8.7		16	"	657	1.1	6	1 SW	0.6
" 	16	"	657	7.0	0	0 -	11.1		17	"	657	1.6	1	1 SW	1.2
" 	17	"	658	7.6	0	0 -	12.5		18	"	665	0.6	0	1 SW	0.3
" 	18	-	-	-	-	-	-		19	"	664	-2.6	0	0 -	-3.0
" 	19	-	-	-	-	-	-		20	"	660	-3.3	0	0 -	-3.5
Posgam	20	18.30	654	4.0	0	1 SSE	8.5		21	"	656	-2.6	0	1 SSE	-3.3
Karghalik	21	"	649	0.4	0	1 S	-		22	"	647	-4.2	0	1 SE	-4.6
Kosh Langar ..	22	"	643	2.9	5	2 WSW	-		23	"	644	-1.9	4	3 SW	-3.5
Tchvo lack Lang.	23	"	641	2.8	0	2 S	8.5	d 3 S	24	"	642	-3.7	1	2 WSW	-5.0
Guma	24	"	651	2.9	0	2 SW	-		25	"	656	-3.7	0	1 SW	-4.2
Moji	25	"	653	-1.1	0	1 NE	-		26	"	649	-8.0	0	1 S	-9.1
Zanguya	26	19.30	647	-3.3	1	0 -	2.2		27	"	647	-6.7	8	1 SW	-8.4
Pialma	27	18.30	649	0.6	8	1 WSW	-		28	"	650	-5.1	0	0 -	-5.5
Zawa	28	"	650	0.3	4	1 WSW	-		29	"	649	-5.3	5	-	-6.2
Khotan	29	"	643	0.6	10	0 -	-		30	7.30	642	-4.5	0	1 SSW	-5.0
" 	30	"	642	0.1	9	0 -	-		1	6.30	644	-3.7	0	1 SSW	-5.1
" .. 1906	1	"	646	-1.7	2	1 SSW	-		2	"	649	-3.6	1	1 NNE	-5.3
" .. Dec.	2	"	650	3.7	8	1 S	-		3	"	651	0.0	9	1 SW	-0.4
" 	3	18.00	649	0.9	0	1 SW	7.2		4	"	647	-5.6	0	0 -	-6.1
Yotkan	4	18.30	647	0.1	8	1 NW	-		5	"	648	-4.9	-	1 NW	-6.0
Sipsia	5	19.00	644	-2.4	0	1 SSE	-		6	"	645	-3.5	6	0 -	-5.4
Tamaghil	6	-	-	-	-	-	-		7	7.30	648	-2.6	5	0 -	-
Khotan	7	-	-	-	-	-	-		8	6.30	649	-5.0	0	0 -	-5.4
" 	8	18.30	647	-2.4	0	1 SSW	-		9	"	648	-6.5	3	0 -	-7.0
" 	9	"	648	-2.4	0	1 W	4.1		10	"	648	-5.3	6	0 -	-6.5
" 	10	"	647	0.0	4	0 -	5.8		11	"	648	-5.1	7	0 -	-6.5
Langhru	11	19.15	632	-2.9	0	1 S	-		12	"	630	-6.2	8	-	-7.0
Pujiya	12	18.30	611	-3.7	0	1 SSE	-		13	"	610	-7.8	4	1 W	-9.7
Duwa	13	19.30	613	1.1	4	1 ESE	-		14	7.00	613	-1.2	8	2 SE	-
" 	14	18.30	613	2.4	0	1 S	9.6		15	6.30	612	0.1	0	2 S	-
Puski	15	19.00	601	4.2	3	1 NE	-		16	7.30	607	-0.3	0	1 NNE	-0.6
Sulgahiz langar	16	18.30	605	-2.0	0	2 SE	-		17	6.30	605	-2.9	8	1 ENE	-6.6
Sazan	17	"	590	-6.5	0	2 WNW	-		18	"	591	-12.8	0	1 SE	-13.6
Bora	18	"	623	-4.1	4	1 WNW	-		19	"	622	-12.8	0	1 SE	-13.4
Karghalik	19	"	646	-3.1	10	0 -	-		20	"	648	-4.9	10	0 -	-5.3
" 	20	"	648	-5.1	10	0 -	-1.2	* 1)	21	"	649	-6.2	10	0 -	-7.1
" 	21	"	658	-4.6	10	0 -	-	* 1)	22	"	661	-6.2	10	0 -	-6.6
Posgam	22	"	664	-4.2	0	1 SSW	-		23	"	664	-6.9	10	0 -	-9.0
Yarkand	23	19.00	664	-6.5	2	1 N	-0.9	* 1)	24	7.00	665	-6.7	10	0 -	-8.3
" 	24	-	-	-	-	-	-	a * 1)	25	"	664	-6.6	10	1 SSW	-8.0
" 	25	18.30	665	-4.2	9	0 -	-	a * p ☉	26	6.30	665	-11.5	10	1 S	-12.1
" 	26	"	666	-4.9	0	0 -	-	d ☉	27	"	665	-11.5	9	0 -	-12.0
" 	27	-	-	-	-	-	-		28	"	662	-11.0	0	0 -	-
" 	28	19.00	661	-4.2	0	1 NNW	-		29	"	659	-11.2	3	0 -	-11.6
Kök Rabat	29	18.30	656	-5.4	8	1 SE	-		30	"	656	-11.2	0	0 -	-11.6
" 	30	"	661	-2.2	3	1 SW	5.9		31	"	661	-5.9	9	1 SSW	-7.2
Qizil	31	"	664	-3.0	10	1 NE	-	a * p ☉	1	"	661	-11.9	0	1 W	-13.3

1) 20. 12. Snow has been falling during the night since 11 o'clock last night. It goes on falling. The layer of snow is 1 inch. thick.

21. 12. The fall of snow continues.

23. 12. The fall of snow, that was interrupted yesterday, began again, but again very slightly.

METEOROLOGICAL NOTES

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations							Morning Observations							
	Day	Time	b	t	w	v	t _m	Remarks	Day	Time	b	t	w	v	t _m
Yangi Hissar 1907	1	18.30	660	-4.1	2	0	-	-	2	6.30	659	-13.4	1	1 S	-13.7
Yapchan .. Jan.	2	*	659	-1.5	0	0	-	-	3	*	657	-8.5	-	-	-8.9
Kashgar	3	-	-	-	-	-	-	-	4	*	653	-6.9	-	-	-7.8
"	4	-	-	-	-	-	-	-	5	8.00	650	-7.8	6	1 SW	-9.2
"	5	-	-	-	-	-	-	-	6	7.30	660	-7.2	0	0	-7.4
"	6	-	-	-	-	-	-	-	7	6.30	657	-10.6	0	1 SW	-11.1
"	7	-	-	-	-	-	-	-	8	7.00	656	-11.2	0	1 SW	-11.6
"	8	19.00	655	-6.7	0	0	-0.5	-	9	6.30	657	-6.5	10	1 S	-
"	9	*	655	-4.7	6	1 NE	-	-	10	*	654	-8.3	10	1 NNW	-9.7
"	10	-	-	-	-	-	-	-	11	*	654	-11.9	8	1 SW	-12.4
"	11	18.30	655	-6.6	0	1 SW	-2.2	-	12	*	654	-11.5	2	0	-12.0
"	12	19.15	652	-7.0	2	0	-1.5	-	13	*	651	-10.4	8	1 SSW	-11.0
"	13	19.30	650	-5.9	0	1 SW	-0.3	-	14	7.30	649	-8.6	7	1 SSW	-
"	14	19.15	647	-4.7	10	0	-	-	15	*	648	-8.5	10	2 SE	-
"	15	*	651	-4.0	0	0	2.4	-	16	7.00	655	-6.5	0	3 N	-7.6
"	16	-	-	-	-	-	-	-	17	7.30	655	-6.7	10	1 SSW	-7.6
"	17	-	-	-	-	-	-	-	18	7.00	651	-8.1	9	0	-8.6
"	18	18.30	648	-2.6	10	0	1.5	-	19	7.30	649	-4.4	2	1 S	-4.7
"	19	-	-	-	-	-	-	-	20	*	652	-5.8	1	0	-6.2
"	20	-	-	-	-	-	-	-	21	7.00	649	-2.1	10	1 E	-2.4
"	21	19.00	648	-0.1	10	1 SW	4.6	-	22	*	649	-7.2	2	0	-7.5
"	22	19.30	-	-1.9	5	0	11.7	-	23	7.30	649	-3.4	3	1 NNE	-4.0
"	23	19.00	646	-0.1	8	0	4.0	1)	24	8.00	645	-6.4	2	1 SW	-7.6
"	24	18.15	645	0.0	10	-	4.6	1)	25	7.00	646	-6.2	10	1 SE	-7.0
"	25	19.45	645	-1.2	10	1 NE	2.6	1)	26	6.30	646	-2.0	10	1 N	-6.7
"	26	-	-	-	-	-	-	n *	27	8.00	661	-2.1	10	1 NW	-2.9
Yandasu	27	-	-	-	-	-	-	* 1)	28	6.30	662	-3.3	10	0	-4.6
Yangiabad 1907	1	18.30	661	-6.4	10	1 NW	-	p *	2	*	661	-14.6	3	-	-14.9
QaraYulghun	2	*	662	-7.5	9	1 N	-	d *	3	*	662	-9.7	10	1 NNE	-10.8
Ordeklik Febr.	3	*	663	-7.6	0	1 SW	-	-	4	7.00	665	-13.3	2	-	-14.1
"	4	19.30	667	-6.7	-	-	-0.6	-	5	7.15	667	-13.3	4	0	-14.1
Qara Kichin ..	5	18.30	664	-8.4	3	0	-	-	6	7.00	662	-14.0	7	1 SW	-14.9
Churga utang	6	*	662	-5.5	3	0	-	-	7	6.30	661	-11.4	10	0	-11.7
Maral Bashi ..	7	18.30	664	-6.2	0	0	-	-	8	*	666	-13.5	3	1 S	-14.4
"	8	*	665	-3.6	9	0	2.2	-	9	*	668	-13.5	2	1 SE	-14.2
"	9	*	664	-3.0	10	0 NNW	2.6	-	10	*	667	-8.0	6	1 N	-9.2
c. Duvantagan ..	10	-	-	-	-	-	-	-	11	*	667	-11.1	10	0	-
c. Achal	11	-	-	-	-	-	-	-	12	*	669	-11.2	10	3 WNW	-
Kelpin	12	18.30	661	-5.4	6	2 N	-	-	13	*	660	-11.9	6	0	-13.0
"	13	19.00	660	-2.8	9	2 SW	3.5	d ⊙	14	*	659	-10.8	0	1 S	-11.5
c. Saizam	14	18.30	635	-5.6	0	2 NNE	-	d ⊙	15	*	636	-8.3	4	0	-9.6
c. Balnung Tube	15	21.00	560	-8.6	9	2 E	-	d ⊙ p *	16	*	562	-11.4	10	0	-14.9
Belyng Tupese dawan	-	-	-	-	-	-	-	Hyps.	16	10.00	555	-3.9	-	-	-
c. Qizil tagh	16	18.30	584	-14.6	8	2 NNE	-	n, a * d ⊙	17	6.30	587	-15.4	-	-	-18.0
Uch Turfan	17	21.30	642	-8.0	0	0	-	a ⊙	18	*	643	-8.9	9	1 S	-10.9
"	18	19.00	641	-3.5	3	2 N	-	d ⊙	19	*	644	-7.8	9	-	-10.0
"	19	19.30	644	-3.9	6	1 N	3.1	-	20	*	642	-9.5	1	1 SW	-10.4
"	20	19.15	-	-4.0	0	1 W	-	-	21	*	642	-8.4	0	1 NNW	-9.7
"	21	19.00	642	-2.0	6	0	-	-	22	8.00	643	-5.1	0	1 W	-8.9
"	22	18.30	-	-2.8	0	0	-	3.1	23	6.30	641	-7.6	0	0	-9.1

1) 23. 1. Two earthquakes, the second at 6.22 p. m. Both of them in south-westerly direction.
 24. 1. A slight earthquake in south-westerly direction at 10 p. m.
 25. 1. At 3.23 p.m. and 4.11 p.m. two earthquakes in south-westerly direction.
 27. 1. Fall of snow since last night. Light snowflakes. The day has been dull and snow has continued to fall until about 4 o'clock p.m

RUNAR MEINANDER

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations								Morning Observations								
	Day	Time	b	t	w	v	tM	Remarks	Day	Time	b	t	w	v	t _m		
Bashaghma Ka- raul .. 1907	23	19.00	622	-2.4	0	2	N	-		24	6.30	621	-8.7	0	1	W	-9.7
Yamansu .. Febr.	24	19.15	634	-1.2	0	0	-	-		25	»	634	-	0	0	-	-9.2
Onylik	25	18.30	647	2.8	5	2	NNW	-		26	»	650	-4.1	1	2	NNE	-5.0
Sughun	26	»	657	2.6	1	1	N	pN ¹⁾		27	»	660	-3.6	7	1	S	-4.5
Aral Kitchik ..	27	19.15	665	2.2	10	1	W	p 3 E		28	»	663	-0.3	10	-	-	-2.2
Qara Döbe	28	20.00	664	1.7	10	0	-	p 3 E		1	»	661	-2.2	10	1	W	-3.7
Aqsu 1907	1	-	-	-	-	-	-	-		2	10.30	664	5.3	8	1	W	-1.2
» .. March	2	18.45	664	5.0	0	1	W	-		3	-	-	-	-	-	-	
»	3	18.30	669	6.1	0	1	W	-		4	8.00	670	2.1	0	1	NW	-0.5
»	4	20.30	667	5.3	0	1	E	-		5	-	-	-	-	-	-	
»	5	-	-	-	-	-	-	-		6	7.30	663	1.1	5	0	-	0.5
»	6	20.00	657	5.1	0	1	N	9.6		7	6.30	653	0.5	9	0	-	0.0
Beshtugemen ..	7	18.45	657	4.7	9	0	-	-		8	»	660	2.9	10	3	SSE	0.6
Matan	8	19.00	666	4.5	10	1	N	1)		9	»	669	4.1	10	3	SE	3.9
Khotan Kimässi	9	»	672	1.1	0	2	N	1)		10	»	673	-5.6	1	1	N	-6.1
Matan (mähällä	10	18.30	668	2.9	0	0	-	-		11	»	667	1.1	10	0	-	0.1
Wakhpe	11	»	664	2.5	0	1	NNE	-		12	»	664	-1.6	6	0	-	-3.4
Aqsu	12	-	-	-	-	-	-	-		13	7.45	660	2.9	10	2	NW	-
»	13	18.30	660	3.6	8	0	-	6.0		14	6.30	663	2.2	-	1	ENE	0.6
»	14	19.00	664	5.0	0	1	E	8.3		15	»	666	3.0	9	1	SE	0.9
»	15	18.30	665	5.3	0	0	-	8.5		16	»	666	1.1	3	2	NE	-0.1
»	16	19.45	664	5.3	0	0	-	8.7		17	»	664	1.4	1	1	NNE	1.1
»	17	21.00	663	3.9	0	1	NNW	9.6		18	»	662	3.3	0	0	-	0.0
»	18	20.45	661	7.1	-	1	NNW	9.9		19	»	661	1.2	1	1	NNW	-0.1
»	19	19.45	660	7.2	-	1	N	11.2		20	»	662	1.9	0	1	NNW	0.8
»	20	-	-	-	-	-	-	-		21	-	-	-	-	-	-	-
»	21	-	-	-	-	-	-	-		22	-	-	-	-	-	-	-
»	22	-	-	-	-	-	-	-		23	-	-	-	-	-	-	-
»	23	-	-	-	-	-	-	-		24	6.30	660	2.2	5	1	NNW	1.4
»	24	20.00	655	8.7	0	0	-	12.9		25	»	656	2.2	3	0	-	0.8
»	25	19.00	656	10.1	0	0	-	13.4		26	»	660	5.6	10	1	NNE	5.0
Jam	26	19.30	655	5.5	7	2	NW	d v = 3-4		27	»	657	1.6	8	1	S	-0.5
Avat	27	18.30	632	-0.3	10	2	SSE	* 1)		28	»	633	-2.4	10	2	N	-3.4
Qizil Bulaq	28	»	608	-3.5	0	2	WNW	a * p (1)		29	»	608	-5.0	0	0	-	-7.0
Yangi Mähällä ..	29	»	585	-5.0	0	1	N	-		30	»	587	-6.5	0	2	N	-7.8
N. of	-	-	-	-	-	-	-	Hyps.		30	»	576	(7.8)	-	-	-	-
Kailik	30	19.15	579	-3.6	6	3	E	-		31	6.30	581	-5.9	10	3	S	-7.4
Tamga-tash	31	18.30	557	-6.0	3	2	-	d S ¹⁾		1	»	555	-9.2	0	1	S	-9.7
MuzartBashi 1907	-	-	-	-	-	-	-	Hyps.		1	-	517	(9.9)	-	-	-	-
Khan Jailik April	1	-	-	-	-	-	-	-		2	9.00	548	-3.3	10	1	N	-
»	2	19.30	549	-0.8	0	1	N	10.3		3	6.30	550	-7.9	0	1	SW	-10.3
Adingei	3	»	578	-5.9	0	2	ESE	p * 3 N ¹⁾		4	»	576	-8.0	0	0	-	-10.1
Shatá	4	-	-	-	-	-	-	-		5	»	604	0.3	0	1	N	-9.0
»	5	18.30	603	-4.1	0	1	ESE	7.4		6	»	600	0.6	0	2	NNE	-6.1
c. Gilan	6	19.00	616	-3.7	0	1	SE	-		7	6.00	613	-7.8	6	1	NE	-12.4
c. Khargontu ..	7	»	596	-4.5	10	1	NW	-		8	6.30	597	-3.4	10	1	N	1.1
Kura	8	18.30	604	2.1	10	1	E	7.2 d		9	»	604	-4.1	4	1	NNW	-6.5
c. Bugra	9	19.30	603	0.3	0	1	S	-		10	»	599	-1.1	2	1	N	-4.1
Girin dawan ..	-	-	-	-	-	-	-	Hyps.		10	»	588	(9.9)	-	-	-	-
Sá dawan .....	-	-	-	-	-	-	-	) Hyps.		10	-	556	(12.4)	-	-	-	-

1) 26. 2. In the afternoon a strong northerly gale with local sandwhirls.
 8. 3. A buran-like sandstorm in the day.
 9. 3. Ditto.
 27. 3. A northerly wind with hailshowers about 11 o'clock. Since about 12 o'clock a heavy fall of snow, first with a northerly wind.
 28. 3. The fall of snow ceased at 11.15 a.m. The afternoon very warm, sunshine.
 31. 3. A thick mist in the mountains. Strong wind from South (3 or 4) during the whole day; 2 in the evening, direction unknown in this mountaistrict.
 3. 4. Snowstorm from North from 10 a.m. til 4 p.m.
 10. 4. Snowstorm in the mountains. Further down prolonged rain.

METEOROLOGICAL NOTES

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations							Morning Observations							
	Day	Time	b	t	w	v	t _M	Remarks	Day	Time	b	t	w	v	t _m
Kan 1907	10	-	-	-	-	-	-	-	11	6.30	699	6.5	10	2 W	5.3
Khoghuntche	11	18.30	705	3.0	3	1 E	-	-	12	"	705	-	2	2 E	-2.5
Qulja April	12	-	-	-	-	-	-	-	13	"	697	7.6	-	-	0.5
"	13	-	-	-	-	-	-	-	14	"	697	7.8	-	-	0.5
"	14	18.00	697	15.4	10	1 SW	-	-	15	-	-	-	-	-	-
"	15	-	-	-	-	-	-	-	16	7.30	702	9.5	0	-	4.0
"	16	21.30	700	11.4	0	0 -	21.5	-	17	6.45	698	9.9	0	0 -	6.1
"	17	18.45	693	16.1	0	0 -	24.1	-	18	6.30	702	8.6	10	3 NNE	6.9
"	18	18.30	704	10.5	10	0 -	14.9	-	19	"	703	5.4	0	-	2.5
"	19	"	-	12.5	0	0 -	20.8	-	20	8.30	706	10.1	10	-	6.0
"	20	"	706	11.1	3	3 SW	17.4	a ☉	21	6.30	711	6.0	0	0 -	0.6
"	21	"	709	7.5	-	-	13.5	-	22	7.30	705	6.9	0	1 NE	1.0
"	22	19.00	698	12.2	3	3 NE	18.4	-	23	8.15	700	11.2	4	1 SW	3.9
"	23	"	705	11.0	10	2 SSW	18.3	-	24	6.00	708	6.1	3	0 -	2.9
Khui yuan tchen	24	18.30	-	11.9	0	0 -	-	-	25	6.30	706	8.7	0	0 -	4.2
Qulja	25	-	-	-	-	-	-	-	26	7.00	701	12.0	3	2 SW	-
"	26	18.30	704	15.6	8	0 -	21.0	-	27	-	-	-	-	-	-
"	27	-	-	-	-	-	-	-	28	7.00	699	12.6	9	1 NNE	11.1
"	28	20.45	698	13.9	10	1 NE	24.0	n ☉	29	7.30	700	12.8	10	-	10.5
"	29	-	-	-	-	-	-	a ☉	30	7.00	699	15.4	6	1 NE	10.4
"	30	19.00	695	17.8	0	0 -	26.2	-	1	6.30	703	9.2	10	0 E	8.5
"	1	-	-	-	-	-	-	n-p ☉	2	6.15	707	10.3	9	0 -	8.7
"	2	-	-	-	-	-	-	-	3	-	-	-	-	-	-
"	3	19.00	702	15.8	0	0 -	-	-	4	6.30	703	11.4	0	1 NE	7.2
Khoghuntche	4	-	-	-	-	-	-	-	5	6.50	707	12.1	10	3 WNW	-
Kan	5	18.30	704	14.1	3	1 S	-	n ☉	6	6.30	705	9.0	3	1 NNE	3.0
"	6	18.40	702	15.4	6	1 SW	-	-	7	6.10	702	11.5	7	1 E	9.2
c. Tchaptchal	7	18.30	615	7.5	10	1 NE	-	p ☉	8	6.30	617	3.7	10	2 SE	3.4
Tchaptchal da-	-	-	-	-	-	-	-	Hyps.	8	-	551	13.3	-	-	-
c. Bugra .. (wan	8	21.00	606	5.3	2	1 NNW	-	n-p ☉	9	6.10	606	3.7	1	1 N	1.5
Kura	9	18.30	605	8.6	5	1 ENE	-	p 2W ☉	10	6.30	603	4.9	0	0 -	-0.9
"	10	"	602	9.6	7	3 N	21.1	1)	11	"	608	-2.5	2	2 W	-5.0
c. Khargontu	11	"	603	4.5	2	1 N	-	* 1)	12	"	606	0.4	10	1 N	0.4
c. Gilan	12	19.00	625	7.2	1	1 W	-	☉ * 1)	13	"	624	3.4	0	0 -	-5.8
c. Kharosun	13	19.45	619	3.7	0	2 SE	-	-	14	"	619	9.5	1	0 -	-5.3
c. Aghias	14	18.30	586	13.7	7	2 SSW	-	-	15	"	590	7.4	6	1 SSW	3.1
c. Ketsu-su	15	19.00	591	15.5	10	2 WNW	-	-	16	"	593	8.5	1	1 E	5.3
c. Shartek	16	20.00	578	10.3	10	4 SW	-	p ☉	17	"	576	9.1	-	2 ENE	5.4
c. Khaptkhou-su	17	19.00	575	5.0	10	1 SSE	-	d-p ☉	18	12.00	574	8.6	10	2 NW	-0.3
"	18	20.00	576	3.5	10	3 NNW	-	☉ N ¹)	19	12.30	576	16.4	3	3 N	-0.5
"	19	18.30	575	5.9	0	1 S	16.7	-	20	6.15	574	8.6	7	1 S	-1.2
c. Onu-su	20	"	560	4.9	9	2 E	14.7	1)	21	6.00	559	2.4	0	3 S	-0.8
"	21	"	561	9.4	10	2 E	14.2	☉ E ¹)	22	6.30	559	3.3	4	2 S	0.8
"	22	18.45	560	8.6	5	1 SE	22.1	p ☉ 1)	23	6.40	559	4.5	7	2 S	0.5
"	23	18.30	566	-0.4	10	3 NW	18.3	p ▲ * 1)	24	7.10	566	1.1	9	1 NW	-5.9
c. Khaptkhou-su	24	"	581	7.8	4	2 NNW	-	1)	25	6.30	581	-1.6	0	2 ESE	-3.7
c. Ketsu-su	25	"	590	15.0	2	3 W	-	-	26	"	592	8.6	9	2 ESE	6.5
c. Aghias	26	"	607	12.5	9	2 SSE	-	p ☉	27	"	608	8.6	9	2 SSE	5.6

- 1) 10. 5. Buran-like squalls in the afternoon.
- 11. 5. Since last night a snowstorm, that ceased this morning. The whole ground is white and the clouds are hanging at the foot of the mountains.
- 12. 5. Rain since 2-3 o'clock last night, which has changed into a fall of snow that continues. At 11 a.m. the weather cleared up.
- 18. 5. Rain from 10-11 o'clock. Strong northerly wind with showers of rain during the whole day.
- 20. 5. Storm with showers of rain in the afternoon. Later the wind abated a little.
- 21. 5. Easterly storm with hail and rain at 3-4 p.m.
- 22. 5. From 12.30-2 p.m. rain with a strong wind. Squalls with rain in the afternoon.
- 23. 5. Since 3 p.m. storm with hail and snowfall. The storm abated a little in the evening.
- 24. 5. The snow lies 1 inch. deep. The fall of snow stopped during the night.

RUNAR MEINANDER

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906--1908.

Station	Evening Observations								Morning Observations						
	Day	Time	b	t	w	v	tM	Remarks	Day	Time	b	t	w	v	t _m
c. Qarasu 1907	27	19.00	622	10.5	9	2 ENE	-	p ☉	28	7.00	622	10.3	0	1 N	1.9
» May	28	19.30	-	-	10	3 SE	21.2	n, p ☉	29	6.30	620	10.0	-	-	1.7
»	29	19.00	617	15.6	4	2 E	-	-	30	»	619	9.4	1	0 -	3.7
»	30	»	615	14.2	7	1 N	24.9	-	31	»	617	9.9	0	0 -	3.7
c. Aghias	31	19.45	620	16.5	10	2 S	-	p ☉	1	6.50	622	13.5	10	0 -	6.4
c. Tsagan etc 1907	1	19.00	636	18.4	10	3 SE	-	p ☉	2	6.10	642	12.9	10	1 NE	11.0
c. Tchulak Terek	2	18.30	654	13.4	10	3 ENE	-	8-11 ☉ ☉	3	6.30	654	9.6	10	2 NE	9.1
» June	3	-	-	-	-	-	-	p ☉	4	-	-	-	-	-	-
c. Little Dshir-	4	20.30	668	17.0	5	2 S	-	-	5	7.00	671	18.5	10	1 NNW	18.0
galan	5	19.15	663	18.9	8	2 NW	-	-	6	6.40	670	16.5	8	2 SE	12.9
c. Tsatse	6	-	-	-	-	-	-	-	7	»	627	10.6	0	1 W	-
»	7	-	-	-	-	-	-	p ☉	8	-	-	-	-	-	-
»	8	18.40	622	17.2	10	0 -	28.7	p ☉	9	6.30	625	9.9	10	0 -	7.9
»	9	-	-	-	0	-	-	-	10	-	-	-	-	-	-
c. Aq Bulaq ..	10	18.20	650	15.6	9	1 N	-	-	11	5.30	654	10.1	9	0 -	8.1
c. Talde Bulaq ..	11	18.30	681	19.1	8	2 WSW	-	a ☉ ¹⁾	12	6.15	687	13.6	-	1 NE	12.2
c. Tell qara su ..	12	»	672	15.6	8	2 S	-	n ☉	13	5.35	676	11.6	8	1 SSW	11.1
c. Tai-asu	13	19.00	652	17.6	2	1 S	-	n ☉	14	6.30	652	-	3	3 NE	6.2
c. Dagin dawan	14	19.00	508	17.4	-	-	-	Hyps.	15	-	-	-	-	-	-
c. Bain Bulaq ..	15	18.40	563	7.0	6	3 E	15.1	p ▲	16	6.30	563	7.4	2	1 SE	-5.0
»	16	19.20	564	9.9	3	3 WNW	17.2	p ☉	17	»	565	5.5	5	1 NE	-4.0
»	17	18.30	566	6.4	10	4 NE	16.0	p ☉ ¹⁾	18	»	565	7.8	9	1 NE	2.6
c. Zagatyn-Chu-	18	»	563	12.6	8	2 NE	-	p ☉ ¹⁾	19	»	564	4.6	7	2 NE	1.4
zryn Kure ..	19	18.45	532	8.6	2	2 N	-	-	20	6.00	531	6.9	0	1 NW	-3.7
c. Jambe	20	»	543	10.9	5	3 N	-	-	21	5.25	544	5.9	8	2 N	-
c. Yavur Khargan	21	19.00	541	7.1	10	3 N	-	p ☉ * ¹⁾	22	6.30	543	3.9	10	1 SSE	0.0
» (usun	22	18.30	543	1.7	10	1 SE	14.0	n ☉ * ¹⁾	23	7.00	543	4.0	10	1 N	-2.1
»	23	»	544	2.1	10	1 N	-	-	24	5.30	544	-3.3	9	1 NE	-6.2
c. Iksä usun ..	24	19.25	548	3.7	10	2 NE	-	-	25	6.30	550	4.0	1	1 ENE	-5.4
c. Zagatyn Ch.	26	19.15	563	6.5	2	2 E	-	-	26	»	565	1.7	-	1 SSE	-7.0
Kure	25	18.40	562	11.2	8	2 N	-	-	27	7.30	564	11.1	9	1 SSE	0.3
c. Bain Bulaq ..	27	21.00	-	3.7	-	-	15.0	d ☉ ¹⁾	28	6.30	566	3.4	2	1 SW	-4.0
»	28	19.00	564	10.8	10	2 SSE	-	p ☉ ¹⁾	29	»	564	7.1	4	3 SW	-3.3
c. Artstan shevyr	29	19.30	561	9.1	-	-	-	-	30	»	563	8.0	3	1 NE	-2.2
c. Kharkurin she-	30	-	-	-	-	-	-	-	1	»	553	5.6	10	3 WSW	3.9
vyr	1	18.30	530	-	-	-	18.5	a ☉ p ☉	2	6.00	530	2.6	10	3 NW	1.7
c. Borgustai gorge	2	19.00	588	17.4	10	3 NW	-	a ☉ d ☉	3	»	590	12.9	10	0 -	11.4
c. Körl daw. July	3	»	632	19.1	10	3 N	-	-	4	6.30	635	15.0	4	3 NNE	14.1
c. Gultishim am-	4	-	-	-	-	-	-	-	5	»	658	22.0	0	2 ESE	16.7
na shevyr	5	19.30	664	24.7	0	0 -	-	-	6	7.00	667	21.5	0	0 -	16.4
c. Khuragin am.	6	19.00	661	23.7	0	0 -	-	-	7	6.30	661	21.6	0	0 -	16.0
c. Tsagan Tungan	7	18.30	658	26.6	0	0 -	32.0	-	8	7.00	660	22.9	10	0 -	20.1
Qarashahr	8	18.45	660	21.6	10	0 -	25.6	d ☉	9	-	-	-	-	-	-
»	9	18.30	663	20.5	7	1 W	28.9	-	10	-	-	-	-	-	-
»	10	-	-	-	-	-	-	-	11	6.30	665	17.2	0	1 E	12.1
»	11	18.50	661	21.6	0	1 E	26.7	¹⁾	12	»	661	18.0	0	1 E	14.0
»	12	-	-	-	-	-	-	-	13	-	-	-	-	-	-
Qarashar-Tawilg.	13	-	-	-	-	-	28.6	-	14	5.45	657	16.0	10	1 NNW	-
Ushak-tal	14	18.30	651	24.1	10	1 NNW	-	a ☉ p ☉	15	-	-	-	-	-	-
Qara Qizil	15	»	635	20.1	4	1 W	-	-	16	6.30	637	16.4	0	0 -	13.9

1) 11. 6. A fine drizzle in the morning. Ditto from 5.30-6 p.m.
 17. 6. Squalls with rain in the afternoon.
 18. 6. Ditto.
 21. 6. In the evening storm with rain, which later changed into a prolonged fall of snow.
 22. 6. During the night since 9 p.m. storm with rain and later fall of snow, which continues without interruption in the evening. The snow lies 0.3 m. deep.
 23. 6. The fall of snow ceased in the morning. The snow 0.33 m. deep.
 28. 6. In the evening storm and rain.
 11. 7. The sky in the evening free from clouds, but just as covered with a layer of dust.

METEOROLOGICAL NOTES

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations								Morning Observations						
	Day	Time	b	t	w	v	t _M	Remarks	Day	Time	b	t	w	v	t _m
Kumush .. 1907	16	18.05	677	27.9	0	1 E	33.5		17	-	-	-	-	-	-
Arghai Bulaq July	17	18.50	644	25.8	0	0 -	-		18	-	-	-	-	-	-
Toqsun	18	-	-	-	-	-	-		19	6.05	745	27.1	9	1 SW	23.5
"	19	18.40	744	33.3	5	3 W	37.8		20	6.00	744	27.9	3	-	33.0
"	20	17.40	744	35.5	5	3 W	39.8		21	-	-	-	-	-	-
Urumchi	26	-	-	-	-	-	-	1)	27	6.30	676	20.5	3	2 SSW	16.9
"	27	18.45	675	23.6	3	2 SW	24.6		28	"	675	19.5	0	1 SSE	15.9
"	28	18.30	-	-	-	-	33.3		29	7.00	675	18.9	8	1 SSW	17.1
"	29	"	672	21.6	9	2 NW	29.9		30	6.30	674	19.5	7	2 NE	16.7
"	30	"	-	-	-	-	23.7	p ☉°	31	6.40	675	16.0	2	1 S	12.6
"	31	"	-	-	-	-	26.7		1	6.45	676	17.2	1	2 SSW	13.9
" .. 1907	1	"	674	22.2	5	2 NW	27.0		2	6.30	674	17.6	9	2 S	14.6
" Aug.	2	"	674	21.2	9	1 N	27.5		3	"	675	17.1	7	-	15.3
"	3	18.45	674	24.4	9	3 W	29.2		4	"	679	18.3	10	1 W	17.5
"	4	18.30	-	-	-	-	24.2	n, a ☉°	5	6.45	679	18.6	2	0 -	17.6
"	5	-	-	-	-	-	-		6	"	678	18.4	1	1 SE	16.0
"	6	-	-	-	-	-	-		7	6.30	679	19.6	0	2 SSE	17.9
"	7	18.30	678	27.2	0	1 -	37.2		8	6.45	678	20.9	1	2 S	18.3
"	8	"	677	26.1	1	0 -	33.9		9	6.30	674	20.4	-	3 SE	19.0
"	9	"	678	21.7	10	1 -	24.7	p 4 W ☉°	10	"	678	17.5	6	3 NW	-
"	10	18.45	681	15.6	1	0 -	-	a-p ☉°	11	"	680	12.4	0	2 SSE	9.9
"	11	"	677	21.6	2	2 NW	26.1		12	"	678	16.1	3	1 -	-
"	12	18.50	676	24.1	1	1 NW	31.6		13	"	681	19.7	3	2 SW	17.5
"	13	18.45	674	23.5	9	3 WNW	28.5	4 W ☉° 1)	14	"	680	14.6	0	0 -	11.4
"	14	18.30	679	17.9	3	0 -	24.2		15	6.50	680	14.1	0	0 -	10.8
"	15	"	-	19.6	-	-	-		16	6.30	679	14.9	9	0 -	12.8
"	16	"	678	20.6	2	0 -	26.0		17	"	680	16.2	0	2 S	14.5
"	17	"	676	23.0	2	2 WNW	29.6		18	"	677	18.3	1	2 SE	16.1
"	18	"	678	24.6	9	3 W	30.9		19	"	676	18.0	0	2 WSW	16.6
"	19	"	672	26.5	1	2 NW	33.4		20	6.45	674	18.9	2	1 -	16.5
"	20	"	677	23.4	10	0 -	28.5		21	6.30	680	19.0	10	3 NNW	18.3
"	21	18.40	680	21.6	10	2 WNW	22.2		22	"	-	17.9	10	3 W	17.6
"	22	19.00	688	19.0	-	-	24.7		23	"	685	15.6	-	-	14.1
"	23	"	681	20.3	1	2 WNW	24.4		24	"	681	15.0	3	2 SE	12.4
"	24	"	677	20.6	-	-	27.1		25	"	677	16.4	4	2 SSE	14.6
"	25	-	-	-	-	-	-		26	-	-	-	-	-	-
Kuo Mudi	26	19.15	701	23.6	2	1 WNW	-		27	6.30	707	14.9	0	2 E	11.5
Fukang	27	19.00	708	21.2	0	0 -	-		28	6.45	708	16.5	0	1 SE	12.4
Tju jundie	28	18.30	706	17.6	1	1 N	-		29	"	708	15.6	10	0 -	9.9
Tsyni tchuenza ..	29	19.20	703	22.6	10	1 W	-		30	6.30	705	19.9	7	2 WSW	15.1
"	30	18.30	703	23.5	1	1 W	28.9		31	"	703	17.5	1	0 -	13.5
"	31	18.40	701	23.3	0	0 -	29.7		1	"	-	-	-	-	-
Santai .. 1907	1	-	-	-	-	-	-		2	"	-	-	-	-	-
Tsimusa .. Sept.	2	18.55	690	26.2	0	1 S	-		3	"	697	18.7	4	2 S	17.1
"	3	18.50	694	24.2	7	1 S	27.5		4	"	697	18.1	10	2 W	17.6
Kucheng	4	-	-	-	-	-	-	n, a ☉°	5	"	694	14.1	0	0 -	-
"	5	18.30	685	20.0	0	1 S	27.8		6	"	690	13.7	7	2 S	10.8
"	6	"	690	17.8	0	0 -	26.4		7	"	691	11.7	1	2 S	8.9
"	7	"	689	14.4	0	0 -	-		8	"	689	15.9	5	2 SSE	10.5

1) 21. 7. Post Station Pati Tshakhar: Strong north-westerly storm with showers of rain during the night.
 22. 7. The village of Davantchin: Very strong north-north-westerly storm. The day dull without rain.
 23. 7. Station Chi-chi-tsau-tzu. Heavy north-westerly storm the whole of yesterday. Mostly overcast.
 13. 8. At 8 p.m. a westerly storm with rain.

RUNAR MEINANDER

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906--1908.

Station	Evening Observations								Morning Observations						
	Day	Time	b	t	w	v	t _m	Remarks	Day	Time	b	t	w	v	t _m
Kucheng .. 1907	8	18.30	688	20.4	0	1 S	28.5		9	6.30	687	16.6	6	3 NNW	11.4
" Sept.	9	"	687	19.5	10	1 S	27.4		10	"	686	13.7	8	2 E	10.0
"	10	"	691	13.7	10	3 ENE	-	p 8°	11	"	688	13.5	10	2 SE	10.3
"	11	"	694	10.3	10	3 W	14.6	n 8°	12	"	695	9.7	10	2 S	7.0
"	12	"	695	12.5	-	-	-		13	"	695	7.6	0	1 SSW	6.1
"	13	"	695	15.1	0	0 -	22.0		14	"	696	11.1	3	2 S	6.2
"	14	"	694	16.9	0	1 W	22.5		15	"	694	9.1	0	1 S	6.0
"	15	"	691	17.5	2	0 -	25.3		16	"	694	12.2	10	- SE	11.9
"	16	"	690	15.8	3	2 S	23.0		17	"	692	8.9	0	1 E	6.7
"	17	"	691	17.2	1	1 E	27.1		18	4.45	694	10.3	1	1 S	6.5
Tyenza kai	18	"	-	13.4	8	2 SW	-		19	6.30	648	10.4	9	1 SSW	7.4
Sung shu go ..	19	"	592	8.7	10	0 -	-	1) Hyps.	20	5.45	593	4.5	9	2 W	3.7
Shiuza dawan ..	-	-	-	-	-	-	-		20	-	500	(21.0)	-	-	-
Shiuza	20	18.30	553	7.5	1	1 SE	-		21	5.30	552	2.4	-	2 NW	2.4
Yoghun Terek ..	21	19.00	612	10.9	10	3 NE	-		22	6.45	611	6.6	3	2 N	5.8
Hsia Pai-yang-ho	22	18.30	624	15.1	-	3 WNW	22.5		23	5.00	624	11.2	-	1 N	11.2
Kichik	23	"	700	20.0	0	1 NNW	27.0		24	6.30	701	15.6	0	3 NNW	15.6
Turfan	24	"	748	21.6	4	0 -	-		25	"	749	18.5	0	1 W	17.8
"	25	"	750	25.6	-	2 W	30.6	1)	26	"	752	18.9	3	0 -	17.8
"	26	"	754	18.7	3	2 NNW	27.5		27	"	758	17.5	1	3 E	13.3
"	27	"	755	18.6	5	1 N	25.8		28	-	-	-	-	-	-
"	28	"	752	18.7	0	1 W	27.6		29	6.30	754	17.0	2	1 N	14.0
Qara Khoja	29	-	-	-	-	-	-		30	"	762	15.3	1	0 -	12.6
"	30	18.30	758	21.1	0	0 -	28.5		1	-	-	-	-	-	-
Toyuk 1907	1	-	-	-	-	-	-		2	-	-	-	-	-	-
Lamjin .. Okt.	2	18.00	730	18.7	0	0 -	-		3	6.30	732	13.4	1	3 SE	11.0
Pichan	3	19.00	723	19.6	10	3 S	-		4	"	730	13.4	0	2 NE	9.6
"	4	18.30	727	16.1	0	0 -	26.4		5	4.30	-	-	-	-	6.6
Fort Chiktam ..	5	"	720	10.4	0	1 N	-		6	3.00	-	-	-	-	5.4
Yanche	6	18.15	652	-	-	-	-		7	6.30	-	6.0	2	2 NNW	0.0
Utungvotzu	7	19.00	680	15.8	0	1 W	-		8	5.00	686	8.6	10	3 W	8.6
Chin-ku-ching-tzu	8	18.30	689	6.2	3	2 E	11.0	1)	9	"	592	4.9	6	2 ENE	3.1
c. Toteshyenza	9	"	620	0.0	0	2 E	-		10	6.30	620	-5.6	1	1 E	-8.5
Tote dawan	-	-	-	-	-	-	-	Hyps.	10	-	562	(12.1)	-	-	-
Laibatchyen	10	18.30	585	-3.7	0	0 -	-		11	6.30	585	-5.0	0	0 -	-8.5
Chu-chi	11	"	619	-0.9	0	1 S	3.7		12	4.45	615	-5.3	0	1 S	-5.3
Barkul	12	19.50	622	2.6	0	0 -	-		13	6.30	626	3.5	10	1 NW	-1.1
"	13	18.30	625	5.0	10	0 -	9.5		14	"	625	-2.5	10	0 -	-4.4
"	14	"	622	3.5	0	0 -	12.2		15	"	628	2.4	10	2 W	-1.1
"	15	"	629	-0.3	9	1 W	3.5	a * 1)	16	"	627	-4.7	0	0 -	-6.1
"	16	"	625	3.7	4	2 W	7.6		17	"	627	-2.5	0	0 -	-4.0
"	17	"	626	0.6	0	1 NW	7.2		18	"	627	-3.5	9	0 -	-5.0
"	18	18.50	628	-4.0	0	0 -	3.1	p * °	19	"	626	-6.9	0	0 -	-9.6
"	19	-	624	1.2	10	3 W	6.6		20	"	626	-1.5	10	3 NW	-2.5
Ku-shui	20	18.30	615	-4.6	10	4 NW	-		21	"	616	-6.6	8	4 NNW	-7.5
Sun-shui-tang ..	21	"	596	-8.7	0	1 NE	-		22	6.00	592	-8.5	0	0 -	-9.5
Tian Shan pass ..	22	-	-	-	-	-	-	Hyps.	23	6.45	544	-9.7	0	0 -	-14.4
Nansanku	23	18.30	621	1.6	0	2 NNE	-		24	6.30	622	-1.9	0	1 NNE	-2.5
"	24	"	621	0.6	0	3 E	5.1		25	-	-	-	-	-	-

1) 19. 9. The night temperature between the 18th and 19th was probably somewhat lower. The thermometer was hanging in a yard full of animals and people.

25. 9. Short squalls in the afternoon.

8. 10. Strong buran in the night. The wind in gusts in the morning.

15. 10. A light cover of snow during the greater part of the afternoon.

METEOROLOGICAL NOTES

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations								Morning Observations						
	Day	Time	b	t	w	v	t _M	Remarks	Day	Time	b	t	w	v	t _m
Hami 1907	25	18.30	694	10.6	0	1 E	-		26	6.30	696	12.2	9	2 ENE	3.7
" .. Oct.	26	19.00	698	8.5	0	1 ENE	-		27	"	699	- 2.1	0	0 -	- 1.2
" ..	27	18.30	699	8.7	0	0 -	13.5		28	"	696	- 3.5	0	1 NE	- 1.2
" ..	28	19.00	693	8.1	0	1 N	20.6		29	"	691	3.7	0	1 E	1.5
" ..	29	"	686	8.7	0	1 NE	21.2		30	6.00	686	- 5.6	6	1 SW	4.0
Hwang-lung-Kang	30	18.30	690	7.2	0	3 NNE	-	d ☉	31	6.30	696	- 2.2	3	2 NE	- 2.5
Chang-liu-shui ..	31	"	703	0.0	2	2 NE	-		1	6.20	706	- 5.6	0	0 -	- 6.2
Yen-tun .. 1907	1	"	709	- 2.2	0	0 -	-		2	5.00	706	- 10.5	0	0 -	- 10.5
Kufi Nov.	2	-	-	-	-	-	-		3	6.30	676	- 10.0	0	2 E	- 5.9
Sha-chuan-tzu ..	3	19.00	647	- 0.8	0	2 SW	-		4	6.00	646	- 2.2	0	1 SE	- 3.1
Dawan miao	-	-	-	-	-	-	-	Hyps.	4	-	611	(6.1)	-	-	-
Hsing-Hsing-Hsia	4	19.00	615	- 1.4	0	1 SSW	-		5	6.00	614	- 10.3	0	0 -	- 11.2
Ma-lien-ching-tzu	5	18.30	620	- 4.4	0	1 WNW	-		6	"	620	- 10.1	0	0 -	- 11.2
Ta-chien-tzu ..	6	"	618	1.0	0	2 SE	-		7	6.30	620	- 5.3	0	1 E	- 6.6
Hung-liu-yuan ..	7	"	621	- 1.0	0	2 W	-		8	6.00	620	- 6.2	2	0 -	- 6.9
Pei-tun-tzu	8	"	641	2.5	1	2 SW	-		9	5.45	641	0.6	7	0 -	- 0.6
Ansi ..	9	18.45	662	4.7	0	0 -	-		10	6.30	659	1.5	5	3 W	- 0.3
" ..	10	18.30	656	9.1	0	0 -	17.6		11	"	657	- 0.3	-	2 W	- 5.1
" ..	11	-	-	-	-	-	-		12	-	-	-	-	-	-
Kua-chou-ku ..	12	18.30	665	4.4	2	2 WNW	-		13	6.00	659	- 2.2	4	3 ENE	- 3.3
Tien-shui-chingt.	13	"	666	3.7	7	2 WSW	-	p 4 W	14	5.45	669	1.0	10	0 -	0.3
Kua-tien-tzu ...	14	"	666	2.8	8	1 NW	-		15	6.30	664	- 4.7	-	-	- 5.1
Tun-huang	15	"	660	1.0	0	1 NNW	-		16	"	660	- 5.3	0	3 ENE	- 6.1
" ..	16	"	662	- 3.7	10	3 ENE	- 1.5		17	"	666	- 5.3	10	2 NNW	- 7.2
" ..	17	"	666	- 6.2	0	1 S	- 0.3		18	"	668	- 8.3	6	0 -	- 9.0
" ..	18	"	669	- 6.2	6	1 N	-		19	5.00	668	-	-	1 E	- 3.5
Kua-ti n-tzu ..	19	19.30	665	- 11.1	6	3 NE	-	p *	20	6.15	663	- 10.1	4	3 NE	- 13.9
Kbadsjuku-tzu ..	20	18.45	658	- 5.1	10	3 ESE	-	p *	21	6.30	660	- 6.4	10	4 ENE	- 6.5
Ansi ..	21	19.00	667	- 7.8	10	2 NE	- 2.9	* 1)	22	"	669	- 13.7	0	3 E	- 14.4
" ..	22	18.30	666	- 18.9	0	3 E	-		23	5.15	667	- 21.9	0	3 NE	- 21.9
Hsiao-Wan ..	23	20.00	657	- 23.7	0	2 E	-		24	6.30	656	- 24.4	0	2 SE	- 25.6
Pu-lung-chi	24	21.15	645	- 15.0	2	2 SE	-		25	"	643	- 12.8	1	3 SE	- 16.2
San-tao-kow	25	18.40	640	- 10.3	1	2 SE	-		26	6.40	638	- 12.2	0	1 SE	- 17.5
Yumen hsien ..	26	"	638	- 12.8	0	1 SE	- 3.7		27	4.20	639	- 16.5	0	2 NW	- 18.4
" ..	27	19.15	634	- 15.3	0	1 SE	-		28	5.00	634	- 16.2	3	0 -	- 17.2
Chih-chin-hsia ..	28	-	-	-	-	-	-		29	6.30	610	-	4	2 W	-
Hui-hui-pao	29	-	-	-	-	-	-		30	"	620	- 13.5	0	2 NW	-
Chia-yu-kuan ...	30	18.45	621	- 10.3	0	2 E	- 5.3		1	"	622	- 9.4	0	3 NW	- 12.9
" ..	1	18.35	646	- 8.1	0	0 -	-		2	"	646	- 11.2	0	0 -	- 12.9
Suchow .. 1907	2	18.30	642	- 8.7	0	0 -	- 1.5		3	"	639	- 11.0	3	2 SSE	- 12.1
" .. Dec.	3	18.50	639	- 8.9	0	2 SE	- 1.6		4	"	639	- 9.4	1	1 SE	- 12.2
" ..	4	18.30	639	- 8.7	0	0 -	2.2		5	6.50	638	- 11.0	1	0 -	- 11.9
" ..	5	"	635	- 5.0	0	1 E	- 0.4		6	6.30	638	- 6.7	3	1 SE	- 8.5
" ..	6	22.00	634	-	0	0 -	2.1		7	"	633	- 7.2	4	2 NNW	- 8.9
" ..	7	19.15	639	- 2.5	10	2 NE	0.3		8	7.00	641	- 6.7	10	2 NNE	- 7.0
" ..	8	18.30	646	- 8.5	0	0 -	- 3.7	n-d *	9	6.30	646	- 14.7	0	1 NW	- 15.6
" ..	9	"	654	- 10.4	0	0 -	-		10	"	655	- 15.5	1	0 -	- 16.2
Ning shui ..	10	19.00	663	- 4.4	5	3 W	-		11	"	660	- 10.6	0	2 ESE	- 11.6
Chinta ..	11	"	655	- 2.0	0	0 -	-		12	"	653	- 4.4	0	2 NW	- 6.2
" ..	12	18.30	654	- 2.0	3	1 E	-	p 3-4 NW	13	"	656	- 2.5	0	2 SE	- 4.5

1) 21. 11. During the night fall of snow and strong wind. In the afternoon fall of snow and strong wind. Snow 4-5 cm. deep.

RUNAR MEINANDER

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906--1908.

Station	Evening Observations								Morning Observations											
	Day	Time	b	t	w	v	t _M	Remarks	Day	Time	b	t	w	v	t _m					
Shuang-ching-tzu	1907	13	18.30	647	-4.6	0	1	NW	-	p 3	SE	14	6.30	645	-8.0	1	0	-	-8.7	
Ma-chuang-tzu	Dec.	14	"	644	-1.4	4	0	-	-			15	"	646	-1.9	3	1	W	-3.6	
"	"	15	"	646	4.4	6	1	S	12.5			16	"	647	-0.3	4	1	E	-0.3	
"	"	16	"	-	-	-	-	-	-			17	"	-	-	-	-	-	-	
Kao-tai	"	17	18.30	659	-1.1	8	2	E	-	*	1)	18	6.30	654	-6.2	4	0	-	-7.1	
Sha-ho-Kou	"	18	"	-	-	-	-	-	-			19	"	-	-	-	-	-	-	
Kanchow	"	19	18.30	644	-1.6	0	1	N	-	p 3	NW	20	6.30	643	-6.0	0	2	E	-6.0	
"	"	20	"	-	-	-	-	-	-			21	"	642	-4.7	0	1	SE	-4.7	
"	"	21	"	639	-4.4	0	0	-	17.5			22	"	637	-4.6	0	0	-	-5.1	
"	"	22	19.00	635	-5.1	0	0	-	21.4			23	"	633	-4.9	0	1	SSW	-	
"	"	23	"	632	-5.3	0	1	SE	16.9			24	"	630	-2.9	0	2	E	-5.0	
Kan-chun-pao	"	24	18.30	629	-0.6	10	2	SW	-			25	6.45	628	-3.7	0	1	N	-4.1	
"	"	25	"	630	1.2	0	0	-	8.5			26	6.30	627	0.0	-	2	WSW	-2.0	
Kanglungsu	"	26	18.30	551	-2.5	0	0	-	-			27	"	550	-8.5	0	1	S	-8.5	
"	"	27	18.50	551	-1.2	0	0	-	-			28	"	550	-4.7	0	0	-	-5.3	
"	"	28	18.30	548	-0.4	0	0	-	-			29	"	548	-4.2	0	0	-	-4.2	
c. Kludjek gol	"	29	"	547	-4.5	0	1	SW	-			30	"	547	-7.5	1	1	SW	-8.6	
"	"	30	"	551	-3.9	4	1	NE	2.2			31	"	551	-8.5	3	1	W	-8.5	
"	"	31	19.30	550	-6.1	0	1	SW	2.6			1	"	549	-4.9	0	1	SW	-6.4	
Li Yuan	1908	1	18.30	551	-5.8	0	2	SW	10.6			2	"	549	-6.9	0	2	WSW	-7.1	
Kanchow	Jan.	2	"	617	-1.5	0	1	NNE	-			3	"	616	0.3	0	1	S	-0.6	
"	"	3	"	639	8.5	0	1	W	-			4	"	637	-6.0	0	0	-	-6.0	
"	"	4	"	640	2.2	0	2	S	5.1	p 3	N	5	"	641	-3.6	0	1	NW	-3.6	
"	"	5	"	641	2.5	0	2	W	6.5			6	"	642	-5.6	0	0	-	-5.6	
"	"	6	"	641	2.0	2	1	W	4.4			7	"	637	-3.6	0	1	E	-3.6	
Tung lo	"	7	"	626	2.9	0	1	N	-			8	"	625	-1.1	0	3	NE	-1.6	
Hsin Kou	"	8	"	599	6.2	0	2	SW	-			9	"	597	-1.1	0	3	SW	-4.9	
Hsyta-chuang	"	9	"	-	-	-	-	-	-			10	"	588	1.0	0	2	SW	-	
Chintchia miao	"	10	18.30	552	1.1	5	2	SE	-			11	"	554	-2.5	0	2	SW	-4.1	
Shui-Chuan-tzu	"	11	"	574	5.0	0	2	N	-			12	"	574	0.3	3	2	N	-1.1	
Yung Chang	"	12	"	596	2.2	2	0	-	-	d 3	E	13	"	596	-2.5	8	0	-	-3.6	
Fyn lo pu	"	13	"	618	-	8	1	E	-	d 3	E	14	"	619	-	8	0	-	-	
Lianchow	"	14	"	632	-2.0	0	1	ESE	-	p 3	N	15	"	630	-7.0	-	1	S	-7.0	
"	"	15	"	629	1.5	9	0	-	11.0			16	"	627	-6.0	1	1	S	-6.0	
"	"	16	"	625	2.8	0	1	SSE	11.0			17	"	624	-4.4	-	0	-	-5.3	
"	"	17	"	622	3.7	8	3	SW	13.5			18	"	622	-1.0	10	0	-	-1.0	
"	"	18	"	623	1.2	0	0	-	-			19	"	628	2.8	0	1	S	-2.8	
"	"	19	"	634	-5.0	0	1	NE	-	n *	1)	20	"	634	-12.2	5	0	-	-12.2	
"	"	20	"	635	-6.1	0	0	-	1.5			21	"	633	-11.7	1	1	S	-13.6	
"	"	21	"	632	-2.6	0	2	NE	3.6			22	"	630	-10.1	3	1	S	-10.1	
Ching pien yi	"	22	"	608	-4.4	0	1	SW	-			23	"	608	-10.0	3	2	SSW	-10.0	
Kulang	"	23	"	587	-5.6	-	2	NW	-			24	"	589	-6.9	4	1	NW	-6.9	
Lung kowpu	"	24	"	566	-5.6	10	2	S	-	*	0	1)	25	"	565	-12.9	4	2	W	-12.9
Ushaoling pass	"	-	"	-	-	-	-	-	-	Hyps.		25	"	522	(8.3)	-	-	-	-	
Ta-chaikow	"	25	18.30	559	-11.0	0	0	-	-	n *		26	6.30	558	-17.2	2	0	-	-17.8	
Ping fan	"	26	"	588	-3.1	0	1	W	-			27	"	589	-6.5	10	0	-	-8.1	
Hung-cheng-tzu	"	27	"	609	0.8	2	0	-	-			28	"	608	-7.8	9	0	-	-8.5	
Ydiava	"	28	"	613	-1.9	10	2	SW	-			29	5.30	613	-7.6	9	0	-	-7.6	
"	"	29	"	-	-	-	-	-	-			30	"	-	-	-	-	-	-	

1) 17. 12. Since yesterday night a light fall of snow with a north-westerly wind. Ceased about 3-4 p.m.
 19. 1. Snow 1 cm deep in the morning.
 24. 1. From 12-2 p.m. quite a light fall of snow, again about 5 p.m.

METEOROLOGICAL NOTES

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations								Morning Observations							
	Day	Time	b	t	w	v	t _M	Remarks	Day	Time	b	t	w	v	t _m	
Lanchow .. 1908	30	19.40	624	-2.9	0	0	-	-	31	6.30	626	-5.1	8	0	-	-5.6
" .. Jan.	31	18.30	625	0.0	0	0	-	1.9	1	"	628	-2.0	10	0	-	-4.4
" .. 1908	1	"	626	1.4	0	0	-	2.5	2	"	625	-3.6	10	1	N	-4.7
" .. Febr.	2	"	629	-1.2	10	1	S	6.2 p * ¹⁾	3	"	631	-5.0	10	2	N	-5.0
" ..	3	"	-	-3.1	10	0	-	-0.8 n, a * ¹⁾	4	"	635	-6.5	10	0	-	-7.2
" ..	4	"	634	-3.0	10	1	S	-	5	"	636	-7.2	10	2	S	-8.3
" ..	5	"	634	-3.9	0	0	-	-2.0	6	"	635	-7.6	10	1	N	-7.6
" ..	6	"	628	-1.0	2	0	-	0.4	7	"	628	-6.1	10	1	W	-7.1
" ..	7	"	631	-1.1	8	2	SE	0.1	8	6.45	632	-6.6	0	2	NNE	-6.6
" ..	8	19.30	629	-1.2	0	1	NNE	1.7	9	6.30	629	-5.8	0	0	-	-5.8
" ..	9	18.30	628	1.7	7	2	E	-	10	"	632	-5.0	10	1	N	-5.8
" ..	10	"	633	-2.5	8	0	-	1.2	11	"	631	-5.8	10	2	N	-7.9
" ..	11	"	631	-1.2	0	0	-	3.1	12	"	633	-5.9	10	1	N	-7.8
" ..	12	"	633	-1.0	1	2	N	4.4	13	"	635	-4.7	10	1	S	-5.0
" ..	13	"	632	-3.5	0	0	-	1.9 a *	14	"	633	-6.2	9	1	N	-8.0
" ..	14	"	632	-2.6	7	0	-	3.7	15	"	633	-4.6	10	0	-	-5.4
" ..	15	"	634	-2.8	10	2	S	3.5 a * p * ^o	16	"	632	-6.0	10	0	-	-6.0
" ..	16	"	635	-3.0	7	0	-	1.9	17	"	639	-12.5	0	1	N	-13.1
" ..	17	"	634	-6.0	0	1	S	-2.5	18	"	631	-12.1	1	0	-	-12.6
" ..	18	"	628	-2.9	0	0	-	-0.4	19	"	628	-9.5	3	2	N	-9.7
" ..	19	"	630	0.3	10	0	-	4.6	20	"	633	-3.1	10	1	N	-3.1
" ..	20	-	-	-	-	-	-	-	21	"	631	-5.0	10	0	-	-5.0
" ..	21	"	628	-0.5	0	0	-	5.6	22	"	629	-3.9	10	2	S	-3.9
" ..	22	"	631	1.9	-	-	-	6.0	23	"	631	-4.4	10	2	S	-4.4
" ..	23	"	628	0.0	0	1	E	5.4	24	"	630	-5.0	10	2	S	-5.0
" ..	24	"	627	2.2	0	0	-	6.1	25	"	628	-7.0	0	1	S	-7.0
" ..	25	"	622	2.6	0	2	N	6.5	26	"	623	-1.4	8	2	S	-1.4
" ..	26	"	629	3.5	4	0	-	11.1	27	"	626	-3.1	0	1	N	-3.3
" ..	27	"	627	5.6	10	2	S	6.2	28	"	631	-1.0	10	2	N	-
" ..	28	"	630	1.0	10	2	S	5.6 a * ^o	29	"	628	-2.2	10	0	-	-2.2
" ..	29	"	630	-1.2	10	2	N	5.6	1	"	631	-5.3	10	1	W	-5.3
" .. 1908	1	"	623	0.0	10	2	SE	2.4	2	"	621	-2.5	10	0	-	-2.5
March	2	"	625	-1.2	2	0	-	5.0 a *	3	"	627	-3.7	10	0	-	-4.4
" ..	3	"	626	-0.6	0	1	SE	3.7	4	"	625	-4.5	10	2	NE	-4.6
" ..	4	-	-	-	-	-	-	-	5	"	627	-2.8	10	0	-	-2.9
" ..	5	"	629	-1.9	10	1	E	2.5 a * ^o	6	"	631	-5.0	10	1	SW	-5.1
" ..	6	"	633	-5.0	0	2	SW	1.4 a * ^o	7	"	629	-8.6	10	1	SW	-9.4
" ..	7	"	626	-3.7	10	1	S	-1.2 p * ¹⁾	8	"	629	-5.0	10	0	-	-5.0
" ..	8	"	633	-3.7	10	2	NW	1.6 * ¹⁾	9	"	637	-6.6	10	0	-	-6.7
" ..	9	"	636	-4.7	0	0	-	0.6 * ¹⁾	10	"	634	-8.6	10	0	-	-8.9
" ..	10	"	-	-	-	-	-	-	11	"	635	-6.9	8	0	-	-7.5
" ..	11	"	634	-1.0	0	0	-	6.2 p (☉) ¹⁾	12	"	634	-3.7	10	0	-	-4.5
" ..	12	"	634	1.2	5	0	-	8.5	13	"	633	-3.1	10	0	-	-3.7
" ..	13	"	631	0.0	0	0	-	7.1	14	"	632	-3.5	10	0	-	-4.4
" ..	14	"	628	1.2	0	0	-	8.1	15	"	628	-5.3	0	0	-	-6.2
" ..	15	-	-	-	-	-	-	-	16	"	633	-3.6	1	0	-	-4.4
" ..	16	"	633	3.7	0	0	-	10.0	17	"	633	-	10	0	-	-
Tianshan-tzu ...	-	-	-	-	-	-	-	Hyps.	17	-	560	(14.0)	-	-	-	-
Kut'an	17	"	556	0.0	10	3	NE	- p * ^o	18	"	557	-5.0	10	1	NE	-5.6
Tang wang	18	"	619	3.7	10	1	NNW	- n, a *	19	"	623	-3.1	0	0	-	-3.1

- 1) 2. 2. The snow covers the ground 1/2 finger deep.
- 3. 2. The snow 1 1/2 fingers deep.
- 7. 3. Heavy fall of snow.
- 8. 3. The fall of snow ceased about 6 p.m. Snow 3-4 cm deep.
- 9. 3. The snow melted.
- 11. 3. For the first time for many days a sunny afternoon.

RUNAR MEINANDER

Table 3. Summary of the Meteorological Notes during the Expedition through Central Asia in the Years 1906—1908.

Station	Evening Observations								Morning Observations						
	Day	Time	b	t	w	v	t _m	Remarks	Day	Time	b	t	w	v	t _m
Sonanpa 1908	19	18.30	573	-2.2	0	1 SW	-		20	6.30	573	-1.9	0	0 -	-6.1
Hochow . March	20	»	606	10.1	0	2 WNW	-		21	»	-	-	-	-	-
»	21	»	601	13.7	0	2 NE	25.0		22	»	600	0.6	1	0 -	-1.0
Shui-tan-pu	22	»	581	6.9	10	3 NW	-		23	»	585	1.2	10	0 -	-0.4
Tchogu	23	»	570	6.9	10	2 NE	-		24	»	569	1.5	10	1 E	-1.9
Sasuma	24	»	557	2.2	10	2 SSE	-		25	»	558	-2.5	0	3 SW	-
Labrang monas- »	25	»	-	-	-	-	-		26	»	531	-2.5	7	2 E	-5.6
»	26	»	532	5.0	0	1 W	-		27	»	534	-5.0	0	1 W	-8.1
»	27	19.30	532	8.1	0	0 -	14.2		28	»	532	0.0	1	1 E	-1.0
Tuolungtu	28	18.30	535	8.4	0	2 SW	-		29	5.30	537	-5.6	0	0 -	-5.6
Latsa tinga pass	-	-	-	-	-	-	-	Hyps.	29	-	482	(8.7)	-	-	-
Kadia monastery	29	»	540	9.9	0	0 -	-		30	6.30	540	-1.2	0	0 -	-
Vankur	30	»	510	5.1	10	1 S	-		31	»	-	0.0	10	0 -	-0.9
Sin-cheng	31	»	538	12.8	10	3 N	-		1	»	539	2.5	0	0 -	2.5
Taochow .. 1908	1	»	538	11.2	10	2 S	-	p ☉	2	»	539	7.5	10	0 -	6.1
» .. April	2	»	540	3.6	10	2 W	9.1	☉ * ¹)	3	»	542	-1.5	10	1 S	-2.2
Hsi-ta	3	»	563	6.2	10	2 E	-	* ¹)	4	»	560	5.0	10	0 -	2.8
Minchow	4	»	566	11.0	0	2 W	-		5	»	568	5.5	10	0 -	5.5
»	5	»	568	8.7	10	3 W	16.6		6	»	568	-	10	1 E	5.0
»	6	»	568	9.6	10	1 W	11.2	p ☉	7	6.15	570	-	10	1 SE	5.6
Laotien	7	»	541	-	10	3 NE	-		8	5.30	537	-	10	3 W	-
Muzeiling pass	-	-	-	-	-	-	-	Hyps.	8	-	508	(12.5)	-	-	-
Hsien-tien-tzu	8	»	572	-	10	1 N	-	p ☉	9	6.30	571	-	10	1 SW	-
Chang-hsien	9	»	596	-	10	0 -	-		10	»	596	-	10	0 -	-
Tyngtja myng	10	»	615	-	10	0 -	-	p ☉	11	»	621	-	8	0 -	-
Liohmen	11	»	638	-	10	0 -	-	n ☉ p ⁽¹⁾)	12	»	639	-	8	0 -	-
Kuan-tzu cheng	12	»	631	-	4	0 -	-	p ☉ 3 S ¹)	13	»	631	-	10	0 -	-
Tsinchow	13	»	654	-	4	0 -	-	p ☉	14	»	654	-	10	0 -	-
»	14	»	655	-	10	0 -	-	p ☉	15	»	659	-	8	0 -	-
»	15	»	654	-	1	0 -	-	p ☉	16	»	657	-	2	0 -	-
Shuitang Ching	16	»	662	-	10	2 NE	-	p ☉	17	»	664	-	3	0 -	-
Tsingshui	17	»	639	-	4	1 E	-	p ☉ ¹)	18	»	639	-	0	0 -	-
Panlung pu	18	»	590	-	10	2 SE	-		19	»	592	-	10	0 -	-
Chiao chow-pu	19	»	625	-	10	0 -	-	☉ ¹)	20	»	627	-	0	0 -	-
Lungchow	20	»	681	-	0	0 -	-		21	»	679	-	0	0 -	-
Cheng-ngang	21	»	691	-	3	0 -	-		22	»	691	-	0	0 -	-
»	22	»	684	-	0	1 E	-		23	»	685	-	9	0 -	-
Feng-siang-fu	23	»	681	-	0	0 -	-		24	»	693	-	10	2 W	-
Famyng sy	24	»	709	-	8	0 -	-	a, d ☉	25	»	706	-	3	0 -	-
Tsiang chow	25	»	703	-	0	0 -	-		26	»	703	-	9	1 S	-
Li-tsui-an	26	»	710	-	1	1 S	-		27	»	710	-	-	-	-
Si-an-fu	27	»	719	-	0	0 -	-		28	»	-	-	-	-	-
»	28	»	720	-	10	0 -	-	p ☉	29	»	722	-	8	1 W	-
»	29	»	720	-	10	0 -	-	p ☉ ¹)	30	»	721	-	0	2 E	-
»	30	»	727	-	10	3 E	-	p ☉ ¹)	1	»	735	-	0	2 E	-
» .. 1908	1	»	728	-	0	0 -	-	n ☉ ⁴)	2	»	727	-	0	0 -	-
» .. May	2	»	725	11.1	10	1 W	-		3	»	725	8.9	0	0 -	7.5
»	3	20.30	722	13.7	0	0 -	21.2		4	»	722	11.6	0	1 E	7.5
»	4	18.30	715	19.7	0	0 -	27.2		5	»	-	-	-	-	-
»	5	»	-	-	-	-	-		6	»	716	15.3	0	0 -	11.7

- 1) 2. 4. Rain since about 3-4 p.m., at times heavier, at times ceased. Changed into fall of snow later in the evening.
3. 4. Still snowing. The snow lies 2-3 cm deep.
11. 4. Heavy rain during the night. A little sunshine in the afternoon.
12. 4. In the afternoon sunshine with scattered clouds and a strong southerly wind.
17. 4. The afternoon sunny. About 4 p.m. a squall of rain of short duration.
19. 4. Passing showers of rain during the whole day.
29. 4. Sun at times in the afternoon.
30. 4. The afternoon dull and windy. Since 6.30 p.m. rain with a strong wind.
1. 5. Rain and heavy storm during the night.

RUNAR MEINANDER

S U P P L E M E N T T O T A B L E 3

1908

June 18	Tai-yuan-fu	Slight rain at times in the afternoon.
19	»	ditto
20	»	Frequently recurring showers of rain during the whole night and day.
21	Hwangtu chai	—
22	Chih-tsung	—
23	Yutai hsien	—
24	» »	Very little rain yesterday evening, last night and this morning.
25	» »	Dull weather in the morning and in the early afternoon.
26	» »	Thunder and rain of short duration in the afternoon.
27	» »	Rain at night and in the morning.
28	Mukatsun	Thunder and rain of short duration in the evening.
29	Yung nan yu	Rain during the whole afternoon.
30	Ta yu kou	Buran and passing rain in the afternoon.
July 1	Tintachia	—
2	Soping	Very little rain yesterday afternoon.
3	Jankou jouza	A cold and grey day, yet without rain.
4	Kweihwa ting	Heavy thunder-rain in the afternoon.
5	» »	—
6	» »	—
7	» »	Heavy rain of short duration and thunder in the evening.
8	» »	Heavy rain several times in the afternoon.
9	» »	Thunder and showers of rain in the morning and during the whole afternoon.
10	Kulishang	Thunder far off in the afternoon. A sunny and warm day.
11	»	—
12	Suchi	—
13	Tinködaliang	Thunder-rain in the evening.
14	Tatung-fu	Rain during the whole afternoon. Thunder at times.
15	» »	Prolonged rain in the morning, passing showers in the afternoon.
16	Vanguartschung	A fine and sunny, although cloudy afternoon.
17	Tientschen hsien	The day cloudy, but fine.
18	»	Pouring rain the whole day until 2 o'clock in the night.

C G. MANNERHEIM'S MAPPING WORK

ON HIS JOURNEY ACROSS ASIA
IN 1906—1908

BY

A. K. MERISUO

The route mapping done by Baron MANNERHEIM on his long Asiatic journey represents a great deal of work even in the form of field work. In addition to his numerous other researches he had constantly to find sufficient time for mapping the route. It was necessary to keep constant note of the distance covered and to observe the country traversed, while everything measured, seen and observed had to be entered on the map and taken note of. With great conscientiousness careful and precise notes were made of all the interesting and important features of the route, often, indeed, far removed from the road.

Subsequently these maps were subjected to detailed and laborious revision. MANNERHEIM, by himself and in collaboration with others, made clean drafts of a large part of the original route, but part of the material remained untouched in its rough state. — The atlas published in the present volume is based on these materials, either more or less revised or else left unrevised.

When the atlas was planned and I was entrusted with the task of preparing it, I had at my disposal materials that consisted principally of route materials at three separate stages, viz., those of which MANNERHEIM himself had made a clean draft, those completed by someone else in Warsaw, and finally the routes in their original stage of field work. The first category was suitable for publication almost as it stood; the maps drawn in Warsaw were deficient or lacking in nomenclature; the rest of the materials required a good deal of revision.

The original route maps and those, of which clean drafts had been made, were drawn on a scale of 1 : 84,000. In his field work MANNERHEIM used either loose cardboard sheets of 17.5 × 24.5 cm or mapping books bound in linen, the sheets of which were 10.5 × 17.5 cm in size. Both the cardboard sheets and the paper in the mapping books were divided by blue lines into square versts, which facilitated the insertion of distances and proportions on the map. During the first part of the journey the following stages were mapped on cardboard: Khotan — Karghalik, Maral Bashi — Uch Turfan, Bashagma — Aqsu darya, Aqsu — Qulja, Gilan — Qarashahr and Urumchi — Kucheng. The mapping books were used during the middle and final parts of the mapping. The routes of the following stages were drawn in them: Kucheng — Turfan, Chin-ku-ching-tzu — Barkul, Hami — Ikoshuor, Ning shui — Shuang-ching-tzu, Kanchow — Gandjenpu — Kanglungsu — Gandjenpu —

Kanchow, Lanchow — Labrang — Ning yuan, Tsinchow — Cheng-ngang and the results obtained by field measurements and sketches for making plans of numerous towns.

Of the stages Khotan — Karghalik, Maral Bashi — Uch Turfan and Bashagma — Aqsudarya MANNERHEIM subsequently drew clean pencilled maps on larger sheets of paper, 35 × 44 cm in size, of which there are 15 altogether. The route on these is provided with names, descriptions and fairly extensive explanatory notes in the corner. — Of the stages Gilan — Qarashahr, Lanchow — Labrang — Ning yuan and Tsinchow — Cheng-ngang he made clean drafts in Warsaw. The work was done with Indian ink on large cardboard sheets, 32.5 × 47.5 cm, divided by blue lines into square versts. In all there were 29 sheets of these stages on a scale of 1 : 84,000. The route itself is sufficiently indicated on them, but the wording is either deficient or entirely lacking.

Of the plans of the towns MANNERHEIM also made clean pencilled copies subsequently in most cases, providing them with names, descriptions and long detailed notes. They are drawn on cardboard, 25 × 28 cm in size, divided by blue lines into square versts on a scale of 1 : 42,000.

When it was decided to include the plans of the towns in the first volume of the work, the Record of the Journey, MANNERHEIM's clean drafts were enlarged by pantograph to a scale of 1 : 21,000. When they were then reduced by photography to about half, they were almost their original size. Attempts were made to engrave these very beautifully drawn plans of MANNERHEIM's for the purpose of preparing blocks, so that their appearance should be preserved. The writing of names and descriptions had, however, to be replaced by printing and a new scale of lines had to be drawn. There are 18 plans in all and they will be found in the first volume.

The making of the actual atlas required some preparatory work. The most urgent part of it consisted of collating names and descriptions. I went through the whole of the materials, selected all the names and descriptions from them and drew up a uniform index of them, which was then translated into English. As there were a good many descriptions and the nomenclature called for treatment by experts, I had time to perform other indispensable preparatory work, while waiting for this task to be completed.

Much time was consumed in dealing with the unrevised materials of the route. The line of the route itself had first to be drawn, point by point, from the original maps. When this was done, the rest of the mapping material had to be placed and cleanly drawn on the scale and in the directions determined by this line. When all the maps had thus been given a uniform appearance, the planning of the atlas could be begun.

It was decided to print the maps in three colours and to make the sheets as detailed as possible, in order that the number of sheets should not be too large. It was agreed that clean drafts of the map sheets should be made, for technical reasons, on the original scale of 1 : 84,000, but that they should subsequently be reduced by photography to a scale of 1 : 200,000.

Some preparatory work was also involved in determining the division of the atlas into sheets and fixing the number of sheets. As the route had been drawn, for practical reasons, in short sections, these sections had first to be combined in order to obtain a general con-

ception. I therefore drew a continuous line of the route from the different parts of the journey on the scale of the original map. I then reduced this line to a scale of 1 : 1 million, so that it should be more easily comprehensible, and divided the atlas into sheets within its framework.

As it was considered desirable that the breadth of the final map sheets should not exceed the pages of the volume and as the sheets would consequently be rather small in size and their number would therefore be fairly large, a method had to be resorted to that differed slightly from what is usual. To economise space the route was divided into fairly short sections, of which the map sheets could be formed by combining several such sections. By this means it was finally possible to fit the route maps of the whole long journey into 14 sheets on a fairly large scale (1 : 200,000). To these an index sheet of approximately the same size as the others was added at the beginning of the atlas.

In explanation of the method referred to it should also be mentioned that, as only the features of the landscape lying close to the road are drawn on the itineraries and the mapping thus becomes more or less ribbon-shaped, the sheets of the atlas became more copious by the use of the method described and contained fewer blanks, while at the same time much space was saved.

The small squares on the index map (1 : 2 million), into which the different sections of the journey are further divided, do not represent the map sheets, but those framed parts of the route, already referred to, of which the map sheets are composed. These «squares» are also not uniform, their shape and size varying according to the manner, in which a sheet could best be combined from them.

The reader should not have any difficulty in connecting the sections of the journey, illustrated on a map sheet, with each other, as they are numbered consecutively with Arabic figures (1, 2, 3, etc.). The map sheets themselves are numbered with Roman figures (I, II, III etc.). By comparing the different sheets with the index map the connection between the sections of the route should be easily intelligible.

Finally, the general map (1 : 20 million) in the lower left-hand corner of the index map shows, in what way the principal mapped parts of the journey combine with each other. The towns or other places, of which plans are provided, are also marked separately on this map.

The total length of the mapped route is slightly over 3000 kilometres. Curvometrically calculated the length of the routes drawn on the different sheets is as follows: I 286 km, II 274 km, III 258 km, IV 220 km, V 186 km, VI 251 km, VII 237 km, VIII 157 km, IX 198 km, X 223 km, XI 167 km, XII 236 km, XIII 223 km, XIV 171 km, so that the total length of the route amounts to 3087 km.

Calculated in the same manner, the length of the different sections of the route are as follows: Khotan—Karghalik 286 km, Maral Bashi—Uch Turfan 274 km, Bashagma—Aqsu darya 258 km, Aqsu—Qulja 406 km, Gilan—Qarashahr 645 km, Urumchi—Kucheng 198 km, Kucheng—Turfan 123 km, Chin-ku-ching-tzu—Barkul 100 km, Hami—Ikoshuor 22 km, Ning shui—Shuang-ching-tzu 60 km, Kanchow—Gandjenpu—Kanglungsu—Gandjenpu—Kanchow about 125 km (part of the route is unmapped and the route Gandjenpu—Kan-

chow was covered in both directions), Lanchow—Labrang—Ning-yuan 459 km and Tsinchow—Cheng-ngang 171 km.

In order to preserve Fieldmarshal MANNERHEIM's great mapping work as authentic as possible, with the plastic beauty, with which it left his hands, I have constantly endeavoured, in preparing the atlas, to follow the course of his pencil faithfully. All the signs indicating rivers, land formations, woods, trees, dwelling sites, villages, towns, fortifications etc. have been left as they were. The numerous explanations, notes, calculations of altitude, width, depth and currents of rivers, numbers of houses in villages etc. have also been preserved exactly as they appear in the Fieldmarshal's notes.

As almost all the signs in the atlas are matters of general use and knowledge in cartography, and as, besides, an explanatory word or note is added in most cases, it was not considered necessary to add a page to the atlas in explanation of the various signs.

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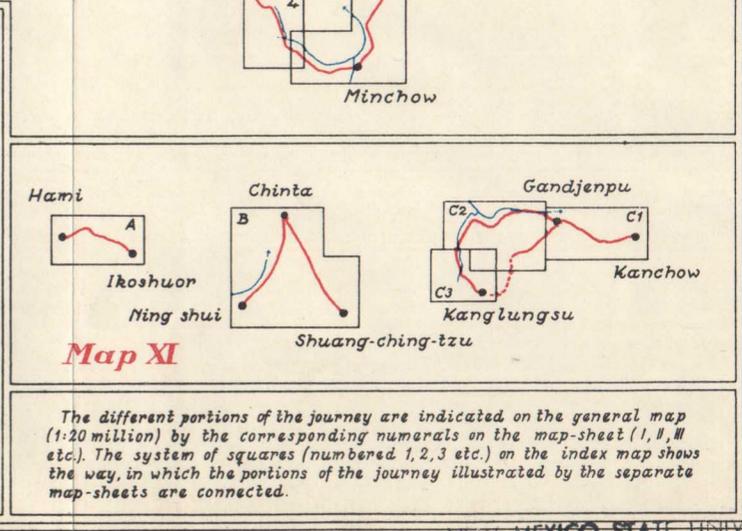
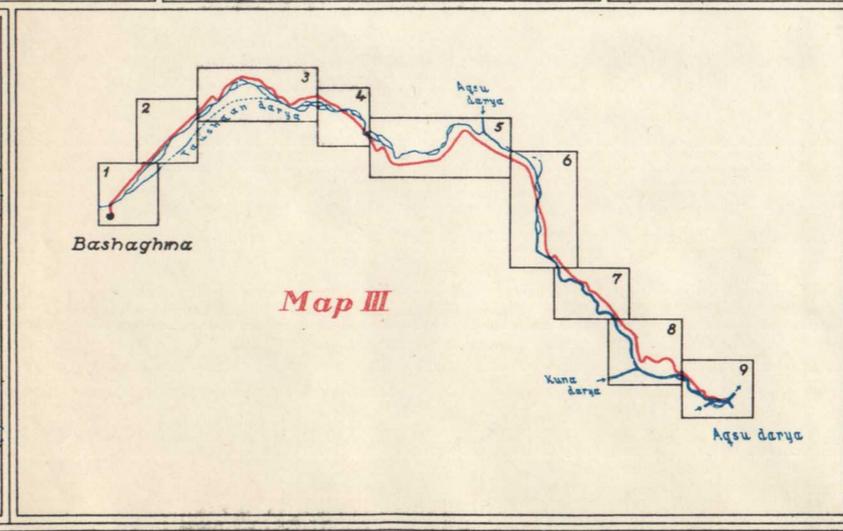
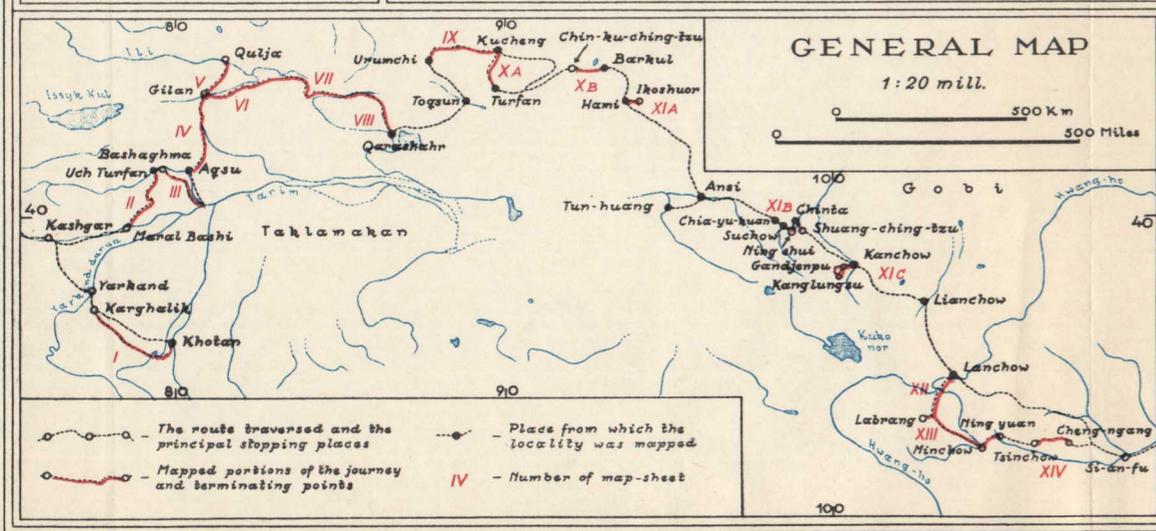
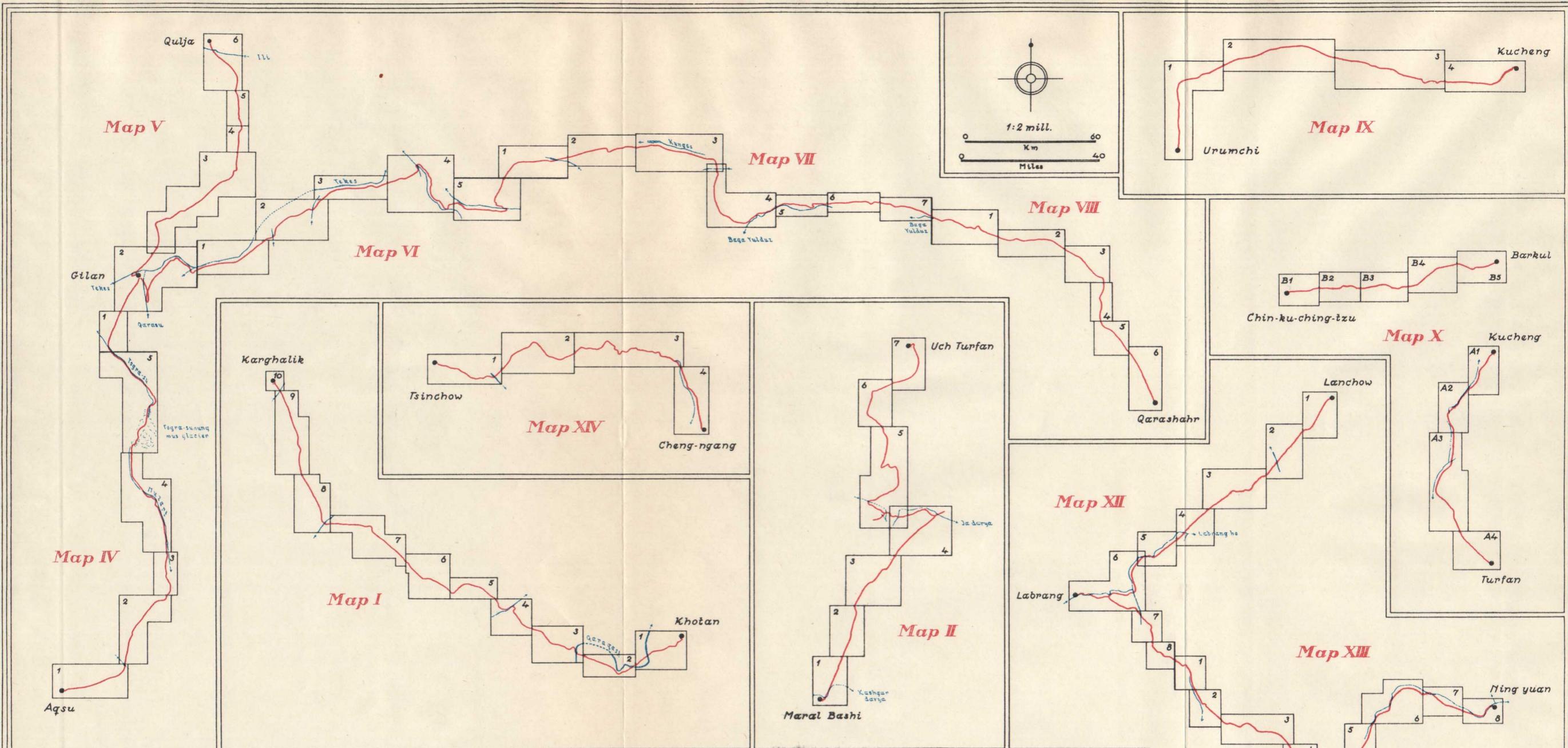
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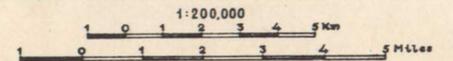
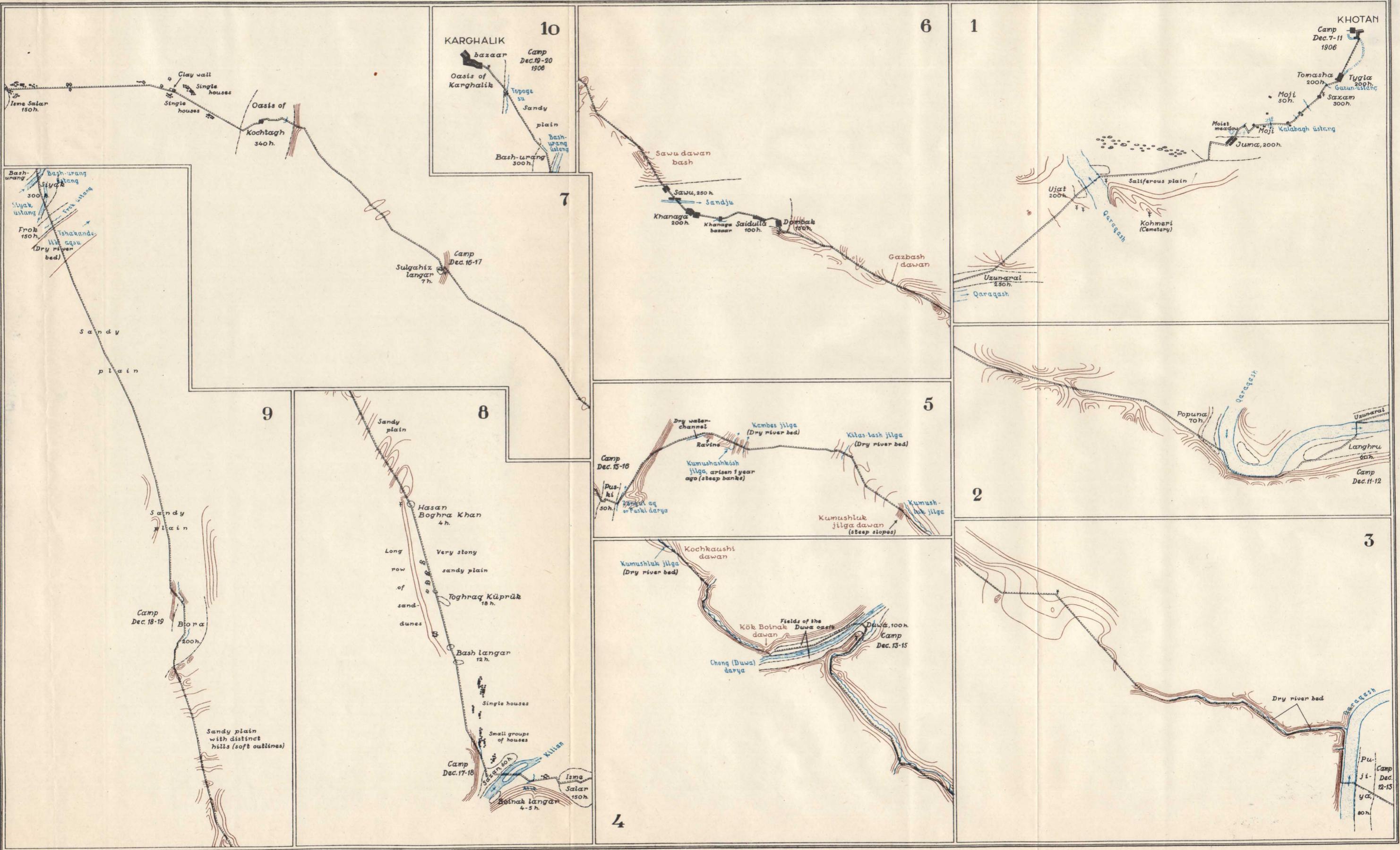
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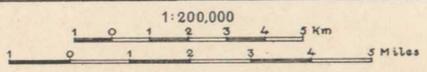
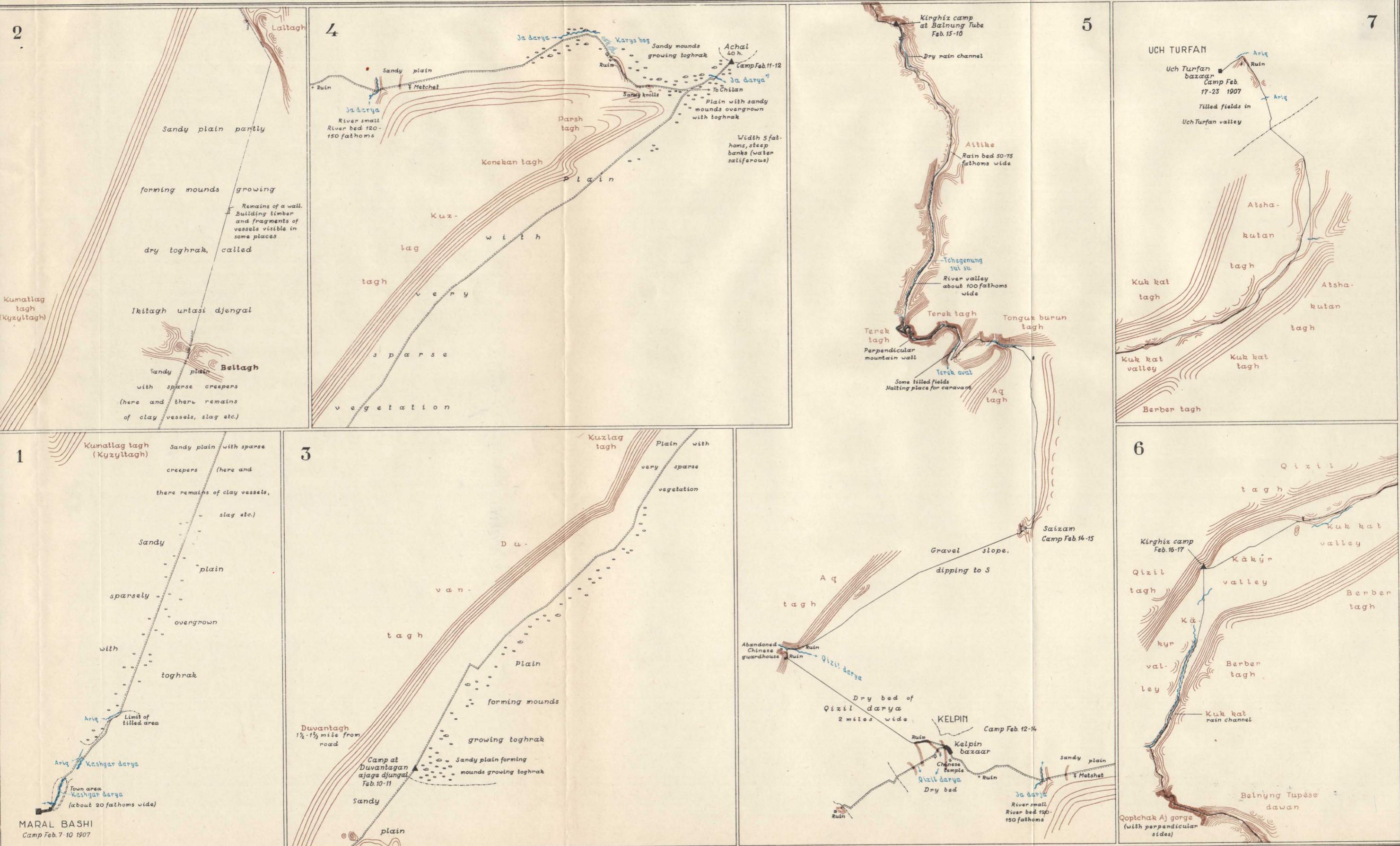
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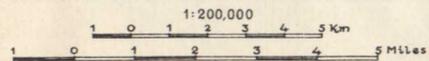
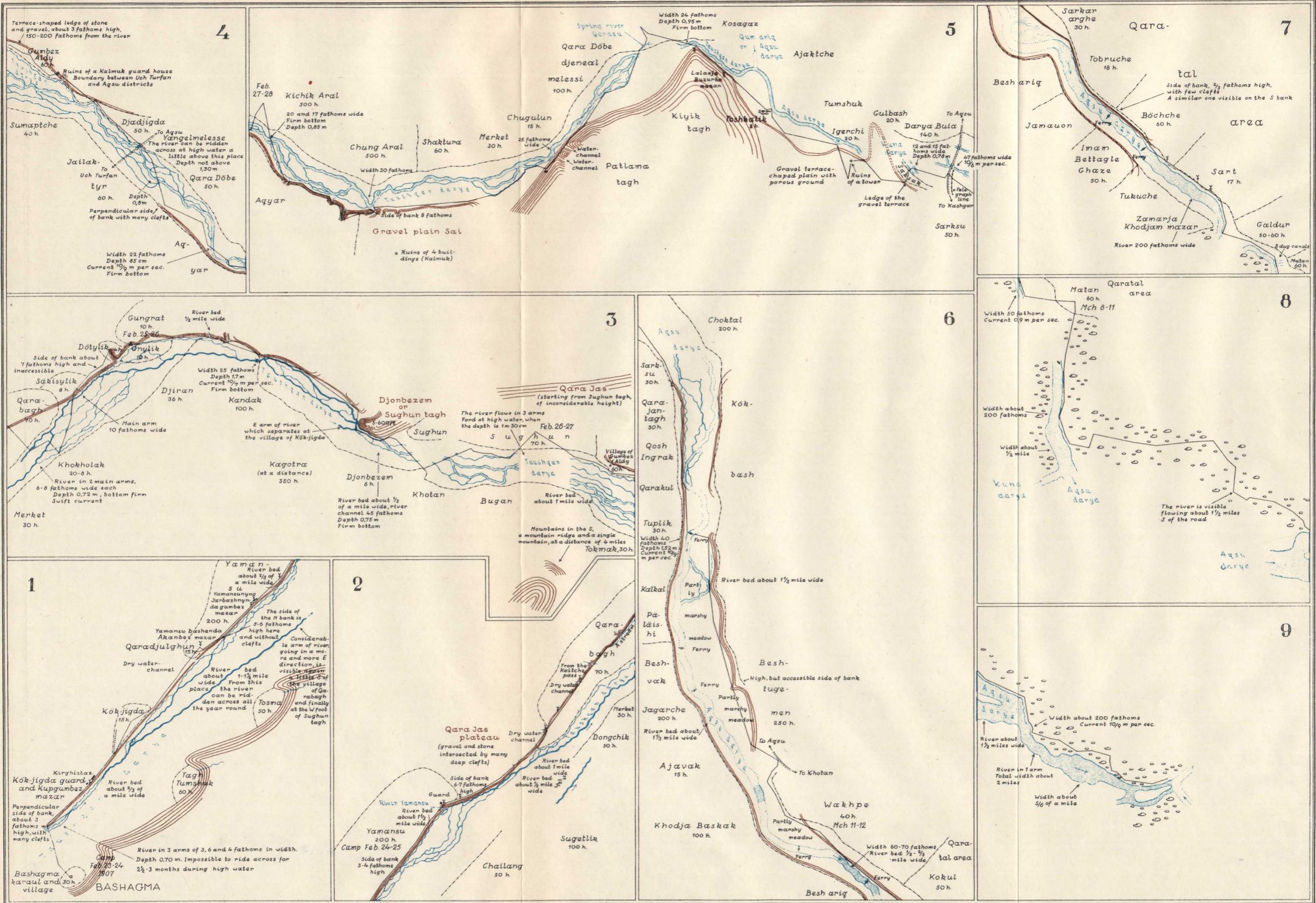
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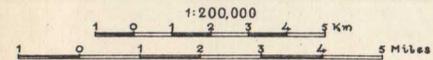
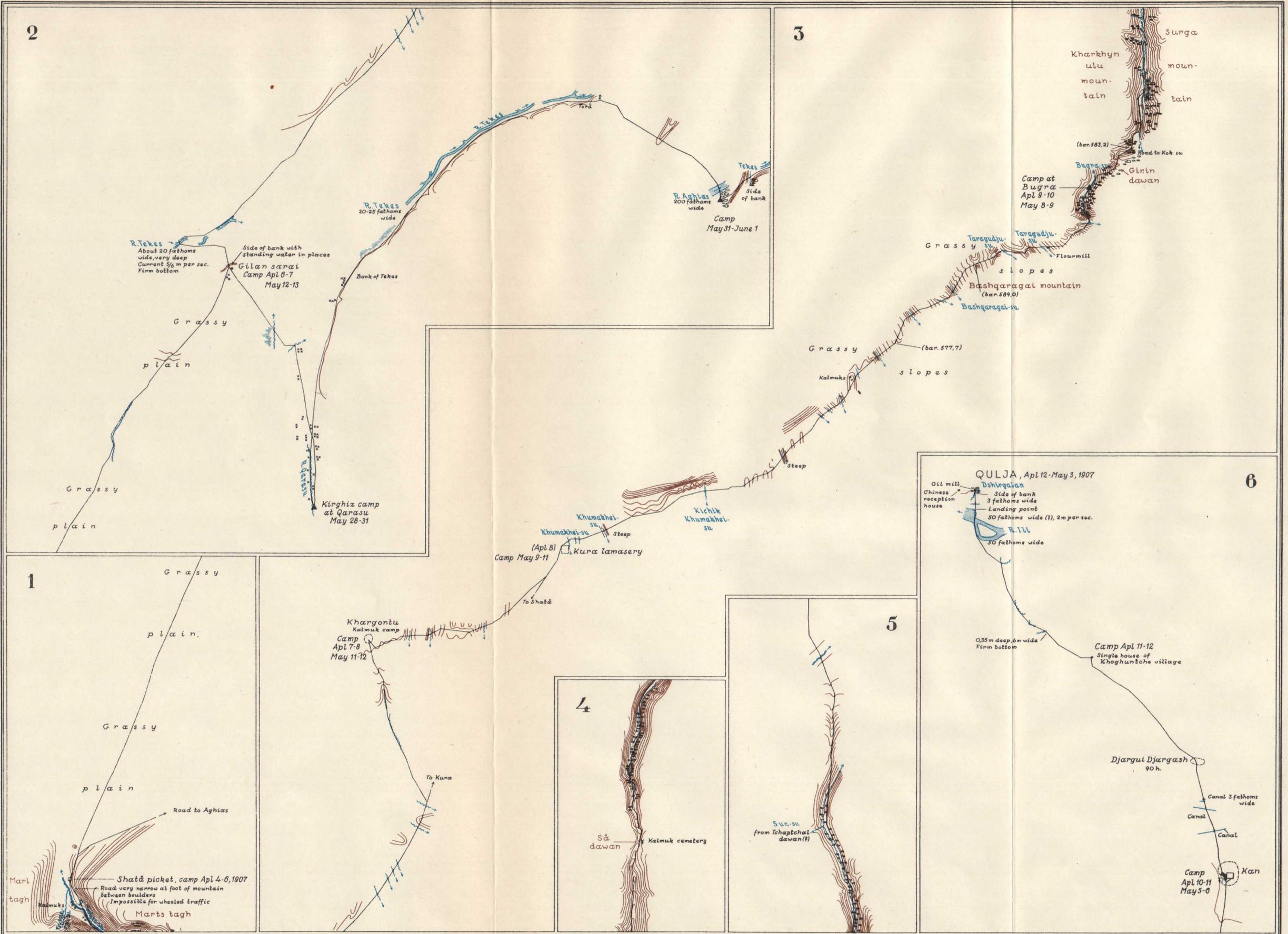
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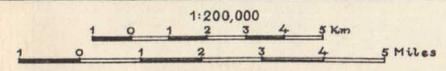
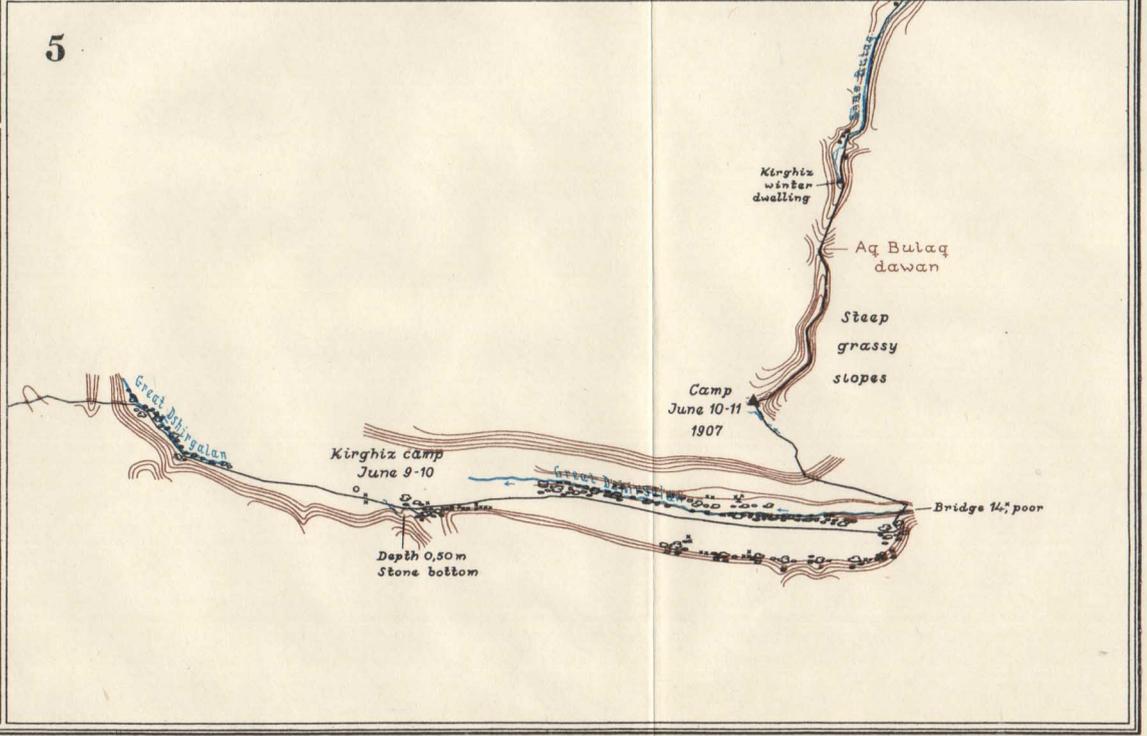
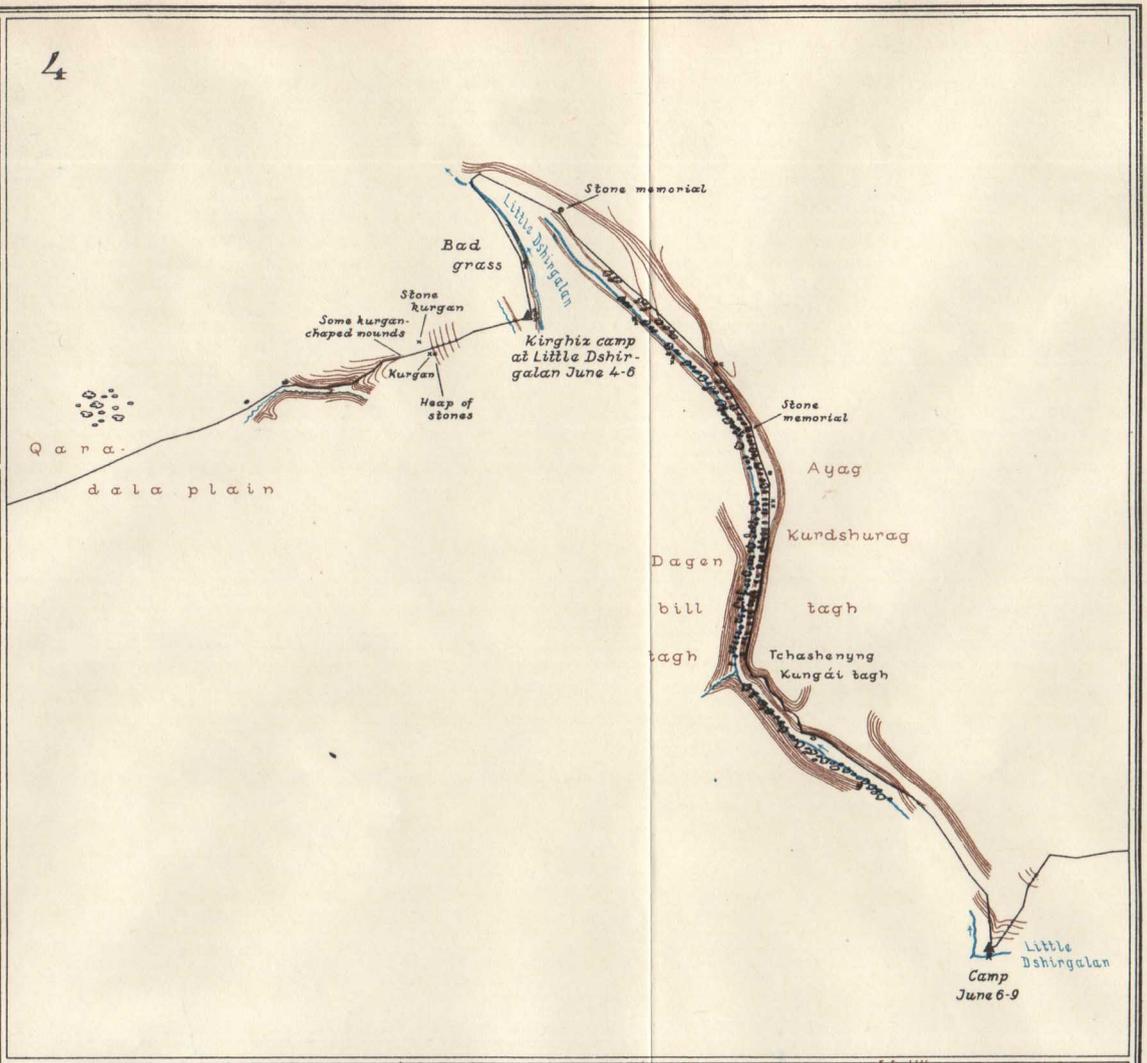
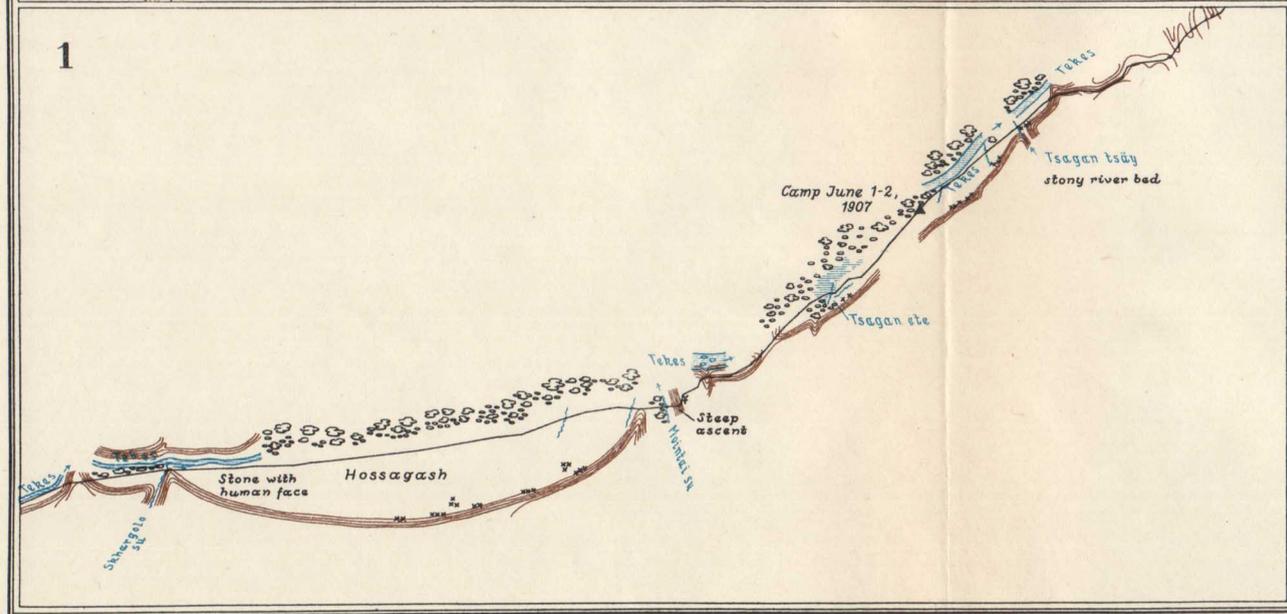
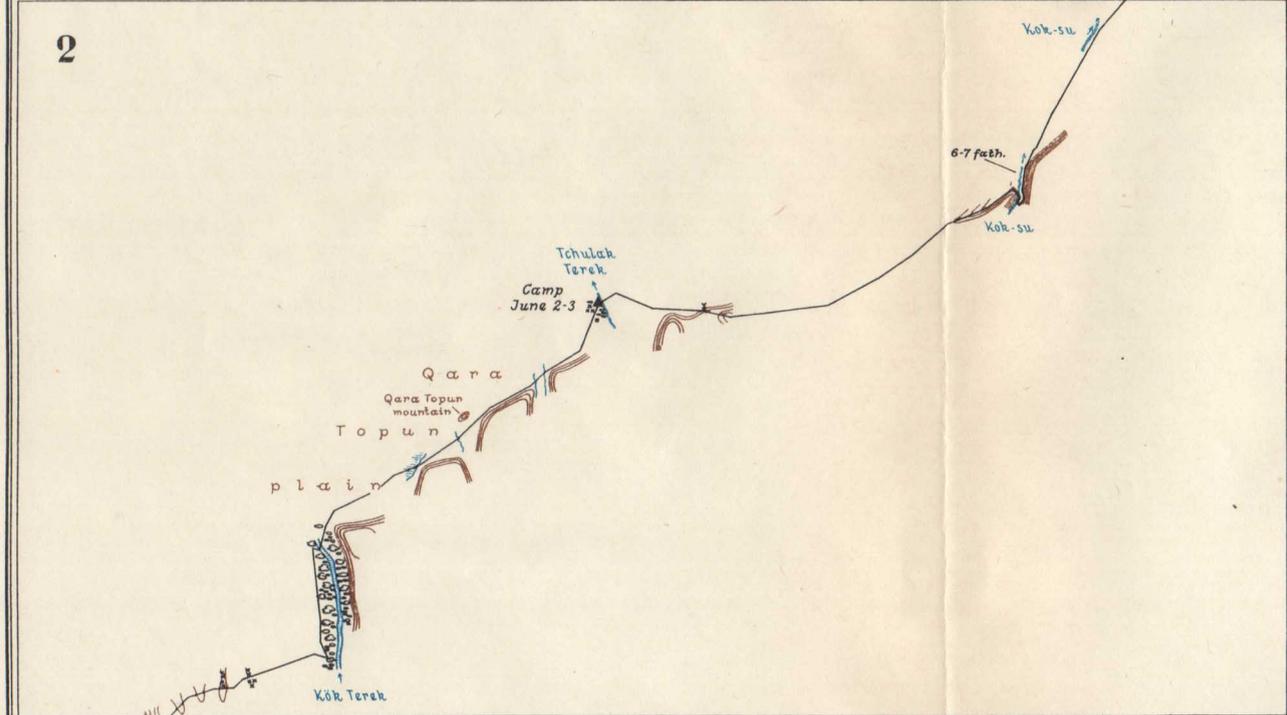
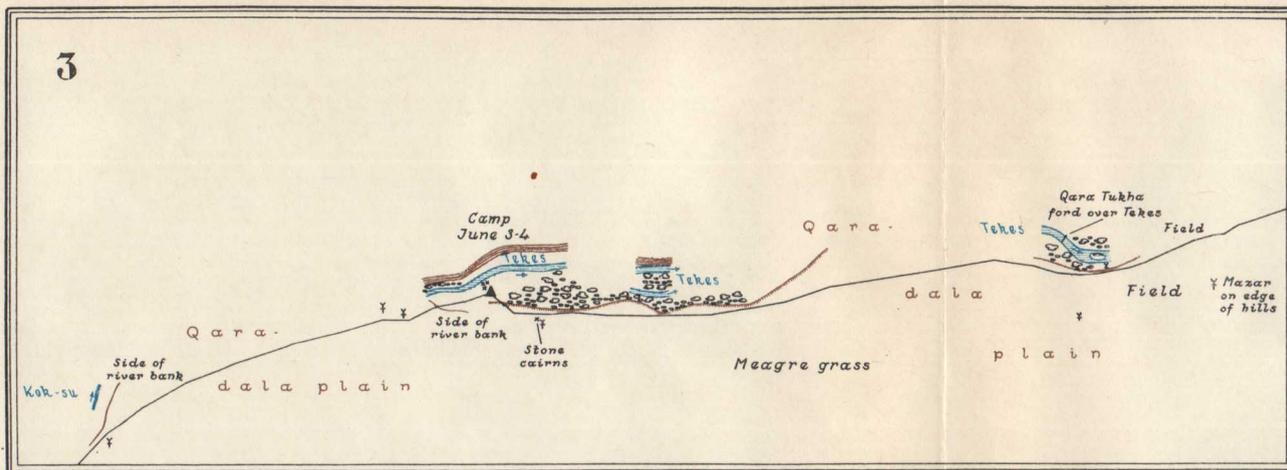


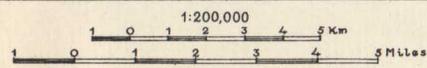
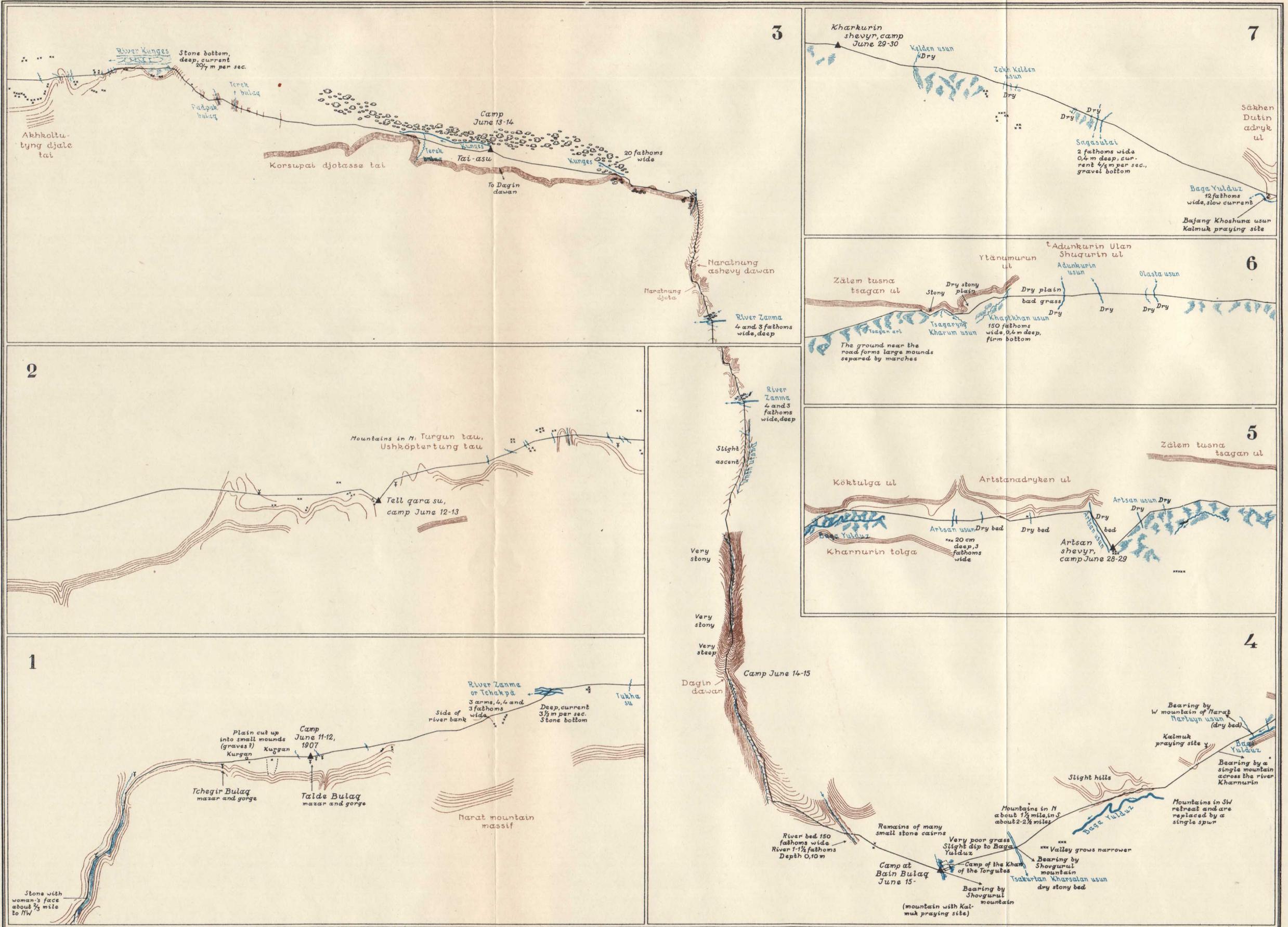


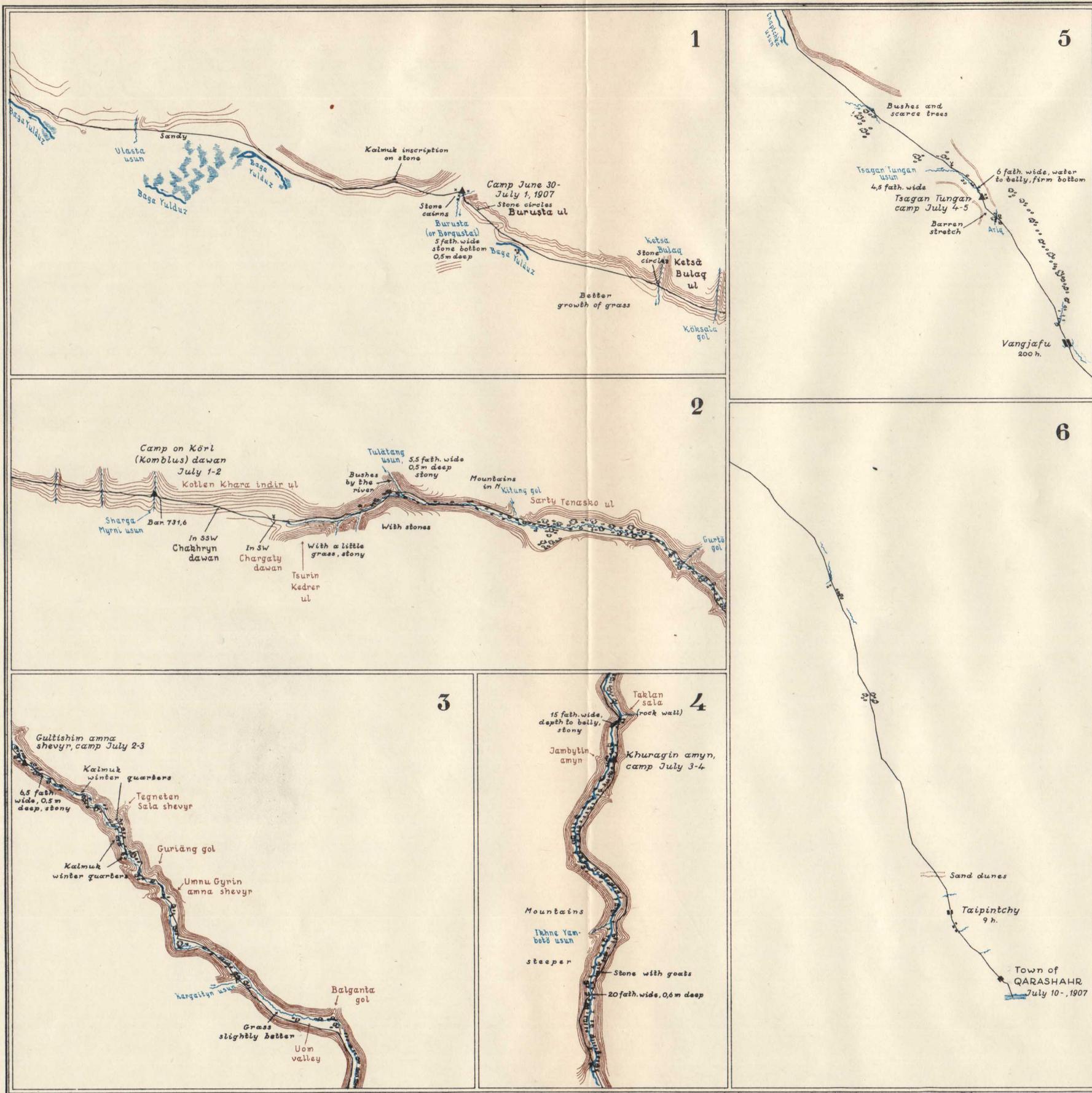


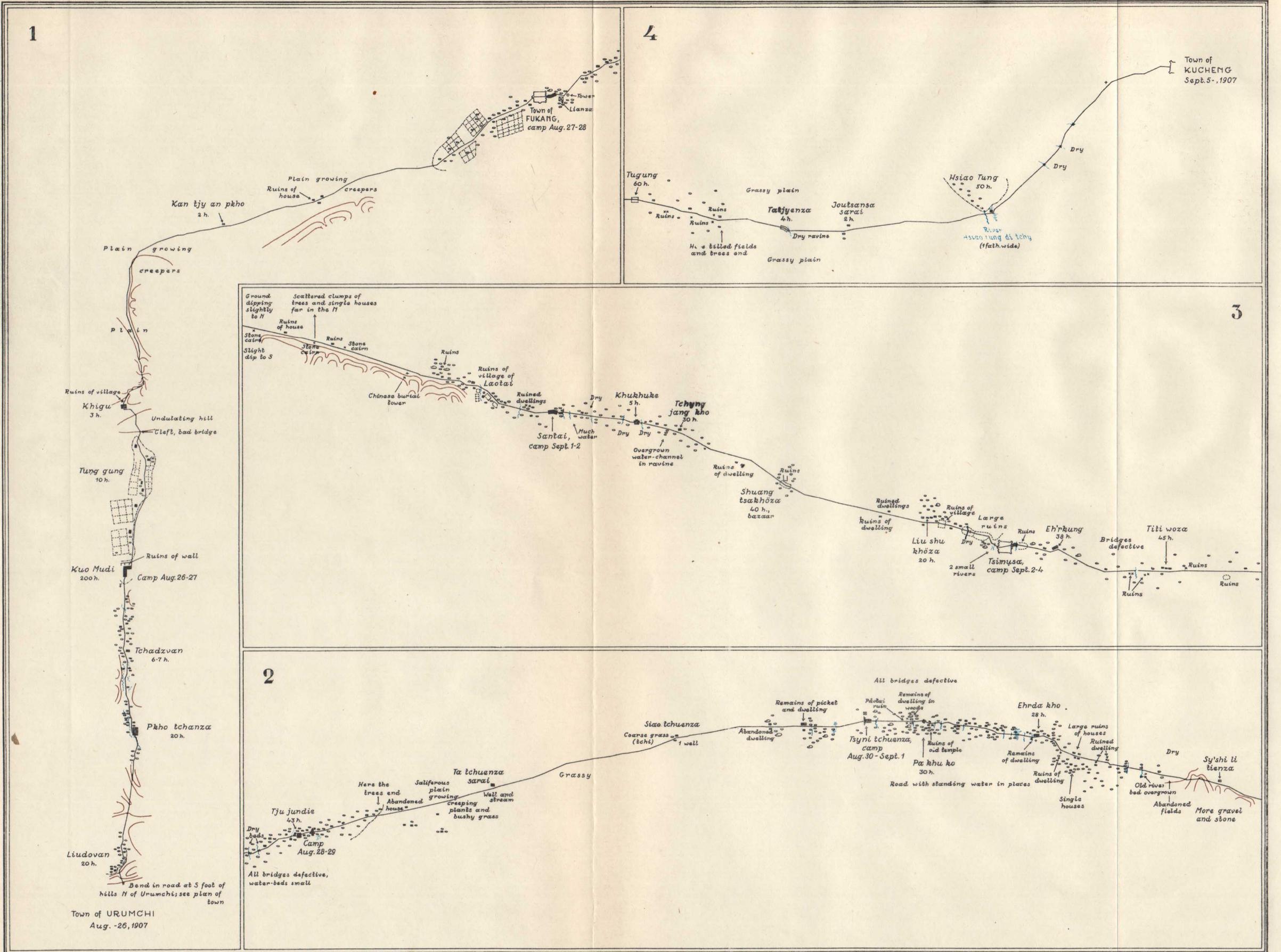


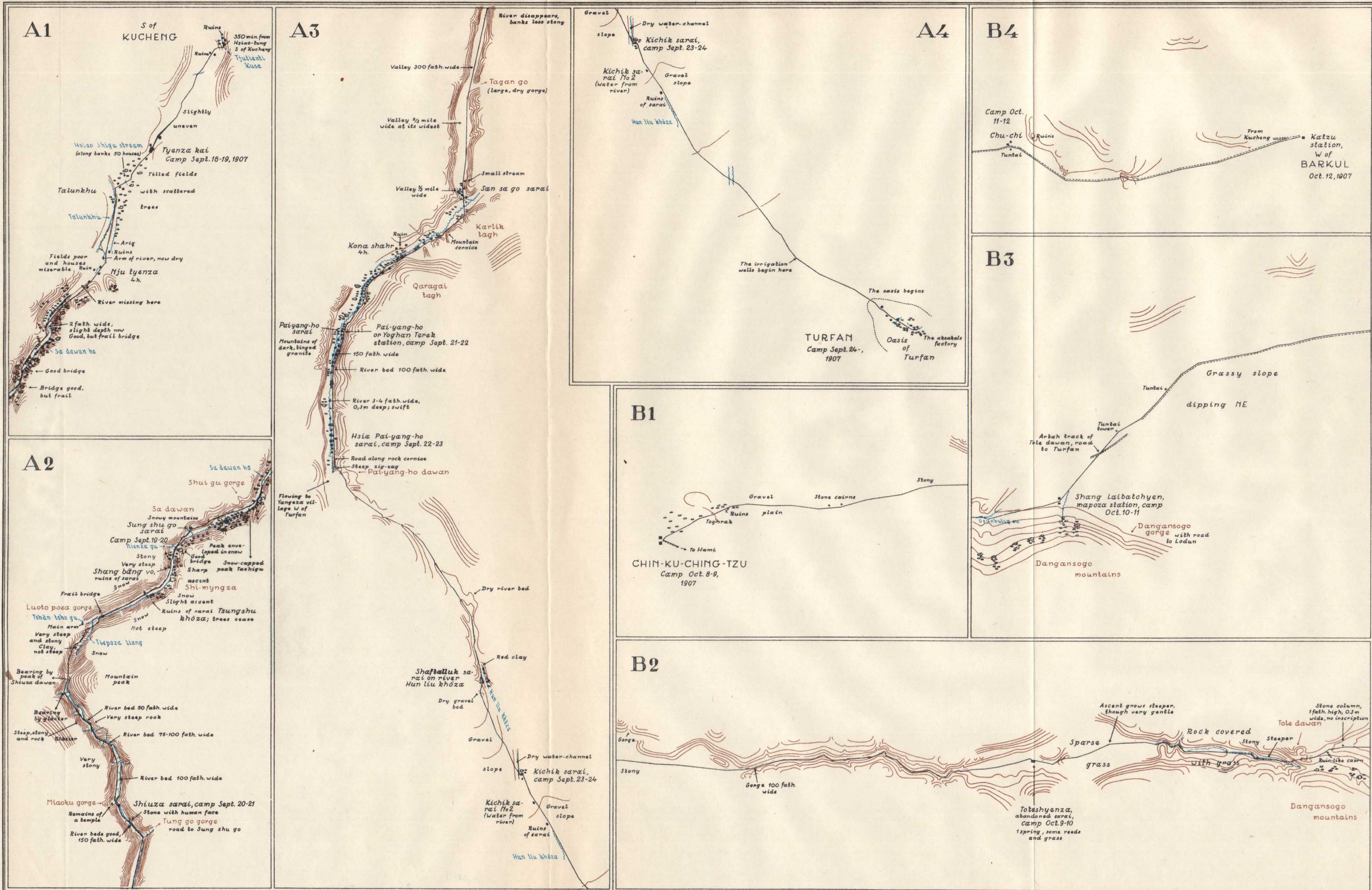


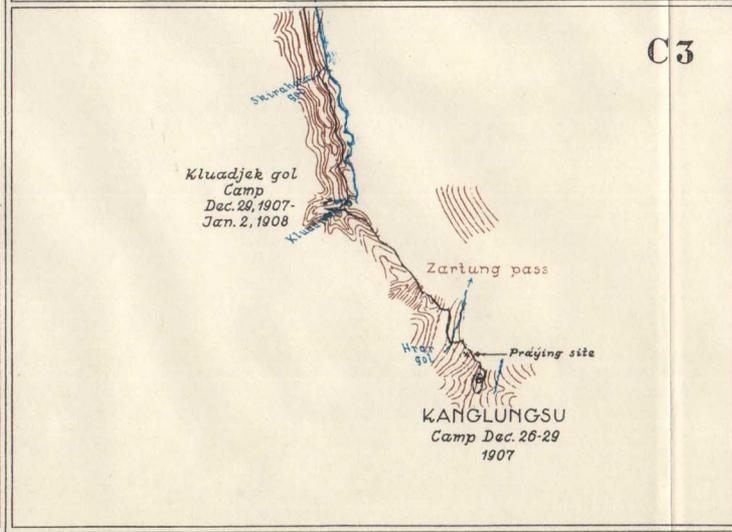
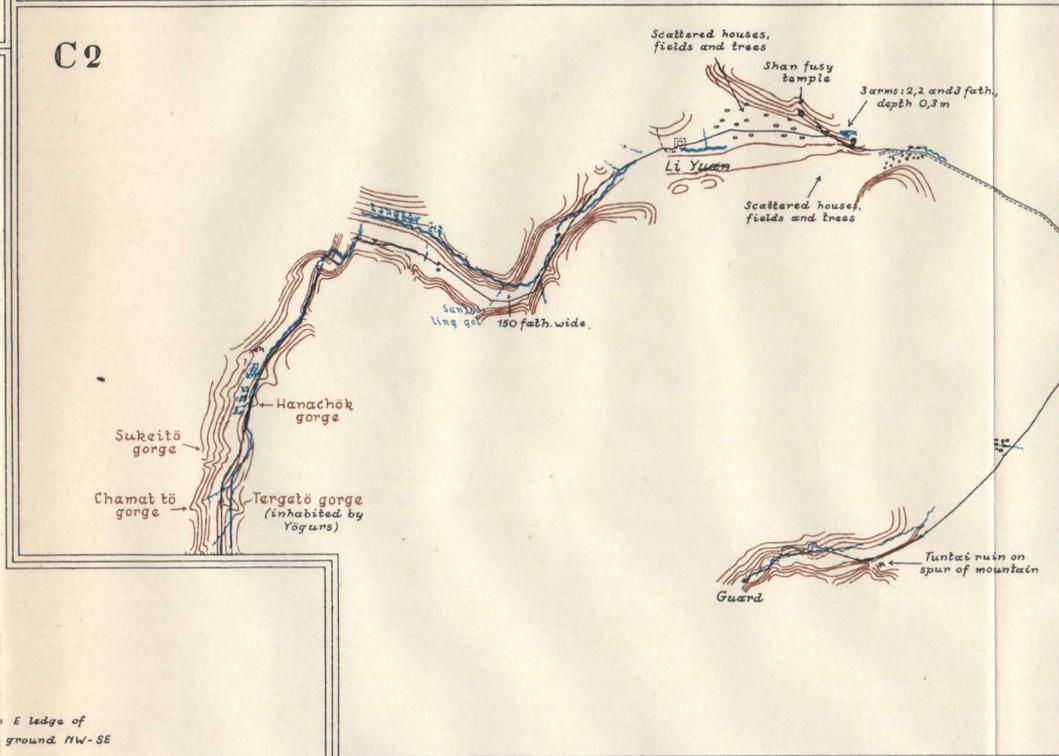
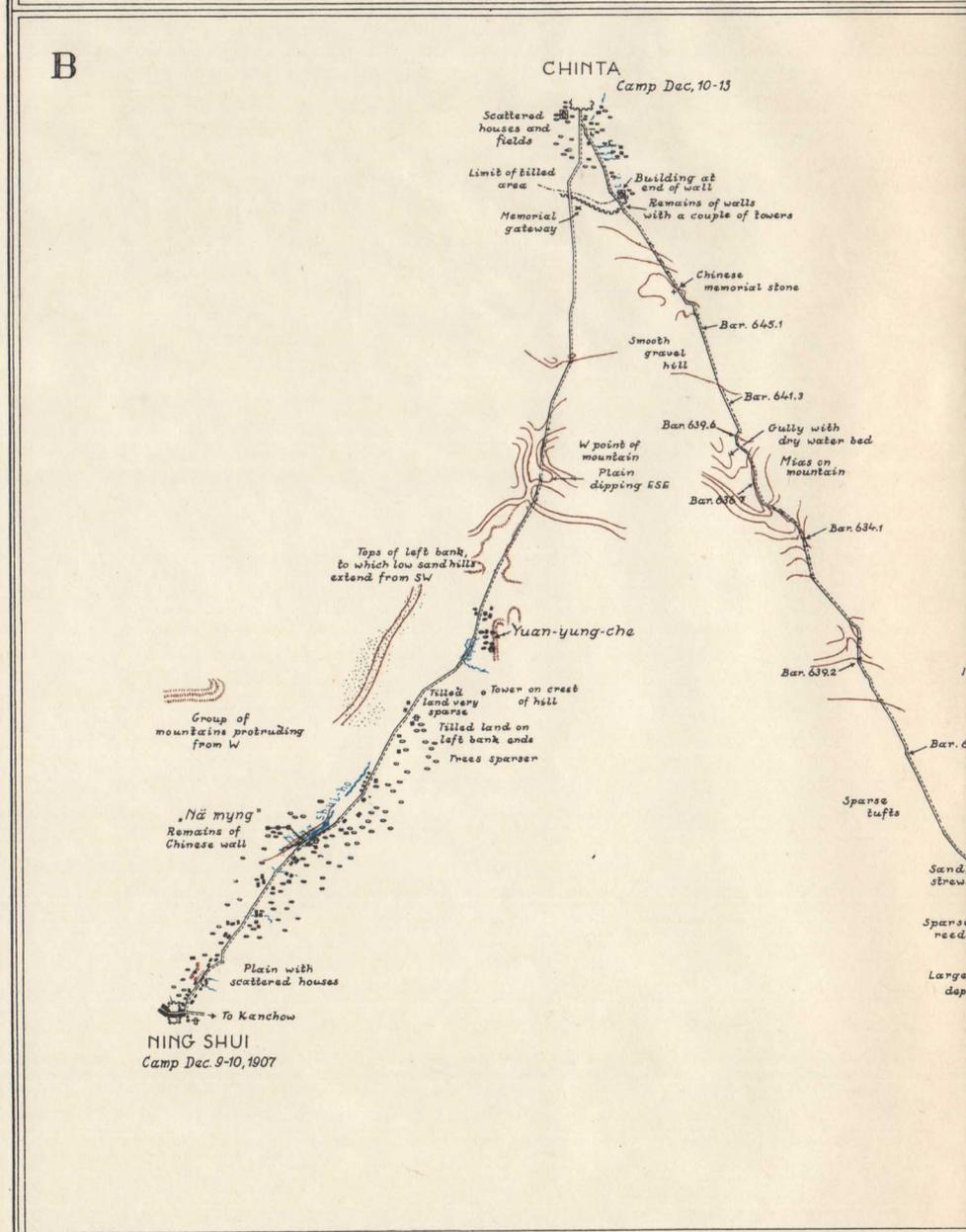
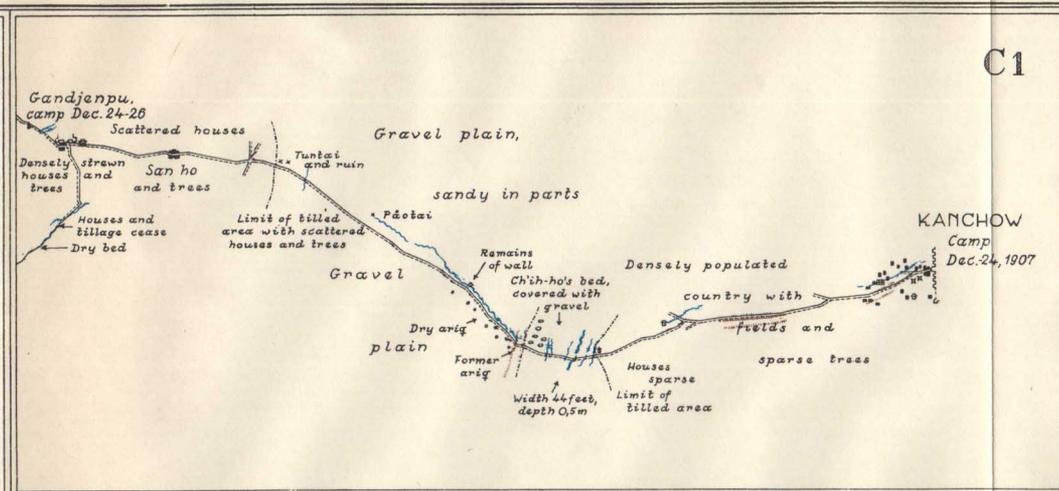
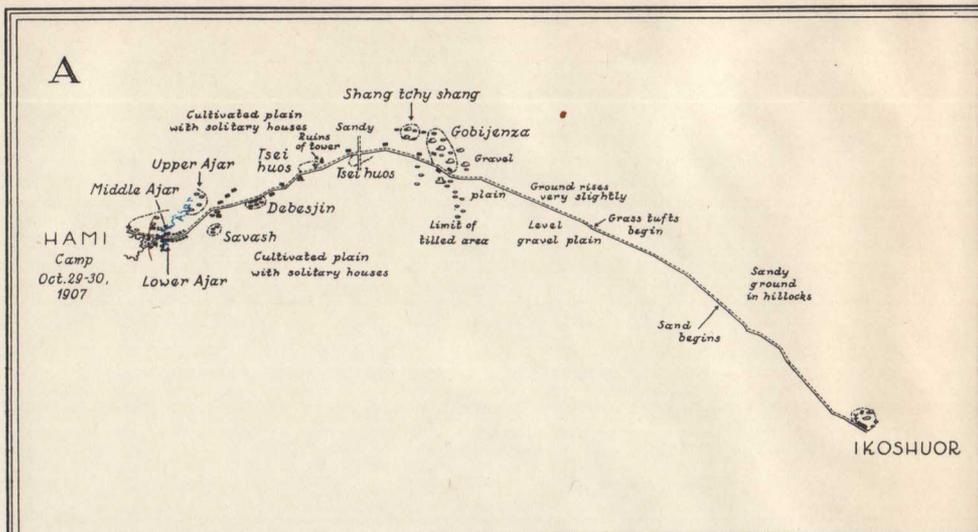


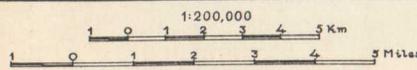
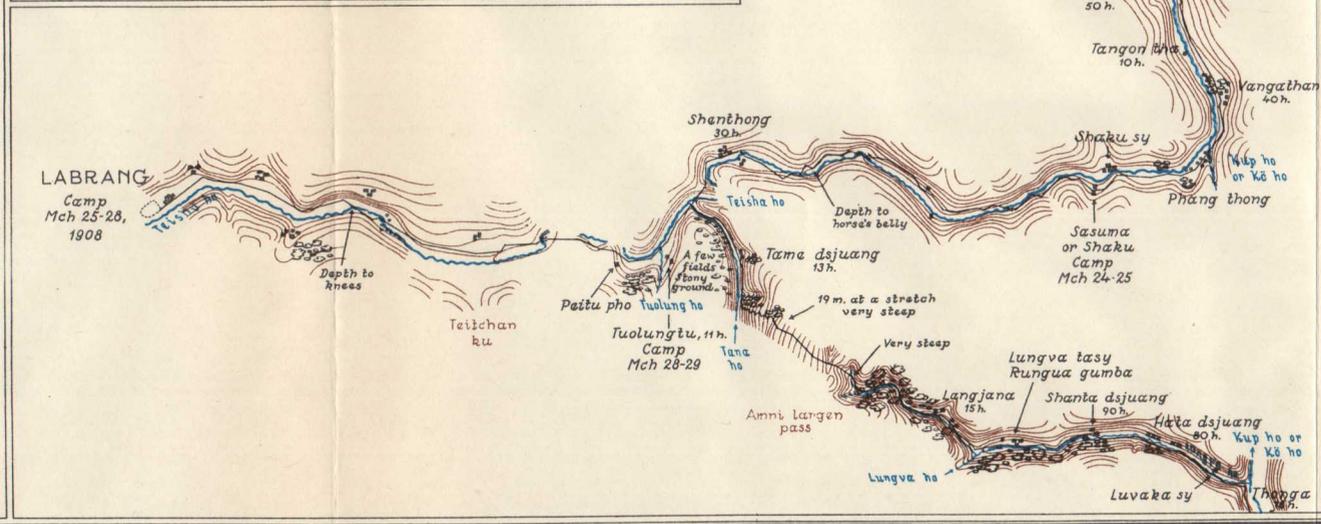
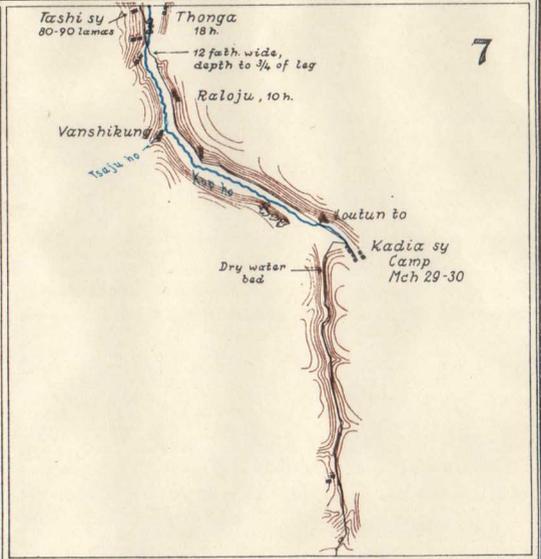
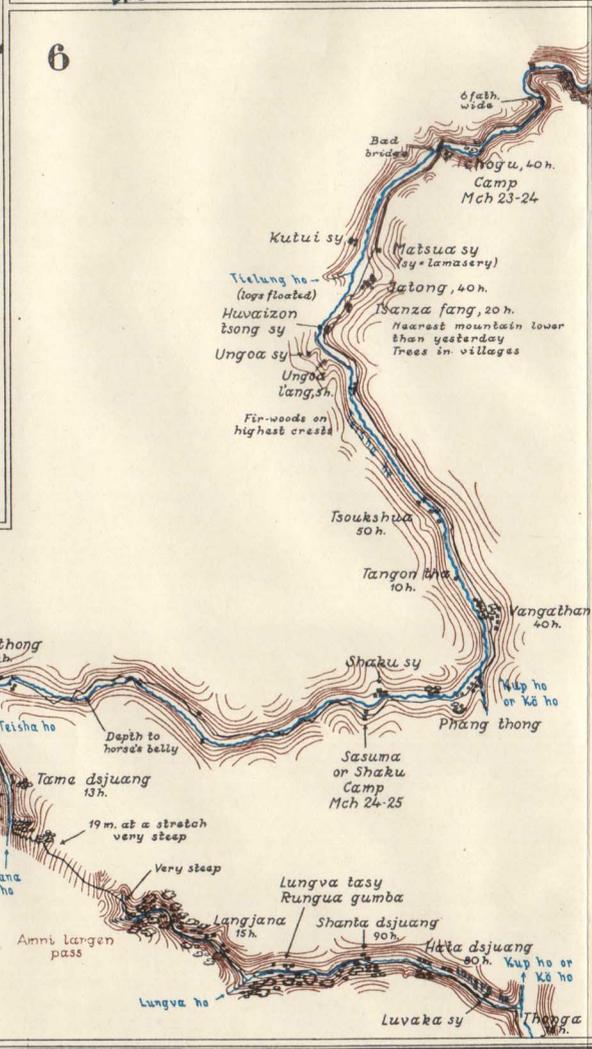
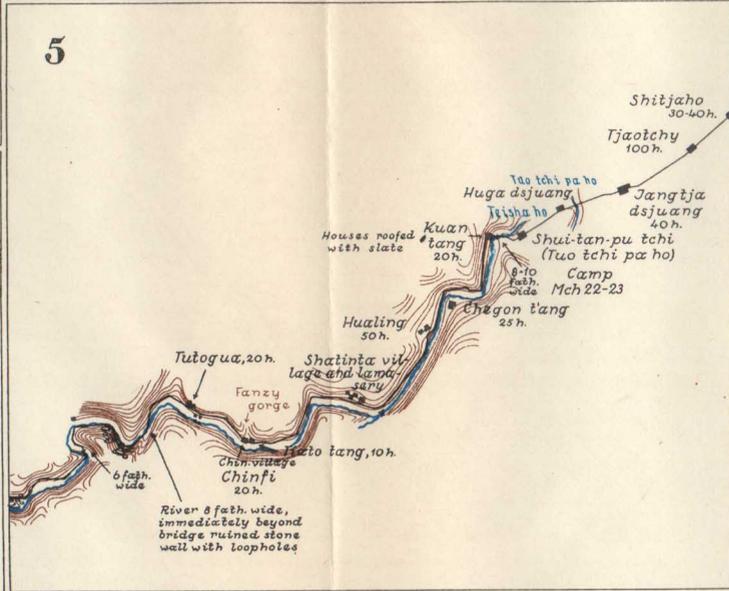
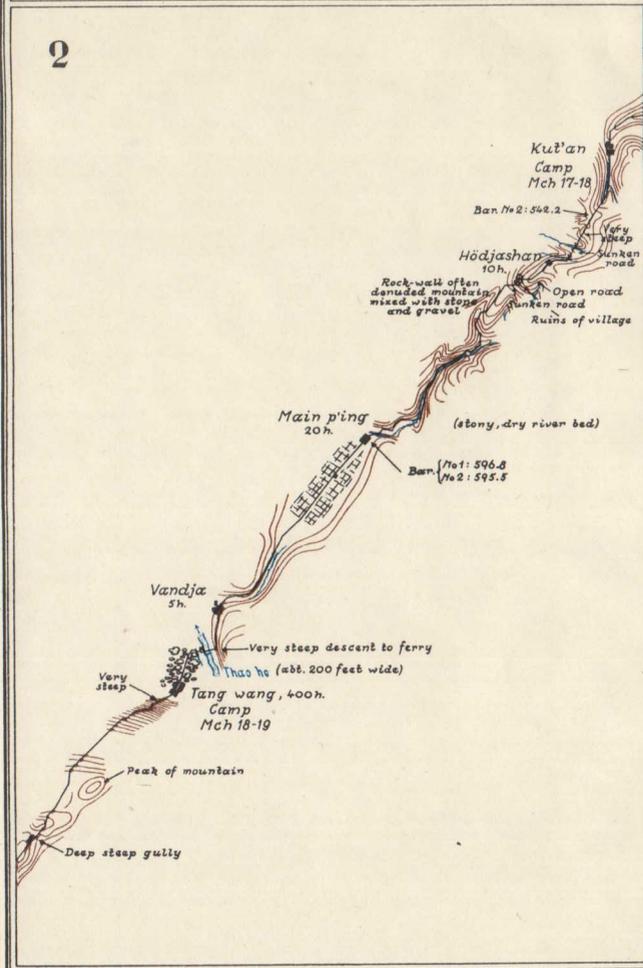
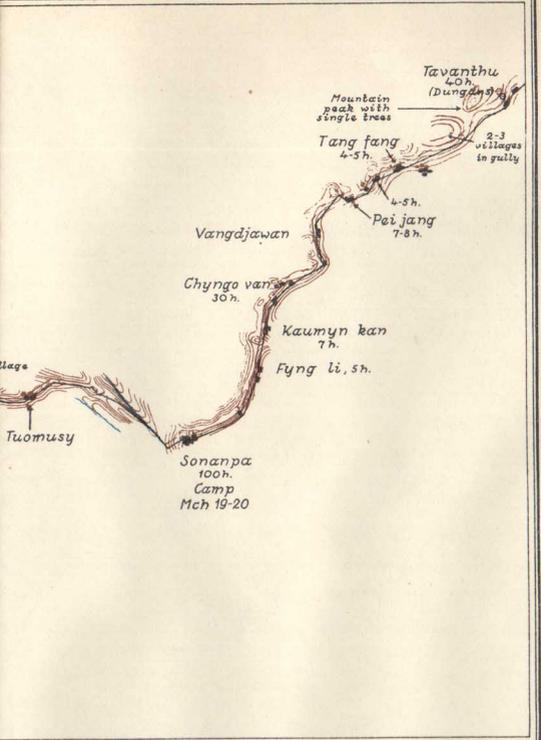
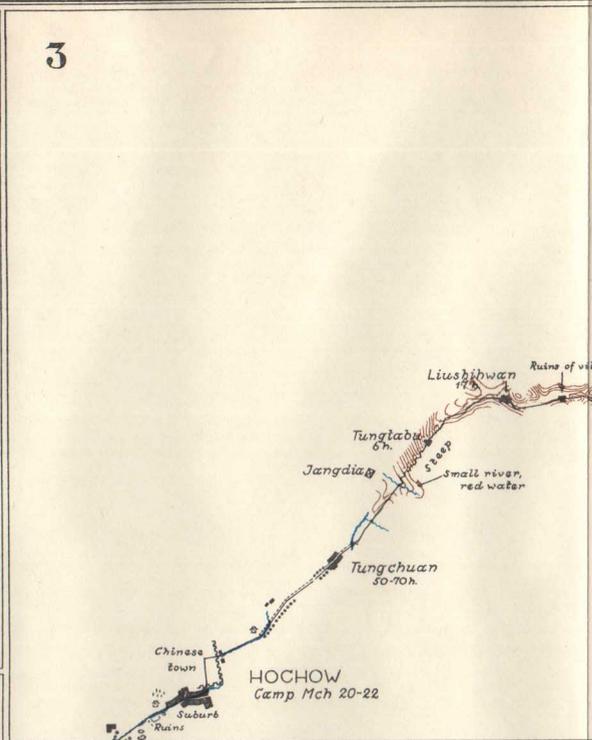
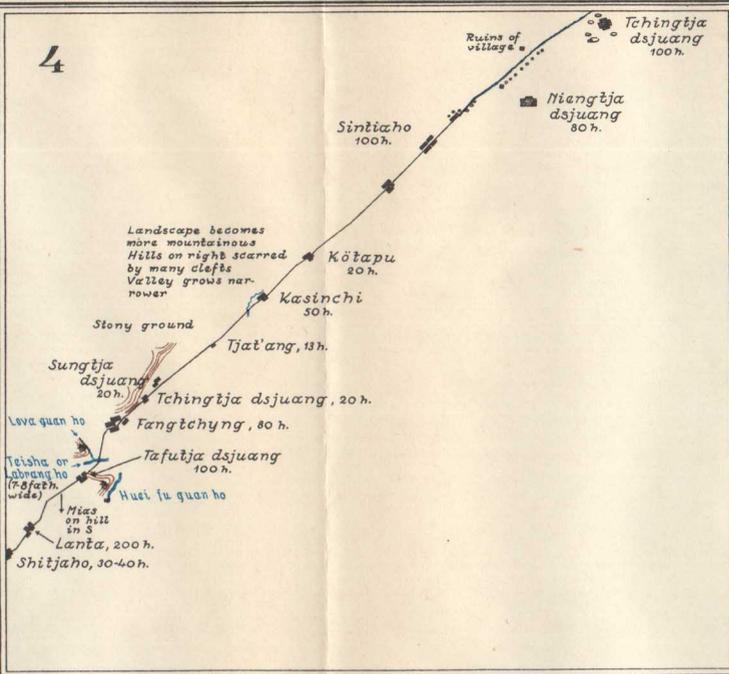
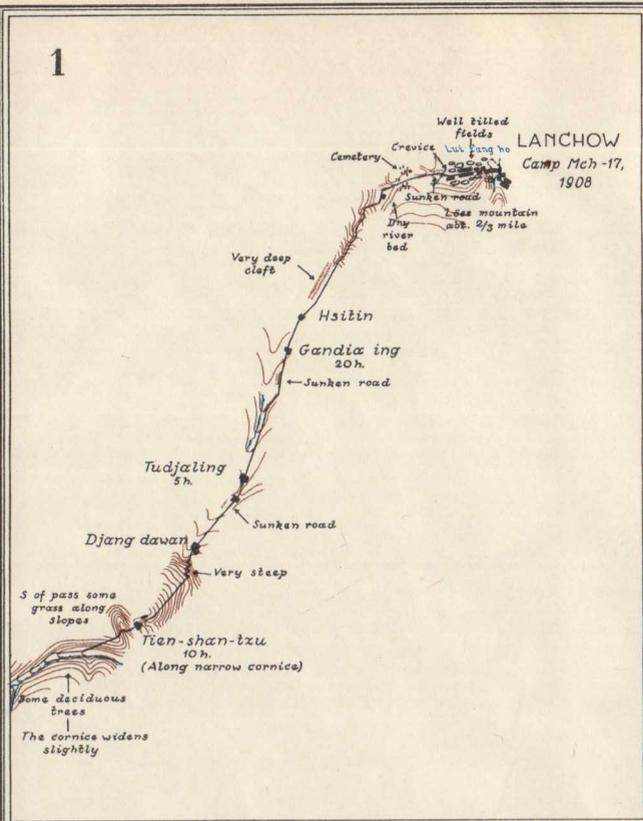


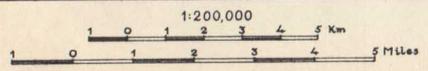
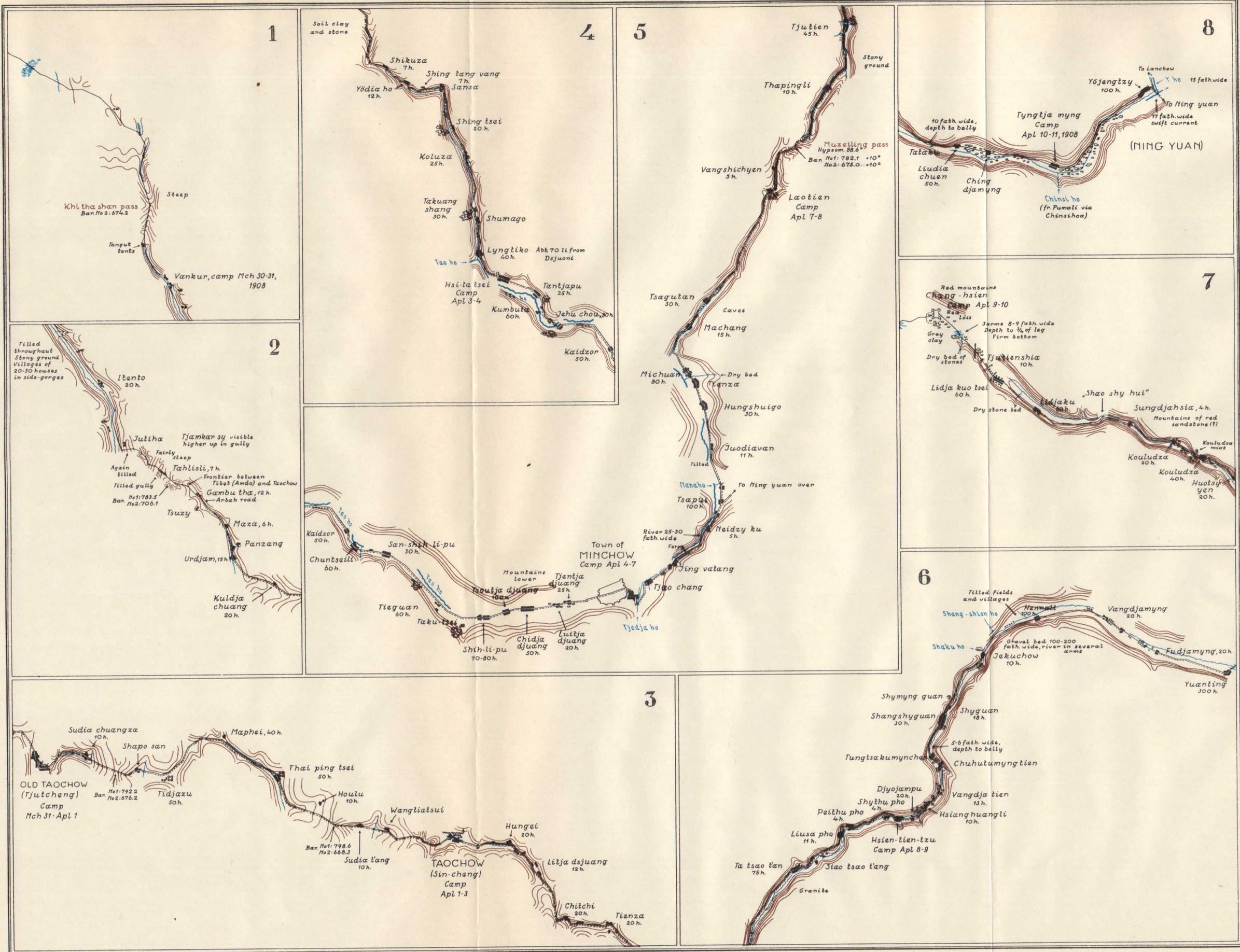




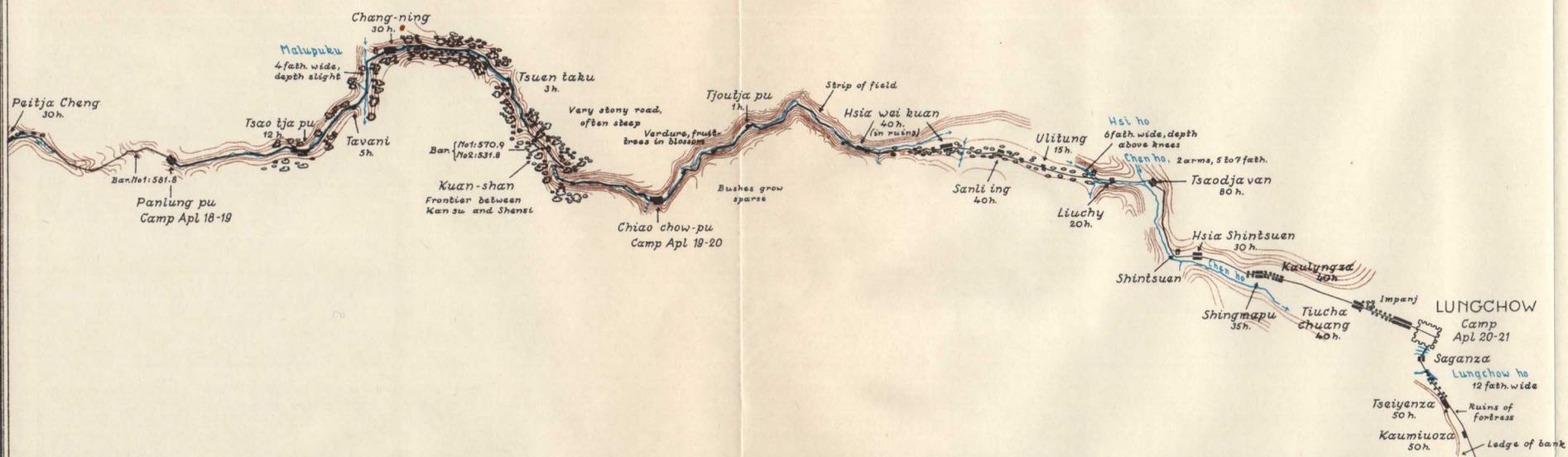




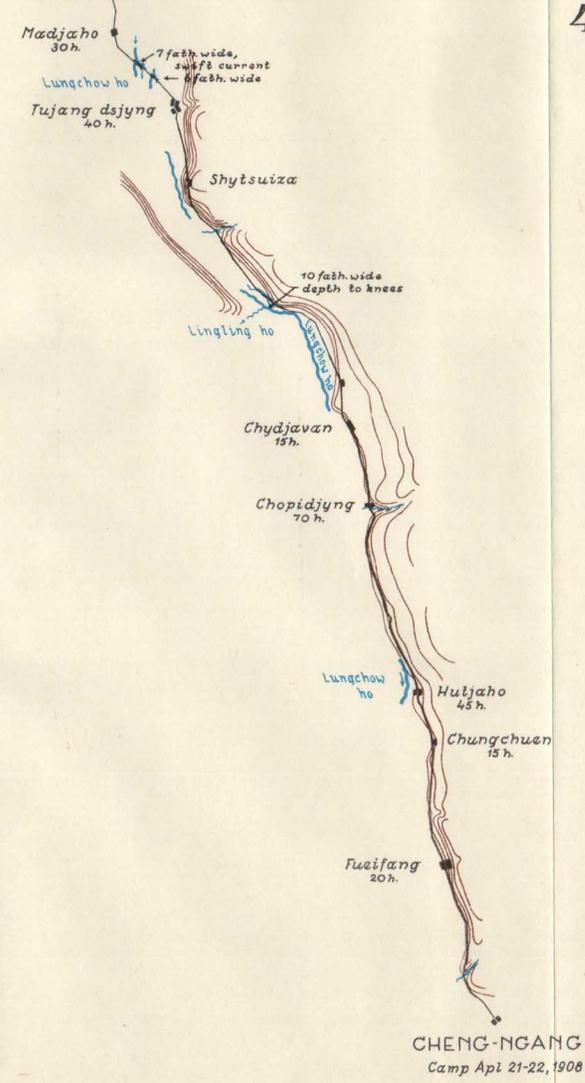




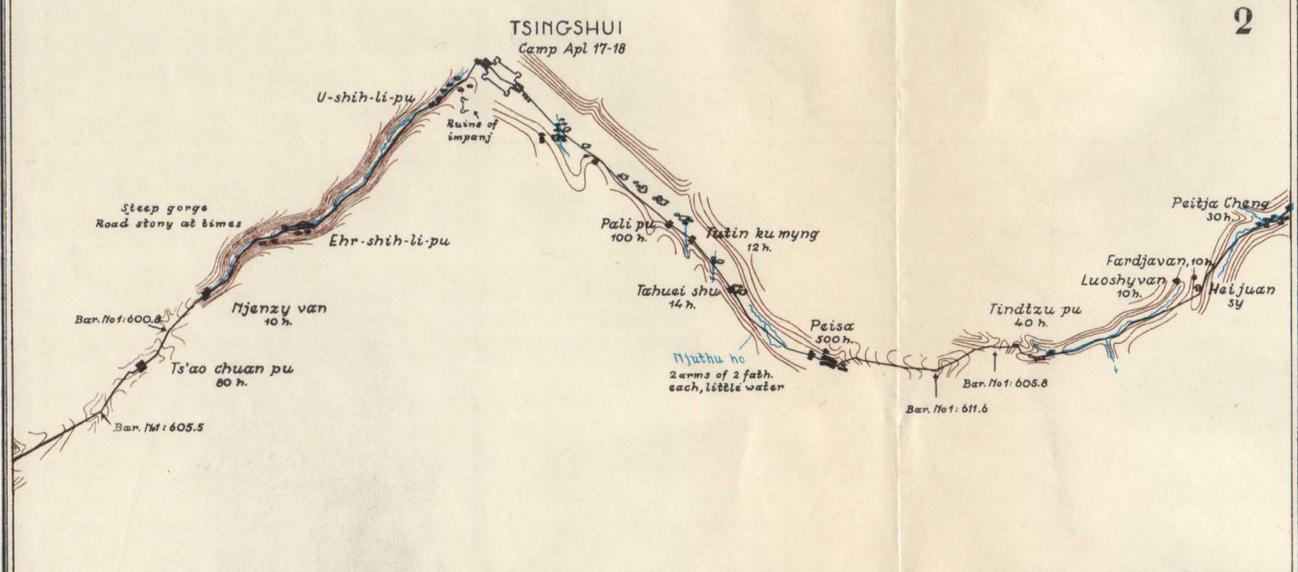
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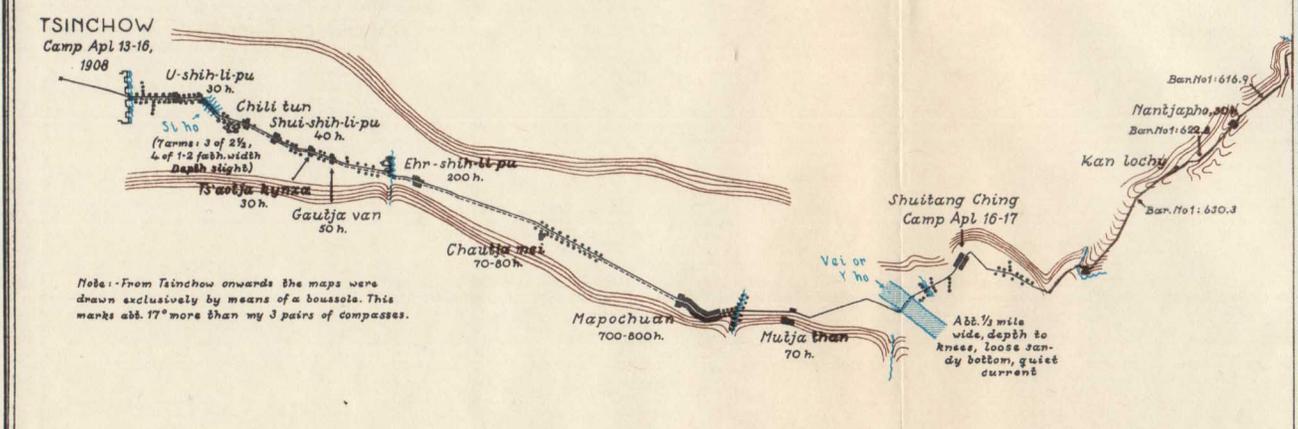
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Note: From Tsinchow onwards the maps were drawn exclusively by means of a boussole. This marks abt. 17° more than my 3 pairs of compasses.

