

X.—On the Accumulation of *Diluvium or Gravel in the Vallies which border the Great Himalaya System of Formations.* By Captain J. D. Herbert, D. S. G.

Along the plainward boundary of the great Mountain System of the Himalaya, which it is known extends from Cabul to Assam, there are disposed, at intervals, a series of vallies, being, with the exception of those of Cashmir and Nepál, the only vallies connected with that great tract of mountains. They are always bounded towards the south-west by low sandstone hills;—low I mean in comparison with their northern wall, which are generally of the grey wacke formation, with limestone associated. Their surface is either level or moderately undulating, and the rock is seldom visible except in the hills that bound them. As examples of these vallies, I may mention those of Makowál or Rópar, Pinjór, Kyárda, Déhra, Patli, all between the Setlej and the Gágrah; and again that of Chetaín, which lies to the north of Bettíah. These are all that the writer has seen, but they continue, doubtless, along the whole line at intervals. They are from 20 to 50 miles in length, and of variable breadth, the widest being about 20. A peculiarity of their structure consists in their having two outlets for their drainage, one at each end; their highest level being, somewhere between, though not always exactly, in the middle. These rivers are generally remarkable for the quantity of rounded stones they contain in their beds, which sometimes extend even fifteen miles from the mouth of the valley. These rounded stones comprise every variety of rock that is to be found in the interior of the hills—some of them being of such peculiarity of character as to be traceable, with the greatest certainty, to a distance upward of 25 miles. They are perfectly rounded, though varying in shape from lenticular through every variety of spheroidal to perfect spherical. Their size is most commonly about 3 to 6 or 7 inches in diameter, but they are found both larger and smaller than this.

These boulders, as they have been called, are also found along the foot of the sandstone range that bounds these vallies, and in the beds of the torrents which intersect them, whether on the plain or valley side. They sometimes form small tables or flat-topped hills, separate from the sandstone range, and they appear to be spread out at the foot of this sandstone range to a certain distance. The thickness of some of these deposits is very great. On the road to Bhamaúri, a well was attempted to be sunk at Tandah; but though the depth of 150 feet was attained, they had not penetrated through the deposit, or come upon any spring of water. At Chilcia, about 60 feet was cut through, with a similar want of success. These facts show the great thickness of these beds.

The soil in the vallies is of various character, but generally it may be described as more or less gravelly. On digging to any depth, gravel is met with more abundantly, though sometimes a reddish brick earth is found instead. The gravel consists of stones more or less rounded, chiefly of quartz, of argillaceous quartz, of limestone both common and magnesian, and of conglomerate. Angular fragments of clay slate are also found. All these latter rocks are in the hills which bound the valley immediately to the north. The deposit, whatever be its nature, is of great depth, as is obvious from the following account of it, for which I am indebted to the Hon. Mr. Shore, who sank a well in the Déhra dún, to the depth of 220 feet. The particulars of this operation appear to have been carefully noted by Mr. Shore, and I am happy to place them on record in the pages of the GLEANINGS.

Particulars of the strata observed in sinking a well shaft, about 1½ mile south of the town of Dehra.

Feet.	Total.	Description.
5	5	Fine black mould, with a few stones.
4	9	Reddish earth, mixed with gravel.
9	18	Loose sand and gravel; large stones, with reddish clay.
2	20	Ditto.
3	23	Stiff reddish clay.
8	31	Stiff yellow clay.
3½	34½	Sand and gravel, mixed with a little red clay.
1½	36	Stiff reddish clay.
2	38	Sand and gravel.
22	60	Stiff red clay.
2	62	Clay, sand, and gravel mixed.
16	78	Sand and gravel.

12	90	Stiff yellow clay, with a little sand.
35	125	Sand and gravel; a few round stones.
3	128	Ditto; large blocks of conglomerate.
3	131	Ditto.
13	144	Sand and gravel, with tolerably sized stones.
5	149	Ditto ditto, stones larger.
9	158	Ditto ditto, with pieces of conglomerate.
4	162	Ditto ditto, with enormous stones.
6	168	Conglomerate on 3 sides; gravel the 4th.
3	171	Sand and gravel, moist occasionally: pieces of conglomerate.
3	174	Conglomerate, blocks of.
3½	177½	Layers of sand and gravel; pieces of conglomerate.
4½	182	Sand and gravel.
2	182½	Conglomerate; under it water, but scanty.
2	185	Sand and clay.
18	185½	Conglomerate.
5	204	Sand and gravel, rather loose occasionally: pieces of conglomerate, occasionally solid blocks, 160 lbs. in weight.
5	209	Sand and gravel very moist.
1	209	Conglomerate over half the well spring.
7	211	Red clay.
7	218	Sand and gravel, very moist spring.
3½	221½	Blackish clay, with angular fragments of clay slate.

## XI.—Miscellaneous Notices.

### 1. *Progress of Science in India.*

We have occasionally communicated to our readers phenomena of an interesting description, which have taken place in India, and expressed our regret that so many observations, which might be of use to the advancement of science, and which we were informed had been made in India, should be lost for the want of some channel through which they might be conveyed to the public. Since we first alluded to the subject, various societies have been established in the great eastern portion of the British dominions for the cultivation of physical knowledge. The first volume of the memoirs of the Geological Society of Calcutta has just reached England, containing several papers, not only of local, but of general interest. As the first fruits of an enlightened love for science, we regard this work with excessive pleasure, and doubt not, from the well known zeal of our countrymen in the East, that each succeeding volume will increase in interest.

An enlightened friend to science in all its branches, as well as an efficient patron of it, Sir Edward Ryan, has exerted himself to establish a Scientific Journal as a depot for all the floating observations which may be made in India. In the present humble form of this small pamphlet, we can perceive the germ of future excellence. An original paper on Indigo, which it contains, would do honour to the first scientific publication in Europe. It is not suited for our pages, but we doubt not it will meet insertion from some journal more exclusively devoted to scientific subjects, and we hope that due acknowledgement may be made of the obligation. Now that a commencement has been made in India, and the example has been set by the first presidency, it is to be expected that Madras and Bombay will not remain behind. The advantages that must result from this are incalculable; for extensive as our dominion is in India, the natural history of the country is but imperfectly known. In exploring its more remote districts, some travellers have been eminently successful, and the results of their enquiries have been made known to the world; still there are many provinces which have been rarely trod by the foot of a European, and the notes made concerning them being too hasty or too few to form a volume, have been perused only by the friends of the author. The establishment of a journal in which all such productions may find a place, must form an epoch in the history of British India. As the increase of its contents will necessarily lead to the appearance of articles of the highest interest, we shall always make known such to our readers, to whom we ourselves have frequently suggested, that as the interests of science are greatly advanced by the immediate insertion of observations, we should always feel happy to receive into our scientific varieties any communication, of which the truth of the facts it contains can be properly authenticated.—*Monthly Magazine.*