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GENERAL

SIR WILLIAM ERSKINE BAKER, K.C.B.

ROYAL ENGINEERS (BENGAL).

COMPILED BY

TWO OLD FRIENDS, BROTHER OFFICERS,

AND PUPILS.

> ....." a worthy man
> That fro the time that he firste began
> To riden out, he lovèd chevalrie,
> Trouthe and honour, fredom & curtesie.
>
> . . . . . .
>
> And though that he was worthy he was wise,
> And of his port as meke as is a mayde.
> He never yet no vilanie ne sayde
> In alle his lif, unto no manere wight.
> He was a veray parfit gentil knight."
>
> CHAUCER.

LONDON.

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1882.

found in the hills in which the Sutlej took its origin, made this opinion the more probable".[5]

The Persian passage here alluded to is sufficiently remarkable to be worth quoting from Briggs's translation of Firishta. The historian is describing the various public works of Fíroz Sháh, of which one was an attempt to bring water from the Sutlej, or from one of its tributaries, into the plain of Sirhind:

(A. H. 762, *i.e.*, A. D. 1361.) "On his return in the month of Rujub to Delhy, the King heard that in the vicinity of Perwar was a hill, out of which ran a stream that emptied into the Sutlooj, which stream bore the name of Soorswutty; that beyond the Soorswutty was a smaller stream called the Sulima. It was stated that if a large mound, which intervened between the streams, were cut through, the water of the Soorswuttee would fall into the small stream, from whence it would come to Soonam, passing through Sirhind and Munsoorpoor, and that the stream would flow all the year round. The King accordingly moved in that direction, and ordered that 50,000 labourers should be collected and employed in cutting through that mound, and forming the junction. *In this mound were found the bones of elephants and men.* The bones of the human forearm measured three guz (5 ft. 2 in.); some of the bones were petrified, and some retained the appearance of bone."[6]

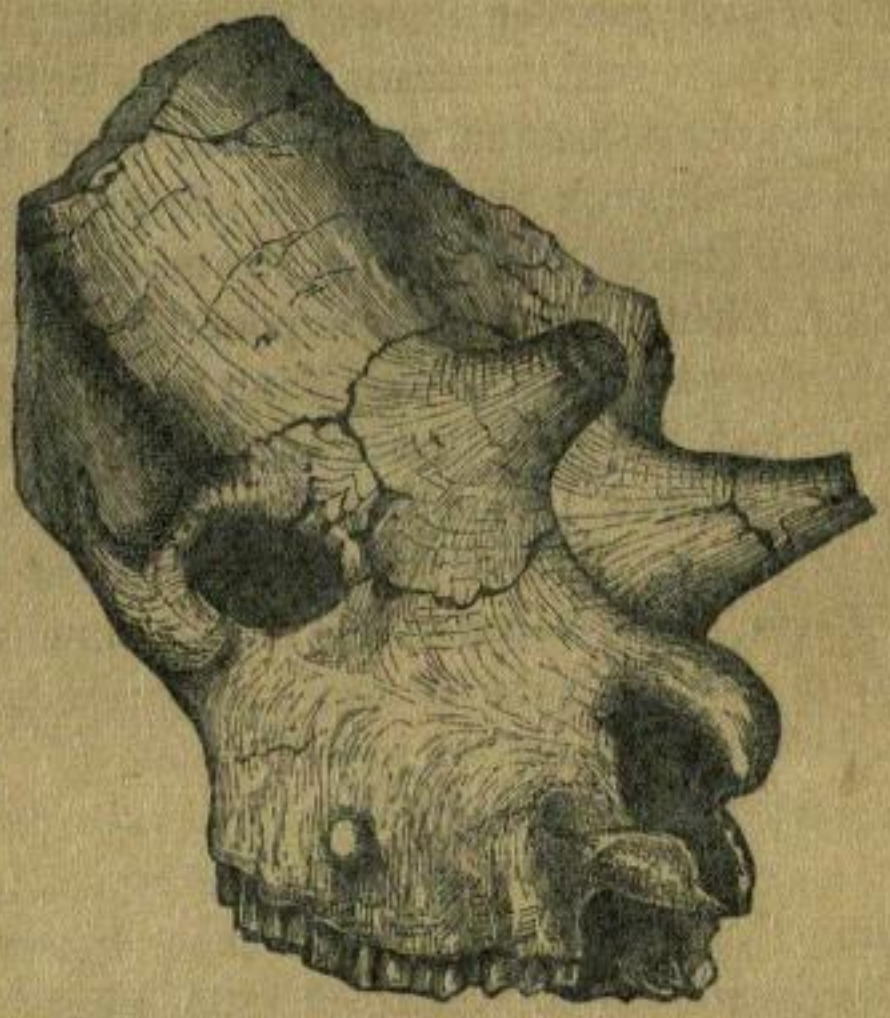
In the cold season of 1831-32 Falconer found a few fragments of fossil bones and shells of tortoises, in the Siwalik hills south-west of Dehra. Nothing more of consequence, however, seems to have been discovered till the spring of 1834, when he found the shell of a fossil tortoise in the Timli Pass, through the same hills. The search was pursued by Cautley with characteristic energy in another of the passes (Kálúwálá), and was rewarded by many important fossils. These finds were on the east of the Jumna,

[5] Letter from Dr. Falconer to Professor Jameson, of Edinburgh, quoted in Dr. Murchison's biographical sketch of Falconer, prefixed to *Palæontological Memoirs*, London, 1868, vol. i, xxvii.

[6] *Briggs*, i, 453. The account of the intended canal is not very intelligible, but see p. 26, where the subject is noticed in connection with a project on which Baker was employed. Firishta was a compiler, writing about two hundred and fifty years after the events here spoken of; and we have been unable to find in Elliot's "Mahommedan Historians" the original source of the statement.

i.e., between the Jumna and the Ganges, but Baker and Durand in the same year discovered extensive fossil deposits of still greater importance between the Jumna and Sutlej; and especially near the valley of the Markanda. The original clue to this discovery was a fossil elephant's grinder, and a piece of a tusk, which were given to Lieutenant Baker by the Raja of Náhan (or Sirmur, a small hill-state north of Umballa) as the remains of giants, said to have been found near Pinjor.[7]

These western deposits now became the great field of search, and the pursuit was followed up by all four friends, Falconer



"Natura certo, quando lasciò l'arte
Di si fatti animali, assai fe bene. . ."

Skull of Sivatherium. (From drawing by W. E. B.)

and Cautley, Baker and Durand, with great zeal and emulation, each of them maintaining workmen on the search, whilst the reports and consignments from the excavations were looked for with the greatest eagerness and interest. In one of the early printed notices Cautley mentions with chagrin how one

[7] The grinder had originally been placed as a votive offering in a temple at Náhan. Baker, recognising the importance of the discovery, obtained possession of it (*Lord Napier's Notes*).

of the people had absconded with a splendid skull of unknown character, and gone off to present it to the Raja as the head of a *Deo*, or god.[8] Even the subordinate Europeans of the Canal Department caught the scientific contagion, and we remember one old warrant officer, Mr. Dawe, who had made a respectable collection on his own account.

It may be conceived that the banks of the Jumna afforded none of the apparatus by which men of science in Europe are enabled to compare and determine fossil species. Falconer, therefore, turned to the living forms around him to supply the want; skeletons of all sorts were prepared, and the extinct structures were compared with their nearest surviving analogues.[9] In this process the genius of Falconer took the lead, but the others followed with intelligent zeal in the same path, so far as their duties permitted; and whilst Baker and Durand were waiting through the long months that passed before the *Cuvier* and other works that they had ordered could arrive from Europe round the Cape, the rural Golgothas, in which are heaped, outside every village, the bones of dead cattle, were ransacked with new eyes, and strange zeal, in search of osteological knowledge, and any animals that they chanced to shoot were buried and *skeletonized*. Osteological plates were carefully copied, as many drawings of Baker's still remain to testify.

The discoveries of Dr. Falconer and the Canal Officers are still recognised as having opened a new era in fossil Geology. The mass of discovery was enormous. "By the joint labours of Cautley, Falconer, Baker, and Durand," says Dr. Murchison, "a sub-tropical mammalian fossil fauna was brought to light, unexampled for richness and extent in any other region then known. It included the earliest discovered fossil *Quadrumana*, an extraordinary number of *Proboscidea* belonging to *Mastodon, Stegodon, Loxodon*, and *Euelephas;* several extinct species of *Rhinoceros; Chalicotherium;* two new sub-genera of *Hippopotamus;* several species of *Sus* and *Hippohyus*, and of *Equus* and *Hippotherium;* the colossal ruminant *Sivatherium*,[1] together with fossil

[8] *Journ. As. Soc. Bengal*, iii, 593.

[9] *Dr. C. Murchison*, as above, p. xxix.

[1] A species of a new genus, of remarkable type, a ruminant, but connecting the ruminants with the *pachydermata*, approaching the elephant in size, and provided

species of *Camel*, *Giraffe*, *Cervus*, *Antelope*, *Capra*, and new species of *Bovidae*; *Carnivora* belonging to the new genera *Hyenarctos* and *Enhydriodon*, and also to *Drepanodon*, *Felis*, *Hyaena*, *Canis*, *Gulo*, *Lutra*, etc.; among the *Aves*, species of *Ostrich*, *Cranes*, etc.; among the *Reptilia*, *Monitors*, *Crocodiles* of living and extinct species, the enormous Tortoise *Colossochelys Atlas*,[2] with numerous species of *Emys* and *Trionyx*; and among fossil fish *Cyprinidae* and *Siluridae*."[3]

The bulk of the valuable spoil may be judged from the fact that Cautley's collection alone, presented by him to the British Museum, filled 214 large chests averaging 4 cwt. each.[4] Falconer's collection also eventually found its way to the British Museum. Other collections from the same source were presented to Edinburgh University by Colonel Colvin, and by Colvin and Baker to the Museum at Ludlow. For this last group, Baker in 1850 printed an instructive little handbook, which we hope may be still on sale there. A considerable part of Baker's collection is in the Museum at Calcutta, and a part was given by him to the British Museum. One great *trouvaille* of his is now conspicuous in the new Zoological Galleries in Cromwell Road, and forms perhaps the *spolia opima* of the whole Siwalik discovery—the elephant's head (*Elephas Ganesa*, Falc.) with its two vast tusks more than twelve feet in length.[5] Though broken into many pieces, every part of this noble pair was found; but the

with a trunk analogous to the tapir's, having one pair of short solid-core horns between and over the orbits, and another pair of horns on the vertex; these last of an anomalous kind, *cavicorned* with cores, as in ox-horns, but flattened and branching into three (see p. 19). The wood-cut on p. 16 represents the cranium described by Falconer and Cautley. It is from a drawing of Baker's, under which stands in his hand-writing the apt quotation from Dante (*Inferno*, xxxi, 47) :—

("Certes, when Nature put aside the art
Of fashioning such monsters, she did well.")

[2] Falconer estimated that this tortoise, from the tip of the head to the extremity of the tail, must have measured close on twenty feet, and stood seven feet in height.

[3] *Dr. Murchison* as above, p. xxviii.

[4] The cost of transmitting this collection to Europe—over £600—was defrayed by the Indian Government. The Court of Directors also, on Falconer's suggestion, presented coloured casts of the most remarkable fossils to the chief museums of Great Britain and of the Continent.

[5] 12 ft. 9 in. including the part within the incisive sheath; 10 ft. 6 in. exposed; see cut at end.

point of one tusk was stolen on its way to Dádúpur, and is replaced by an imitation.

Papers by Lieutenants Baker and Durand, on the subject of these fossils, are published in the earlier volumes of the Journal of the Asiatic Society of Bengal, as follows :—

Vol. iii, p. 638.—*Description of the Fossil Elephant's Tooth from Sumrootee, near Nahun.* W. E. B.

Vol. iv, p. 506.—*On the Fossil Elk of the Himálaya.* W. E. B.

Vol. iv, p. 565.—*Selected Specimens of the Sub-Himálayan Fossils in the Dádúpur Collection.* W. E. B.

Vol. iv, p. 694.—*Note on the Fossil Camel of the Sub-Himálayas.* W. E. B.

Vol. v, p. 291.—*Table of Sub-Himálayan Fossil Genera in the Dádúpur Collection.* W. E. B. and H. M. D.[6]

Vol. v, p. 486.—*Sub-Himálayan Fossils in the Dádúpur Collection* (chiefly Rhinoceros). W. E. B. and H. M. D.

Sivatherium Skull restored (front view).

Vol. v, p. 579.—*Smaller Carnivora from the same.* W. E. B. and H. M. D. 1 plate by Baker.

Vol. v, p. 661.—*Sub-Himálayan Fossils, etc.; Fossil Sus.* W. E. B. and H. M. D. 1 plate by Baker.

[6] This paper contains five plates of carefully and clearly drawn fossil bones, four lithographed by Baker, and one etched on copper by Durand. The Editor, James Prinsep the Illustrious, says in a note :—"In despair of the difficulty and expense of executing so many plates in Calcutta, it occurred to us that the same pens and pencils which could produce such neat original drawings, could, if provided with the requisite materials, furnish engravings and lithographs ready executed for our journal. We accordingly despatched some yellow paper and a copperplate by dâk to Dádúpur ; and these are the first fruits. If not quite perfect it is to be remembered that the transfers had to travel 1000 miles in the height of the rains, ere they could be secured on the stone, and that the copperplate, with its waxed and etched surface, had to be bitten by the acid after its arrival in Calcutta."

Vol. v, p. 739.—*Sub-Himálayan Fossil Quadrumana.* W. E. B. and H. M. D. 1 plate by Baker.

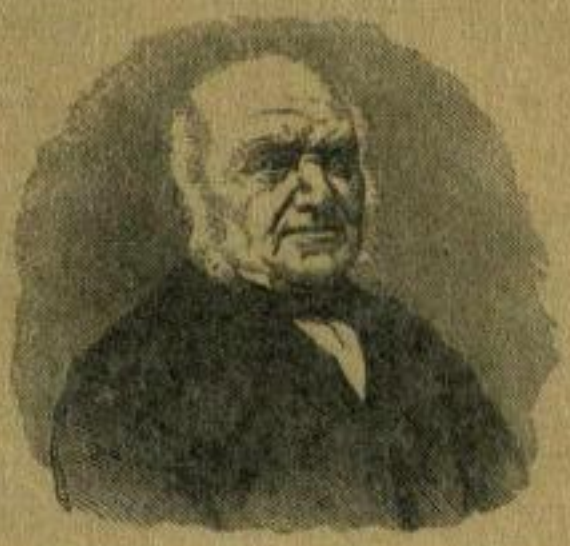
This paper derives a special interest from the reference it makes to the then imperfectly described "theory of the progressive development of organic life", and to Sir Charles Lyell's view of the inconclusive character of the evidence in support of such development, and his notice of the absence of any remains of this class of animals in a fossil state. In later editions of the *Principles of Geology* Lyell particularly notices these discoveries of Baker and Durand; as does Owen in *British Fossil Mammalia.* They are also honourably recognised in Mr. W. T. Hamilton's Presidential Address to the Geological Society for 1865, in an obituary notice of Falconer (see also Appendix II).

The discovery of a fossil monkey by Baker and Durand was a very remarkable one, and following, as it did, close upon the discovery of the first Miocene monkeys in France and Greece, it drew a good deal of attention at the time. Falconer was apparently a little sore at the credit given his friends for *first discovery* in this case. It would seem that Cautley and he had made a similar discovery about the same time, but had communicated it to England, where it was published six months later than Baker and Durand's Calcutta paper.

After a lapse of many years, we find again in the same Journal (vol. xii, p. 769), *Note on a Fossil Antelope in the Dadoopoor Museum,* by Captain William Erskine Baker, with a plate from a drawing of his. The note ends with the following passage, which we may extract as a sample of his mature style:—

"The assemblage, in one deposit, of animals differing so widely in their forms and habits, and in their adaptation to particular localities, leads irresistibly to the conclusion that we have before us the delta of a great river, which, in one of the past configurations of our globe, must have collected in its course the various spoils of some extensive continent. No existing river, excepting perhaps the Nile, could unite in one vast cemetery the remains of every known order of terrestrial mammalia and aquatic reptiles; of the denizens of the forest, the lake, and the mud-bank; mingled with those of the wide prairie and the sandy desert."

Colvin went home in 1836, and Baker, who had become his right hand, succeeded him in the direction of the "Delhi Canals", as they were then called officially; a title changed in Lord Ellenborough's time to "Western Jumna Canals". In Baker's seven years' administration of these works the revenue from them was doubled.



Portrait of Colonel Colvin, from a photograph.

The year after his succession to this charge (1837) Baker married Frances Gertrude Duncan, third daughter of Major-General Alexander Duncan, of the Bengal Army, who then commanded the Karnál Division. Not long after this his head-quarters were established at Karnál, then a great and popular cantonment, but which in 1843-44, after several unhealthy seasons, was entirely deserted. Baker's work during this period was not confined to the occupations of the canal administration, ample as these were. Thus, in February 1840, when a scheme had been suggested for connecting the Jumna and Sutlej rivers by a navigable canal, Baker, under the orders of the Governor-General (Lord Auckland) ran a line of levels between the former river near Karnál, and the latter near Ludhiána, a distance of about 100 miles.

His report and section were communicated by the Government of India to the Asiatic Society of Bengal, and published in their Journal for 1840 (vol. ix, part ii, p. 688). It is stated therein: "The information thus attained is necessarily incomplete, and though it has in my opinion proved the practicability of the contemplated measure, it has not furnished data for a detailed project, and still less for an estimate of the probable cost of the