

snow, probably the accumulation of ages; — it is in layers of some feet thick, each seemingly the remains of a fall of a separate year . . . The height of the arch of snow is only sufficient to let the stream flow under it».

In this description it is easy to recognise honest, solid glacier ice. Believing this accumulated snow to be the first appearance of the famous and true Ganges in day light, Hodgson measured it, and found it on an average to be 27 feet broad and 15 inches deep.

Then he proceeds to give some account of »this bed or valley of snow, which gives rise to the Ganges». He does not find it surprising that the melting of such vast masses of »snow» in the valley can give rise to the young Ganges. »In this manner, all the Himalaya rivers, whose heads I have visited, and passed over, are formed; they all issue in a full stream from under thick beds of snow.» He was fully satisfied that even if he had gone farther than he did in the snow bed, he would not again have seen the river, and that the place where it made its appearance, or at the very front of the bed, was the real and first debouche of the Bhagirathi.

He does not think that at the head of the surrounding snowy mountains there can be any practicable or useful pass to the »Tartarian districts». And beyond the surrounding ridges he does not believe in the existence of any still higher part of the river or any lake from which it could come, but that the ridge must mark its uppermost frontier.

Hodgson also reached the ice-bound source of the Jumna, and he intended to explore the sources of the Tonse, Satlej and Jahnavi.

Seeing crevasses in the glaciers for the first time in his life he believed they were formed by earthquakes or hot springs; he suggests that the hot springs may be a provision of nature to insure a supply of water to the heads of the great rivers, in the winter.

Hodgson was an able man and did a wonderful piece of work for his time.¹ The most interesting observation he made was that all Himalayan rivers he had seen were fed by glaciers.

The next example I would give is presented by RICHARD STRACHEY who, in 1847, visited the upper parts of the Pindar and Kuphinee rivers.² He points to the fact that the natural philosophers of Europe still considered the existence of glaciers in the Himalayas a matter of doubt.

¹ Some 60 years later his observations were confirmed by Mr. T. KINNEY, who travelled up the Bhagirathi valley in 1877—78 to supplement Mr. Ryall's survey in the direction of the Nilang valley and the Tsaprang district of Hundes. The Bhagirathi was found to form the westernmost source of the Ganges. CHARLES E. D. BLACK says: »The description given by Captain Hodgson in 1817 fully bears out Mr. Kinney's more recent account.» A Memoir on the Indian Surveys. 1875—1890; London 1891, p. 51.

² »A Description of the Glaciers of the Pindar and Kuphinee Rivers in the Kumaon Himalaya.» Journal Asiatic Society of Bengal. Vol. XVI. 1847, p. 794 et seq.