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Dr. Hann deserves, and will surely receive, the hearty thanks of all his fellow-workers in meteorology the world over, as well as of men of science generally, for giving them this invaluable new edition of a book which was already indispensable, and which, in its present still more complete form, becomes more indispensable than ever.

R. DEC. W.

**Ice-bound Heights of the Mustagh.** By **Fanny B. and W. H. Workman.** xvi and 444 pp., Maps and Illustrations. Charles Scribner's Sons, New York, 1908.

We have in this attractive volume the narrative of explorations during the summers of 1902 and 1903 among the glaciers and the high peaks of the Karakoram or Mustagh Range. The authors follow custom and use the term Himalayan after indicating that, strictly, the Mustagh lies to the northward of the western Himalayas. The approach was made in the spring of 1902 by the Vale of Kashmir and Srinagar and thence to Arandu which lies at the foot of the Chogo Lungma glacier. This ice stream, with its branches on surrounding peaks and cols, formed the goal of the exploration. The trunk glacier extends thirty miles from Arandu in a west-northwest direction. The upper half of this glacier and over fifty miles of large branches offered a virgin field to the explorers. The district lies a little to the north of the Biafo glacier which Dr. and Mrs. Workman explored in 1899.

The front of Chogo Lungma glacier at Arandu stands at an altitude of 9,500 feet, while its head marks 19,000 feet at the base of a snow col which rises to 20,000 feet. The lower nine miles of the stream are nearly concealed by jagged masses of morainic *débris*. From observation by Col. Godwin Austin in 1862 it is known that this section of the glacier has shrunk considerably in the intervening forty years. Successive lateral moraines mark the recession from the valley walls by amounts varying from 50 to 600 feet. Six parallel morainic ridges were counted at one point. The Bolucho glacier must formerly have been confluent with the trunk stream, from which its front has now receded, leaving a gap of a half mile. The middle section of the main glacier shows six well-marked medial moraines and some of these are composite. The upper section, nine miles long, marks a rise of 5,000 feet, offering first a series of séracs and ice-falls, with névé and snow on the slopes approaching the head of the glacier. There are fourteen lateral streams, of which those entering from the north seem to be waning like the Bolucho, while the southern branches show no such tendency. The Haramosh, one of the greatest of these tributaries from the south, 11½ miles long, contributes an active component of the Chogo Lungma, pressing powerfully into it at the point of junction. Crevasse glacier is of about equal length and joins the trunk glacier within four or five miles of its head. The rate of movement of Chogo Lungma was determined at two points about the middle of its course. The amount varied from about one and one-half feet per day nearer the edge of the stream, to about three feet half way across the glacier.

The most noteworthy ascents were those of Mount Chogo, 21,500 feet, and Mount Lungma 22,568 feet, and Dr. Workman's attempt upon Pyramid Peak, 24,500 feet, in which he attained 23,394 feet. These summits are close together, north of the great glacier near its head. Mount Lungma was ascended by Mrs. Workman, who thus broke her previous altitude record for women, of 21,000 feet. She has since made 23,300 feet in the Nun Kun Range, which, as is stated, places her with the small band of men who have reached a height of over 23,000 feet.

The season of 1903 took the explorers up the Hoh Lumba and Sasbon glaciers, two important ice streams lying closely parallel to each other, and heading northward on cols not far from the col that separates the Biafo and the Hispar glaciers. They later returned to Arandu and to the Chogo Lungma to complete the work of the previous season. They then went up the Bolucho and over a perilous col, with their entire caravan of coolies, down the Kero Lungma glacier, and up the Alchori to the col overlooking the Hispar glacier. They had hoped to retrace the Kero Lungma and go down the Hispar to Gilghit, but were prevented by the fears of the coolies.

The entire course for the two seasons is plotted on an excellent folding map on a scale of 1:150,000, showing well the general topography as well as the moraines and other features of the glacial system.

The story is vivaciously told and narrates with becoming modesty feats of the most difficult mountaineering. There are now and then passages of brilliant description of scenes of surpassing grandeur witnessed from points of great altitude. Pardonably, it would seem, years of conquest in the Himalaya make the Alps appear to the authors somewhat diminutive. They appreciate the freedom from man and the commonplace which mars too often the mountains of Europe.

The would-be explorer in high altitudes will find much of useful experience and suggestion, particularly in the closing chapters, which discuss the management of coolies and the determination of altitudes by aneroids and other instruments. Interesting experiences are given concerning the physiological effects of high altitudes, more especially as attempts upon high peaks and cols required repeated pitching of camp at altitudes of from 15,000 to more than 19,000 feet. Many interesting records of high sun temperatures at great altitudes are given, 100° F. being often approximated and sometimes exceeded, while the shade temperature of noon would be 55° and the night temperature 20° or even near 0°. The physiographer finds an interesting note (p. 274) on rapid weathering at high altitudes and would have welcomed fuller information on the glacial modifications of topography, and on possible former extensions of the glaciers in the valleys.

These hardy explorers have given us a story of serious adventure which on no page allows the reader to relax his interest; and the wealth of splendid views, of which some are in colour, give at least some hint of the joy of adventure and supreme toil among the wildest scenes of nature. A. P. B.

**La Basse-Normandie. Étude de Géographie Régionale. Par Raoul de Félice.** pp. 596, Map and Illustrations. Hachette & Co., Paris, 1907.

One of the thorough and admirable studies of regions in France, a number of which have appeared in recent years. In arrangement and treatment, it is a model worth the study of all writers on regional geography. The author includes in Low Normandy the calcareous "Campagnes" of Caen and Alençon, the argillaceous lands of Bessin and the ancient terrains of Cotentin and Bocage. The large volume is given to this comparatively small area. Its physical geography, dealing with geological evolution, climate, hydrography, and the general aspects and divisions of Low Normandy, is treated in Part 1 occupying 216 pp. Part 2 (331 pages) is devoted to anthropo-geography, the races and their moral and intellectual condition, peasant life, stock raising and agriculture, the extractive and manufacturing industries, ports and other commercial facilities, etc. The bibli-