

AMERICAN RESEARCH IN ASIA.¹

THIS handsome publication is divided into six sections, Prof. Pumpelly describing the "archeological" and physiogeographical reconnaissance in Turkestan, and Mr. R. W. Pumpelly the physiographic observations on the Pamir; Prof. W. M. Davis describes "a journey across Turkestan," and Mr. Ellsworth Huntington deals with Central Turkestan and with the basin of eastern Persia and Sistan.

The expedition received the most friendly help from the Russian authorities, and received its only check in northern Afghanistan. The dominant factor in the wide region examined appears to be its progressive desiccation, whereby even the irrigation works of the ancient races failed long ago to bring in water from the streams. Everywhere there are signs of old vitality, of great cities, and of peoples who accumulated wealth by trade and settled labour. Again and again, envious invaders from the south, or east, or west, have swept across the hollow lands between the mountains, and have destroyed a civilisation in order to enforce their own. The very sites of the chief towns have shifted, and the remains of the earlier settlements, deeply buried, may afford a clue to "the origin of Western and Eastern civilisations."

Prof. W. M. Davis, experienced in grasping the significance of the surface-features of a country, discusses the former extension of the waters in the Aralo-Caspian area. Particular interest also attaches to his examination of the loess. Whatever the actual origin of this finely divided material, there is no doubt as to its distribution and the moulding of its surface by wind in the eastern provinces of Semiryetshensk and Fergana (p. 63)—we adopt the spelling of the text, and not of the map which forms plate iii. Mr. Huntington also observes loess in process of formation in the Kashgar plain, and refers it here to the spreading out of very fine silt by water in the flat floor of temporary and recurrent lakes. There is in reality no contradiction between these views, since most writers are agreed that the material gathers first of all in the plains by ordinary processes of denudation, and then undergoes further sifting, the chief agent being the persistent action of the wind.

Both these authors believe that the Tian Shan mountains were worn down to a fairly uniform surface after their principal folding had occurred, and that they owe their present irregular surface more to subsequent differential uplifts than to denudation (pp. 73, 80, 168, &c.). "Even in the lofty Pamir there are certain ranges where the snowy peaks are smoothly truncated, as though by the old peneplain, in spite of the fact that they are from 15,000 to 20,000 feet high." Prof. Davis seems not to insist on so recent a date for the "peneplain" as does his

colleague, who brings forward conclusive evidence that the whole Tertiary series of the district was involved in the folding, and that the uniform degradation must be assigned to late Tertiary times. The present development of the "peneplain" in Central Turkestan seems, according to Mr. Huntington, due to the formation of ridges and basins, without conspicuous faulting. Prof. Davis, on his part, lays more stress on faults and "fault-blocks." Lateral compression, he urges, has had little to do with the raising of the block-ranges, to which our attention is now for the first time directed in this area; and he proceeds, in consequence, to consider the bearing of the Tian Shan ranges on Suess's views on horsts. He justly remarks (p. 82) that "forces of uplift are

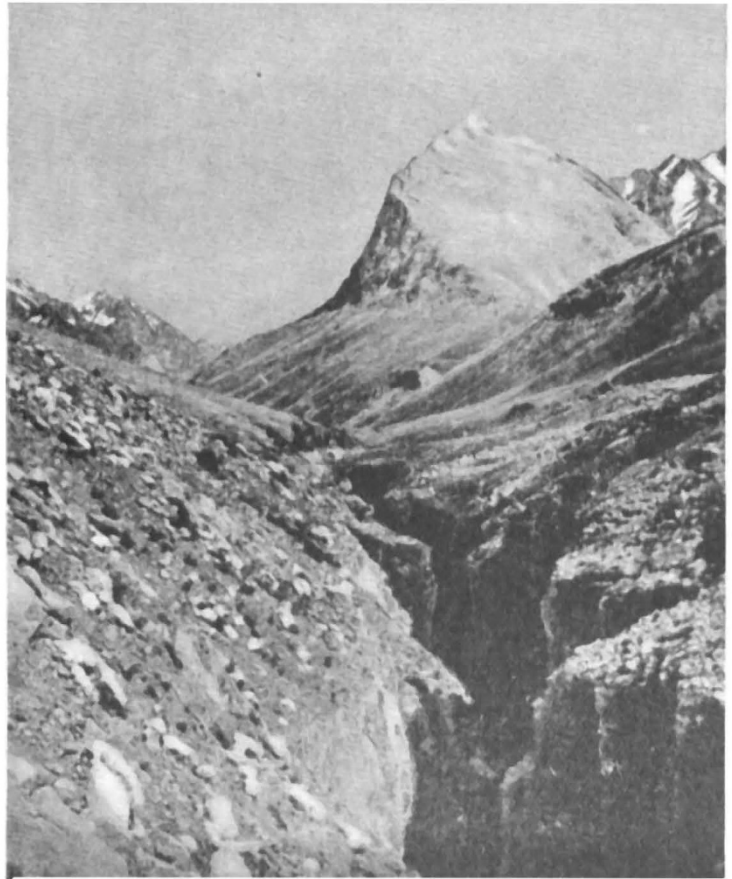


FIG. 1.—Youngest Gorge of the Khoja Ishken, cut in the bottom of the main Glacial Valley. From "Explorations in Turkestan, with an Account of the Basin of Eastern Persia and Sistan."

still worthy of consideration"; and, being himself a profound student of processes of denudation, he points out that the surfaces of many horsts must have been near sea-level before they were separated by dislocation. After all, may we not be grateful to Suess when we find discussions such as these arising naturally in a work of travel, which might in some hands have been a record of detached geological observations?

The glacial phenomena of the central ranges are described in connection with the successive areas studied, and the gravel terraces, which are well illustrated by views and sections, are correlated with climatic changes. The authors hope that subsequent

¹ "Explorations in Turkestan, with an Account of the Basin of Eastern Persia and Sistan." Expedition of the Carnegie Institution of Washington in 1903, under the direction of Raphael Pumpelly. Pp. xii+324; with map plates, and figures in the text. (Washington: Carnegie Institution, 1905.)

researches may indicate fluctuations in the Aralo-Caspian waters, in correspondence with those traceable in the rivers that flowed down from the glaciated areas. Mr. R. W. Pumpelly tried, in the short time at his disposal, to correlate (p. 143) the glacial changes with the successive shorelines traceable in the basin of Kara Kul on the Pamir, and makes the interesting suggestion that this lake rose to a height of 320 feet or more above its present level during the first local glacial epoch, and to a height of 150 feet during the second epoch, the times of greatest precipitation corresponding with the increase in the lacustrine waters. Both here and in the Alai Valley to the north, two well marked series of moraines exist. The older series in the Alai Valley is clearly indicated by being cut into by the narrower valley-troughs, with which the second and fresher series is associated. If we read Mr. Pumpelly aright—for his mode of bringing together his observations leaves something to be desired and explained—the older glacial epoch actually preceded some of the earth-movements which gave the ranges their present relations and elevations (pp. 145 and 155).

Mr. Huntington goes so far as the presentation of five glacial epochs, on the evidence of the large and high-reaching valleys which still contain glaciers in them (p. 199); and, arguing from the very probable

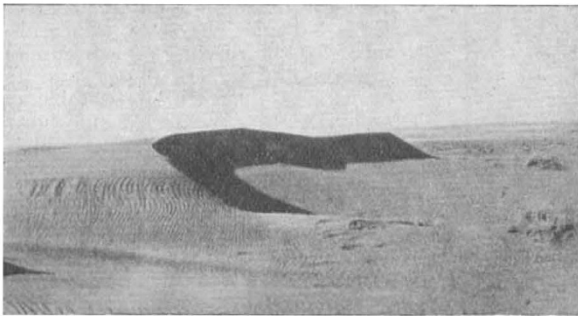


FIG. 2.—A Barkhan near Bakhar'en, looking south. From "Explorations in Turkestan, with an Account of the Basin of Eastern Persia and Sistan."

correlation of his epochs of gravel-deposition and of glacial extension higher up the country, he is inclined to ask for at least six advances and six considerable "interglacial" withdrawals of the ice. In his concluding paper on eastern Persia and Sistan, he describes what he styles "one of the most desolate lands in the world," "a land of gravel and nakedness, of huge desert basins and desolate, interminable slopes, of tantalizing mirages and bare mountains." The average rainfall does not rise above 10 inches, and comes from the south-east; while the summer wind from the north, often as violent as a hurricane, fills the air for four arid months with continental dust. The country is dealt with by Mr. Huntington as by a scientific artist, and his picturesque touch is emphasised by an occasional aphorism, such as "The desert makes men lose every sentiment except the desire to get safely to the other side." Persia is to him a "typical example of an arid country"; and he gives us a fine sketch of its life-history. He then describes in detail five series of recent river-terraces, and connects them, as we are led by this time to expect, with climatic changes, similar to those in Turkestan. The alternations in the lake-deposits of Sistan then come in for corresponding treatment, and the decay of the area in population and in political power in modern times is attributed to the final desiccation.

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We are glad that Mr. Huntington's clearly written papers close the series; for must we not admit that American physical geographers, who are apt to classify old conceptions until they appear to develop into new ones, provide us at times with somewhat difficult reading? On p. 79 we have:—"the penetration of the region improved in the final 40 miles of the road on the sixth day. In the morning some of the broad ridges . . . were from 300 to 500 feet over the intervalles." Mr. Pumpelly can hardly be a cyclist, or he would not speak of "deflated boulders" on p. 131. If, again, we all understand what dating a letter means, how shall we appreciate the phrase (p. 135) "the epochs predating the escarpments"? We make these remarks as much in the interest of the conscientious foreigner as of ourselves; for the directors of the publications of the Carnegie Institution have no right and no desire to remain content with a purely American circulation.

As examples of the numerous effective illustrations, we may mention the photograph of a characteristic crescent-shaped "barkhan" of blown sand on p. 44, and that of the glacial valley and subsequent ravine of the Khoja Ishken on p. 188, both of which are here reproduced; but all throughout are to the purpose, even when merely showing modes of travel in a region of absorbing interest.

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HABITS OF BIRDS.¹

MR. EDMUND SELOUS, the author of this elegant little volume, is one of the most patient and enthusiastic observers of bird-life in the British Islands, and has recorded details in connection with the habits of several species which have been overlooked by other field-naturalists. If the riddle of nature is ever to be solved by observations on living animals, Mr. Selous is one of the men who ought to help to solve it, although we are bound to confess that several of his theories, notably the one with regard to the origin of the nest-making instinct, do not appear to ourselves by any means convincing or sufficient. Nests, indeed, form a very favourite theme of the author; so much so, in fact, that when discussing the building of supernumerary nests by various species on pp. 67 and 199, he practically repeats the same thing, namely, that this results, originally, from a simple love of labour and occupation.

The author is, perhaps, at his best when describing the movements and actions of birds as seen during his inimitably patient watchings, excellent examples of this being shown in his description of herons alighting on their nest, and of long-tailed titmice constructing the domed receptacle in which their eggs are deposited. The latter incident is represented in one of the illustrations, photographed, like the rest, from a sketch by the clever pencil of Mr. Lodge, this exquisite picture being reproduced as a sample of the illustrations generally. As an interesting suggestion, reference may be made to the author's theory that when a woodpecker's nesting hole has been usurped by a starling, the rightful owner may occasionally lay an egg in the nest, and that in this manner the parasitic habit of the cuckoo may have been developed. The fact of starlings excavating large nesting chambers in sand-cliffs is entirely new to us.

In regard to the "get-up" of the book, we may suggest that it would have been an improvement if, instead of repeating the main title as the heading for alternate pages, the name of the species under dis-

¹ "Bird Life Glimpses." By E. Selous. Pp. viii+335; illustrated. (London: G. Allen, 1905.) Price 6s. net.