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SOME NOTES ON THE RIVER SYSTEM OF THE UPPER LIAO, MANCHURIA.

By ROBERT T. TURLEY.

THOUGH Manchuria has for many years been expected to become of great political importance, but little of a definite nature is known of its geography. Thus, a few general remarks on the Liao river may be of interest.

The main stream rises far away in Mongolia—or rather in a section which is virtually China, and just near the old town of Jehol, north-east of Peking—and thence, running north by east, enters Manchuria nearly on the 44th parallel of latitude, westward of the city of Chang-chiin-Fu, or Kuau-cheng-tzu. Both the source and mouth are almost on the 41st parallel, and thus its course actually describes a peculiarly elongated horseshoe shape. From the mountains and hunting forests near Jehol it receives much water, which it loses, to a somewhat large extent, as it wends its way slowly over the plateau. It passes through a region which until recent years was given up to nomads, but now thousands of industrious Chinese are turning the desert or wilderness into rich corn-lands for a good distance on either side of the river. Until it enters Manchuria—near the once Mongolian trading centre, now Chinese town of Cheng Chia-Tun—it passes only one town, Hada, a noted barter-market. One would venture to suggest that some explorer, experienced in Central Asian geography, should, making Hada a base, investigate the whole of Eastern Mongolia. Our knowledge is vague and uncertain, and such as we have has been gained from casual wanderers—often with but little practical experience, and mutually contradictory on important points. For example, one will describe mountains in a given district, and another will report only low hills. It will probably be found that both are partly right; thus, a traveller by rail from Shan-hai-Kwan to Newchwang would speak of mountains rising to the northwards, whilst another, journeying on the far side, across the high-altitude plains, will refer to the same as low hills, as seen from a distance and looking southwards. The same with rivers. East and west of the upper Liao are some curious phenomena. At certain places, rivers, quite wide and deep, are found in the early autumn which in the spring can scarcely be traced over the sandy wastes. Others may flow continuously to a certain point and then become extinct, absorbed in the sandy soil. Once, when travelling with a companion on the borders of the lesser Mongolian desert, which is east of the Liao, being winter, and a certain river unexpectedly in view, all frozen, we began to argue as to where it might flow, whether east or west; finally an old Mongolian came near, and we both appealed to him. He smiled knowingly, and said, “You are both wrong; it goes nowhere.” “Explain yourself,” we said. “It just runs a bit south, and then spreads out and is eaten by the sandy soil.” “How about the rainy period?” we asked. “Then,” said he, “further south there does arise from the ground much water, which flows as a sandy and treacherous river into the Liao below Hsin-min-ting.” On another occasion we met a traveller who urged us not to advance, as a river, which we should reach at sundown, would be unfordable. We, however, pressed on, and found that what had been a deep current a few hours previously, which our friend, with great trouble, had only just managed to ford, was but a shallow stream. On further investigation, we discovered that some strong intermittent springs poured their waters at fairly regular intervals down this river-bed, and thus the natives called it a tidal river. Its name is the Ta-miao-ho, and can be found to the east of the town of Ku-Lor.

The geologist would find much to interest in the curious rock-formations of the

hills—where such occur—especially the various lava-beds laid bare here and there, and volcanic sandstone in which sea-shells and water-plants can be traced by their markings; and in many a watercourse pieces of fossil wood, white and glistening, may be picked up. Whether or not the archæologist would be rewarded, one can hardly say, but I am inclined to think that buried remains of a bygone race may be found. Near Chao Yang there were some curious cists and non-Mongolic tombs, and one has a theory that a highly civilized race, from whom conquering hordes gradually emerged and swept down towards Southern Asia and Europe, once peopled this region.

The Chinese colonist of Shantung and Chih-li, whose very instinct is to destroy all trees and brushwood, finds that, once the Mongols cease to burn the steppes and when these are brought under the plough, trees will flourish. A few feet beneath the surface of the soil much moisture exists, and so willows and cotton-wood branches are planted very deeply, and these, in a few years, become fine groves of trees, which modify the air and act as a break to the terrible winds, which in springtime would, otherwise, blow the seed-grain out of the ground. Owing to the wasteful habits of the nomads, the sandy deserts have rapidly encroached on once fertile lands.

The most northern bend of the Liao river, which is formed by the junction of the Lao Ho (Khe) and Sira-muren (or upper Liao), is fully 100 miles due north of the position allotted to it on most maps, which follow the error of the cursory survey of the famous Jesuit fathers in the reign of the Emperor Kang-hsi. About lat. $43^{\circ} 50'$ and long. $123^{\circ} 40'$ the river turns almost due south, and from this bend to the sea might be made navigable for the ordinary river traffic if taken in hand at least for a few months of each year. The Government allows, however, no boats to pass above the customs station at Tung-chiang-tzu, a large emporium 100 miles further south, and near the town of Tieling, which, as a military centre, controls the river.

The first tributary in Manchuria to bring any amount of water is the Liu-ho-Yen river, which drains a considerable area between Kaiyuan and Kwan-cheng-tzu, and which is bisected by the Russian railway. Then above Tieling, about 30 miles, there is the Ching Shui Ho, and just north of Tieling the Tsai Ho, both spanned by fine railway bridges, but generally fordable for ordinary traffic, excepting at or immediately after the summer rains. From Tieling to within 90 miles, in a direct line, from the sea at San-cha-Ho, where the Hun enters the Liao, there are but small streams. San-cha-Ho is the tidal limit, and from here to Newchwang the water is always more or less muddy, though clear above this point.

The Hun is navigable for small junks from Chang Tan, a place 30 miles below Mukden. In the vicinity of this city the Hun is wide and shallow, with sandy wastes and a shifting bed. Above Mukden it is used only for down-stream rafts. The scenery is grand above Mukden, and the Fu-shun valley is especially beautiful, the scenery commencing with the famous Manchu tomb-hills and forests of the Fu-ling, where No-ar-chu, grandfather of the first Manchu emperor, sleeps.

Thirty miles west of Liaoyang the Tai-Tzu joins the Hun at Hsiao-Pei-ho, and is navigable for shallow-draught boats only to Liaoyang city. Fifteen miles west of Liaoyang the Sha-ho enters the Tai-Tzu, and is an insignificant and sluggish stream which flows, from below the railway bridge of Sha-ho-pu, between high banks, very steep, and in a narrow and boggy bed. Above the bridge there is an open and deep sandy bed, with a, usually, small stream meandering over it.

The Liao has not a single bridge of any description, and is crossed on the ice in winter, or by ferries during the open season. In its remote upper reaches it is fordable. The fish are poor in quality, few species, and small in numbers, excepting the semi-salt water varieties near the port of Newchwang.

THE MAP.—The map has been compiled as follows: The sources of the Liao—or Lao Ho (Khe)—from inquiries made by myself when travelling in south-eastern Mongolia, especially from data supplied by the Rev. John Parker (London Missionary Society), who worked the whole region. Later I sent a fairly well-trained native to gather all the information he could, and I depended on him for the section from Hada to the northernmost point. The Sira Muren is inserted from Russian sources, which are not quite reliable. From the most northern point to the mouth the river has been, on the whole, carefully sketched by myself; a few main places were fixed for latitude and longitude, etc. (the latitude is the more correct), and other details from compass-bearings. I am very familiar with the whole of the river and its tributaries from the northernmost bend to the sea. I have been much about the Eastern desert and the curious disappearing rivers.

THE MAJOR NATURAL REGIONS: AN ESSAY IN SYSTEMATIC GEOGRAPHY.*

By A. J. HERBERTSON, M.A., Ph.D.

THOSE of us who teach geography in the Universities have constantly to answer the question, What is geography? and in preparing our work we have to be quite clear about its content and scope. In this country we are less tied by tradition than in some others, for there is practically no systematic geography to bind us. In Germany the Ritter and Humboldt traditions gave rise to two schools. To America the Ritter tradition was carried over by Guyot, but a new one developed by geologists has superseded it. For long in our country geographical progress meant exploration, mainly with a commercial or political bias, and descriptive and statistical geography was taught. It was only with the rise of an academic geography that the wider conception of geography as the science of distributions developed.

In studying distributions comparisons were inevitable between geology and orography, climate and vegetation, and so on, and we were led to think that there might exist definite natural divisions of our globe. This resulted in an attempt to replace the purely political divisions of the world by others based on configuration. At this stage both the teaching and text-books gave a rational analysis of the main-feature lines as a guide to the general build of the continents, and this was supplemented by a consideration of the climatic and biological elements also for the continents. In the detailed study of each continent, however, the descriptions were applied to the various political divisions. This is found to be unsatisfactory. Why should Southern Canada be treated separately from the Northern United States? Such separation involves much waste of time, which would be obviated by a more rational subdivision of North America.

How are we to go about making the more rational subdivisions? At the outset two difficulties present themselves: (1) What characteristics should be selected to distinguish one region from another? Size is not a sufficient guide, although it must not be neglected; neither is structure, nor even configuration, although this last suggests many important divisions of the Earth's surface, which must be taken into account in any rational classification. (2) How can we determine the different orders of natural regions? The British Isles, for instance, form part of

* Research Department, February 29, 1904.