

# SCIENCE

FRIDAY, DECEMBER 17, 1920

## CONTENTS

<i>The Anthropological Problems of the Far East</i> : DR. ALEŠ HRDLICKA .....	567
<i>Surveying from the Air</i> : DR. E. LESTER JONES .....	574
<i>Scientific Events:</i>	
<i>The British National Union of Scientific Workers; Plant Pathology at the Brooklyn Botanical Garden; The American Physical Society; The Mathematical Association of America</i> .....	576
<i>Scientific Notes and News</i> .....	578
<i>University and Educational News</i> .....	581
<i>Discussion and Correspondence:—</i>	
<i>Helium and Hydrogen Models</i> : DR. EDWIN C. KEMBLE. <i>Reprints from Scientific Institutions</i> : PRISCILLA B. MONTGOMERY. <i>Observations on the Philosophy and Ethics of Research and Publication</i> : FRANK PLACE, JR. <i>The Directorship of the Maine Agricultural Station</i> : DR. CHAS. D. WOODS .....	581
<i>Quotations:—</i>	
<i>Science and the Nation</i> .....	585
<i>Scientific Books:—</i>	
<i>Howchin on the Geology of South Australia</i> : PROFESSOR ROLLIN D. SALISBURY .....	586
<i>Special Articles:—</i>	
<i>The Compression of a Sound Wave</i> : PROFESSOR CARL BARUS .....	586
<i>The American Chemical Society</i> : DR. CHAS. L. PARSONS .....	588

MSS. intended for publication and books, etc., intended for review should be sent to The Editor of Science, Garrison-on-Hudson, N. Y.

## THE ANTHROPOLOGICAL PROBLEMS OF THE FAR EAST<sup>1</sup>

THE white man is quite liable to forget that the Far East is a very great part of the world; that it is, in fact, a more populous and greater world than his, and one which has perhaps quite as many and important problems of its own. But it is difficult to realize these things unless the student actually visits the Far East, and by Far East I mean the entire eastern half or rather two thirds of the Asiatic continent with the adjacent oceans. Once you enter these territories you are in a vast human beehive; you see on all sides of you peoples of interest; peoples who must have their history, their antiquity; peoples who must have many problems the solution of which is connected with and would be of value to the rest of the world. When, as an anthropologist, you have been in these regions for a length of time, you begin to see a light, very dim at first, which shows you these problems, so far as our own field is concerned, are divisible into two large classes: into the more *comprehensive* ones, which involve very large groups of humanity and the large questions, and into the more *particular problems*, which are proper to the different individual ethnic groups that occupy those territories.

I shall speak first of all of some of the more individual problems, but it may as well be stated at once that with these or the larger problems I shall not be able to do more than to present mere outlines for your contemplation; more thorough definitions and the answers to the problems are matters for the future.

It will be handiest to take up the particular questions geographically, and begin with the north or rather the northeast. And here we

<sup>1</sup> Lecture delivered before the 548th meeting of the Anthropological Society of Washington, October 19, 1920.

encounter first a fairly large group of people who present physical and other features that in many respects ally them closely with the American Eskimo. They are the Chukchee and related tribes. Those who have seen living representatives of these people, or only their portraits, and who at the same time know our Eskimo, could not but have been struck forcibly with not merely the close resemblance, but the physiognomic and general physical identity of the two groups. But what is the real connection between them we do not know. It would of course be easy to jump over the bridge and say that both people sprang from the same stock, but that would be an opinion, not a demonstration. We know that in early historic times the Asiatic "Eskimo" traveled over the Behring Straits on to the St. Lawrence Island and probably to the American side of the straits; and we also know that some Eskimo from this side traveled in the opposite direction, but that does not yet establish their identity. A good deal of creditable work has been done on the Chukchee by Russian scientists, but the actual determination of the main facts is still in abeyance and the whole constitutes one of the attractive problems of anthropology for the future.

Another interesting ethnic group in the Far East about which we know but little, even less than about the Siberian "Eskimo," are the natives of Kamchatka. They are not so much like the Eskimo, although we find amongst them individuals who approach Eskimo physiognomy more or less; but one may perceive among them again and again the physiognomy or an approach to the physiognomy of the American Indian. Recently a Swedish expedition with, as reported, ample means and intending to stay in the field for at least two years, has proceeded to the peninsula with the object of studying the people as thoroughly as possible; but the group should be and will probably have to be studied as well by Americans who are well acquainted with the Indian.

As we proceed farther south we come to another interesting group of people now

almost extinct, which however to this day presents its problem to anthropology, and these are the Aino. It is often supposed that the Aino are native to little more than the island of Yezo in Japan, but that is an incorrect localization. They occupy to this day parts of the Kuriles Islands and Saghalien, and they occupied in early historic and prehistoric times the entire Japanese archipelago, excepting perhaps the southernmost portions. Here are people who differ considerably in their physique from both the Chukchee and the more Indian-like people of the Kamchatka peninsula. They evidently have in them a considerable mixture of white blood; in addition to which they unquestionably have also a proportion of yellow-brown, the stock which now prevails over all these regions. It is known that they occupied the Japanese archipelago before the Japanese reached that country, though they may not have been there very long: and there are some indications that their inflow into Japan may have been from the north. But all this is still problematical, together with their influence on the actual Japanese, and calls for further investigation.

Another interesting group or rather conglomerate of people in the north of the Far East, are the Tunghuz. These can no more be regarded as a single tribe. They embrace, from the physical standpoint at least, people of decided differences. The Tunghuz of the south are unlike the Tunghuz of the north. The southern Tunghuz, or at least certain groups of them, resemble the American Indian so much that the student can not but be struck most forcibly by the fact. It is such a resemblance, in color, physiognomy and all features of the body, that we can not but feel there must be here an identity of stock, and a unity in perhaps not a very far distant past. These tribes are now in their decline, and they are crying for a thorough investigation from every anthropological standpoint. True, there are some Russian accounts of them, but they are only partial, insufficient. It would seem self-evident that in a case of such important disappearing people we should have casts as well as plenty of photographs and

measurements in order to preserve the characteristics of the group to science and history, for in another generation or two they will be completely mixed up and extinct. They are going rapidly like many of our American tribes and unless promptly studied we shall before many years long in vain for satisfactory records. Here is a problem which calls for immediate attention, a problem of much more than a local or even only Asiatic interest, something indispensable to American anthropology; and one remembers with pity the recent resolutions relating to the problems of the Pacific made at the Congress of Hawaii, among which questions like this were wholly forgotten.

A little farther south, we come to still another interesting and important group, in the process too of becoming anthropologically spoiled by amalgamation—the Mongolians. The term “Mongol” applied to many of the Asiatic peoples is of course a misnomer, much as when we call all white people “Caucasian” or “Aryan.” The Mongolian people who extend over a large region to the south of Lake Baikal, and admixture with whom is very evident in some parts of China, are, like the Koriaks and the Tunguz, remarkable for the frequent occurrences among them of types that resemble, and at times resemble to the point of identity, the American Indian. Besides this, you will find among the Mongolians not a few indications of admixture with white people. You will find, especially in the western part of the territory, individuals with blue eyes and brown hair and white skin. And in southern Mongolia the people have become mixed with other branches of the yellow-browns that do not so much resemble the American Indian. Here surely is a stock that calls for investigation, not merely physically but also linguistically and in other directions. They speak five chief dialects or languages; they sing songs that are purely Indian in sound and character, and they do many things like the Indian. One night, being absorbed in my work, and hearing a Mongolian pass, singing as he went, I just simply became confused; it seemed I must be some-

where in America amongst the Indian tribes. Whether the words were alike I do not know, but the sounds were identical. They are like the Indians in many habits—for instance, you will find piles of rocks in the mountain passes accumulated through ages by the traveling Mongols, precisely as you may see in parts of our Sierras where they have been piled up by the Indians; and they do exactly as the Indian does when he reaches the summit of the pass—they take up a pebble, offer a short prayer, spit on the stone, pass it over their legs, return thanks that they have reached the summit, and pray that they may reach the end of their journey in good strength and safety. This is exactly what the Pueblo Indian does in our southwest, or the Peruvian Indian in the Andes. And this is but one instance out of many such resemblances between the Mongolian and the American Indian. They extend to personal and even religious observances, notwithstanding the fact that the Mongols have long been converted to Lamaism, one of the most exacting and intolerant of religions. So here again there is a series of problems which urgently calls for investigation, and they are problems connecting directly with the American, and hence calling for the student well acquainted with the American Indian.

We come now to the more cultured and better known groups of the Japanese, Koreans, Chinese, Indo-Chinese, Burmese, Hindu, etc., and every one of these groups teems with problems that need investigation.

Take Japan for instance. To this day the origin of the Japanese people is in considerable haze. It is supposed that their main line of ancestors, in all probability of mixed Tunguz derivation, came about 1,000 years B.C. or a little over, from somewhere in eastern or northeastern Manchuria, and very likely also southeastern Siberia. But it is also perceptible in Japan, especially among the female children, that there has been some infusion of an Eskimo-like type. In all probability the “Tunguz” carried with them some elements of the Asiatic Eskimo. You may find little girls in the streets of Tokyo

to-day who have perfect Eskimo features, and you will find this feature occasionally in the adults as well. The Japanese know it, but whether they are not willing to admit it, or simply have not pronounced themselves upon this point, they have never offered any explanation. It seems that the invading stream was derived from a large part of the north-eastern region, that after passing around or through Korea they reached the main island of Japan, settled then by the Aino, and that possessing better military art and weapons, they prevailed over the Aino partly by uniting with them and absorbing them, and partly by destruction. The Aino have survived only in the north, and to-day not only are they few in number but it is practically impossible to find a full-blood among them. But this was by no means all of the origin of the Japanese. Before even the Aino came, there apparently was in the southern portion of the islands a neolithic population. The Japanese collections contain now some skeletal remains of these people, and these show that even then there was already a diversity, though the general type is that of a yellow-brown people, who must have penetrated into southern Japan at that time from Korea or the continent. And there is another element, not traceable so far historically, that apparently came from the south. Whether it came from Formosa, or from the Chinese coast or even from the Philippine Islands is not known, but some facts would point to the Philippines rather than to Formosa. This southern element is responsible for bringing into Japan certain cultural features, and physically a few traces of the Negrito. To this day you will find Japanese—rarely yet occasionally—who bear physical traces of negrito admixture. They are it seems ashamed of it. The Japanese anthropologists are aware of the fact, but it has received no further attention. In addition there was a more important influx of Chinese and Koreans, and also since early in historical times there was a slight influence of whites. Just what part these different elements played in the building up of the Japanese people remains to be determined. Also,

there are still many old mounds and sites in Japan that demand careful exploration. The Japanese anthropologists are slowly working in these directions, but they must necessarily lack the perspective that could be brought to the field by the American student. For this and other reasons it would be better if scientists from this continent as well as from other parts of the world would participate in the work.

The Koreans too, present a field for much further research. Though yellow-browns, they are a distinct people from both the Japanese and Chinese. They resemble greatly some of the more western Russian Tartars. The Japanese in general, for political reasons, are rather anxious to convince the Koreans as well as others, that the Koreans are the same as themselves, but the scientific observer sees readily substantial differences, at least as large as are those between the Koreans and Chinese.

In China itself there are still many problems for anthropological investigation. In the first place is the origin of the great Chinese people, counting to-day between three and four hundred million individuals. We know that their ancestors came from somewhere in the northwest; that they mixed with people already in the country, the so-called wild tribes and others; that later they impinged upon and perhaps mixed slightly with the Negritos of the south. But none of this is as yet fully cleared or established, and there are many other questions. There are in southwestern China groups some of whom are not yellow-brown but rather Indonesian or of Hindu derivation, much nearer to white people than the Chinese. We find also considerable physical and other differences between the Chinese of the north and the Chinese of the south. These remain to be investigated. There are large districts where there are remains in the nature of mounds, or burial caves, or sites, which have hardly yet been touched. Also there are unknown tribes in the western mountains. Some of these tribes have been mentioned by explorers, but none have been investigated anthropo-

logically, and what is true of the western part of China is even more true of the neighboring Tibet. The southern portions of Tibet are the least desirable anthropologically because they are the most mixed, and they have been investigated to a certain extent by the English. The real Tibetans live more in the center and towards the northeast of the great region, and among them again one finds the physiognomy of the American Indian.

South of China are masses of mixed population; but there is one prevailing group that needs careful attention, and that is the Malays. These people are found in Borneo, in Java and the rest of the Malay Archipelago, in the Philippines and elsewhere, besides on the continent, and we still lack a knowledge of them which would enable us to say precisely what they represent, and which would enable us to join them more directly to other branches of the yellow-brown people.

Here in the south we find too one of the most enigmatic of all the now existing groups of humanity, namely the Negrito. There are indications that at one time the Negrito occupied a very much larger territory than he occupies to-day, that he was in other words a much more important anthropological group than he seems to be now. There are to this day Negrito settlements in the little islands off the southeast of Formosa; there are traces of them in southern China, and more in Burma and Indo-China; they people the Andaman and the Nicobar Islands off the coast of India, and there is a large remnant of them in the Philippine Islands, especially on the island of Luzon. But they, or traces of them, exist also in New Guinea, and in many of the islands of Micronesia, Melanesia and even Polynesia. Therefore the opinion is justified that the Negrito at one time, before and during the influx of stronger peoples from the northwest, played an important part in the peopling of Asia. But we still do not know just where to place the Negrito. Is he allied to the African Pygmy? or is he a separate development? That he has some connection with the Negro is certain, but how can this connection be explained? And when and whence has he reached the territories

he peopled? If any human group should be thoroughly known, it is surely the Negrito; but he is receiving nowhere near the attention that he deserves. Here again there is a fertile field for investigation.

As we proceed eastward we now approach the great group of Polynesians. This is the particular group that is just now receiving so much attention; but I am afraid that some of this attention will be misplaced, for it can not lead to any great results. In the first place it is well known that the peopling of Polynesia is quite recent; in the second place nothing has ever been found on all these islands that would justify a belief in anything more ancient. Furthermore, and this is perhaps the most important, any one who has had any direct acquaintance with the Polynesians must readily have recognized that they are a mixed people. There are individuals among them who resemble more or less the American Indian, while others represent more the Malayan type of yellow-browns; there are those who clearly approach the white man; and there are numerous individuals who bear traces of the Negrito or Negro. Now, a mixed population of this nature, and of recent historical derivation, can not yield a great deal to anthropological research. There are undoubtedly problems of interest in the study of the Polynesians, but when we contrast them with those of the rest of the Far East, we can not but perceive that the Polynesian problems have not a primary importance.

A more important set of problems are those relating to Australia. We have heard much about the "Australian race," but it is very doubtful if there is any such thing as an Australian *race*. If we compare the natives of one part of Australia with the natives of other parts, we see such differences that physical unity can scarcely be contemplated. They have of course been territorially circumscribed and they have intermixed; they have numerous customs in common, though they also differ in this respect; but they are probably not one people. They have commonly been talked of as "the Australian"; they should rather be dealt with as the "Australians." The anthro-

pologists have further sinned against the Australians by classing them as but little higher than the anthropoid apes. Because some of them present various primitive features, such as marked supraorbital ridges or pronounced prognathism, they have been placed on the lowest rung of the human scale. This is not yet fully justified. The Australian demands a lot of new careful, unbiased investigation, and he demands it urgently for he also is disappearing—not by amalgamation, although that also exists in some parts—but through habits and diseases introduced by the white man.

From Australia there is but a step to Melanesia, which too, presents its problems; the main one being perhaps the advent into these regions of the African Negro. Most if not all the groups show individuals who are regular types of the African Negro in physiognomy, character of the hair, stature and all other respects. This is a big negro, not the small Negrito who was evidently always small and whose diminished stature with slender limbs has made him conspicuous even in admixtures. The type represented here, aside perhaps of some Negrito, is the real African. But how did Africans come into these far away islands? They never were navigators of any note. Were they brought there by others, perhaps the Egyptians or the Arabs? We do not know as yet. It is another problem of the Pacific. And there are others in Melanesia.

Then there are the many problems of the people of the Indies. As yet we do not know exactly what the Indian populations represent, or just how and when they came. There was a stream of "Aryans," but who were they? And just who anthropologically are the Dravidians, the Ceylon Vedahs and the other groups of importance? We see on one hand a large Mediterranean strain. There are many people in India who, if placed in a more northern climate for a few years, would so closely resemble the southern Italian that they could not be told apart. There are other Hindu who resemble the people of Afghanistan, or those of Persia, southeastern Russia, and perhaps even the Nordics of Europe. Again there are undoubted and numerous semitic elements, and

then of course there are the mixtures of the Malays and other yellow-browns, and those of the Negrito. Here are many problems that await and deserve a careful further anthropological investigation.

So much in a very superficial way about the more *particular* problems of the Far East and the Pacific. There are plenty of them and they claim our special attention because as Americans we are directly interested in the eastern Asia which gave us our Indian. But these parts of the world present some greater, more *comprehensive* problems of the most stimulating and absorbing interest, which can not be solved fully before many of the particular questions shall have been answered, but which must be kept before our mind.

The first of these more comprehensive problems is that of the origin, derivation and time of coming of the yellow-brown stem of humanity. Here is a multitude of people, enough to fill three times over and more the whole American continent as it is now populated, who, though they extend from the farthest north down to the equator, present nevertheless many characteristics in common. They are not of the same color, but are all yellowish-brown, ranging from yellowish-white down to brown-black. They have all the so-called Mongolic eye, especially in the child; they are all characterized by a scarcity of beard, by black or brownish-black and wherever unmixed, straight hair, which shows also certain microscopic features that differentiate it from the hair of the rest of the human family; and there are still other characteristics that unite these people. They must all have proceeded from the same stem. But where did they originate? How, why and when did they people Asia? How did they become so subdivided and acquire their secondary differences? Notwithstanding the fact that they show so many characteristics apart from the white man, yet they show much more resemblance to him than to the blacks. There is no line of demarcation between the whites and the yellow-browns, as there is between the browns and the blacks. What is the meaning of all these facts? Here

is surely a great field for scientific determination.

But the greatest and most comprehensive of all the problems of the Far East and the southern archipelagos, is that of man's antiquity in these regions. We know that since the Tertiary these regions were and still are inhabited by anthropoid apes. We therefore have had there forms near to man since at least the Pliocene period. In the island of Java have been discovered the remains of a creature that is the closest to man of all non-human forms thus far known. Whether this being was directly ancestral to man or not does not matter; the point is that many things indicate this region as the possible site of man's earliest differentiation, of man's origin. But the truth in the case remains to be determined. Explorations in this field have thus far barely touched the surface. There are vast promising deposits, and almost endless numbers of caves that demand exploration. Of all the fields of anthropological research here is the most pregnant. And it lies fallow.

Connected with the preceding is the problem as to why early man has not populated the mainland of eastern Asia. In all this part of Asia, extending to the Turkestans, there has not been found thus far a single object which would unquestionably point to man's geologic antiquity. The objects thus far discovered over these vast regions are those of the Neolithic period, and apparently not even the oldest parts of the Neolithic. The man who occupies these territories is not allied with anything primitive; he is not very substantially different from the white man; he is more related to the white man than to the blacks; his origins point westward, not southward. The only conclusion that one can reach is that the region which is now known as China and the continent to the north of this, had never been peopled by early man, for which there must have been weighty reasons. On closer analysis it is possible to reduce these reasons to two only—either early man never was in southern Asia; or he was there in the south but was prevented from reaching farther north by insurmountable, for him, natural

conditions. The fact that no trace of anthropoid apes has thus far been found in central or northeastern Asia would somewhat favor the second hypothesis. The barrier to the extension of these apes northward may have been the same that prevented a similar extension of early man or the human precursors. Though it is also possible that early man developed in the south but much farther westward, maybe even as far as the African continent. All this is to be determined. Yet certain facts indicate that, whether early man did or did not once exist in southern Asia, there did exist towards the north a barrier that might have prevented his spread in that direction. A large portion of China is covered by a peculiar Quaternary geologic formation, the so-called loess. The loess is generally poor in fossils, and geologists in China have inclined to the opinion that during the deposition of these accumulations the great region thereby covered was probably not as habitable as it is to-day; that it did not offer sufficient resources for man or many animals; that the loess formation may represent conditions such as exist in the Turkestans or southern Mongolia at this day. It appears to represent a region where the alluvia left after overflows of the rivers after they dried were disseminated by the winds and came to form the earth's surface under semi-desert conditions. But the actual facts are still to be established. This only shows how great is the need of actual investigation, geological, paleontological and from many other points of view, in these regions.

Such are at least some of the more *particular*, as well as the more *comprehensive* problems of the more eastern parts of the Asiatic continent, presented in a simple and meager manner. My object is merely to show how necessary it is for American anthropology to pay more attention to the Far East. The time has come when we must cease to be provincial. I would like to see our institutions establish proper research stations in eastern Asia where local workers could be trained for investigation in anthropology and related branches. And I would like to see the American men of science as well as others, help to establish for

China and India, the two most important centers, national Museums of Natural History which would serve as centers of anthropological, biological and geological investigation of the Far East.

ALEŠ HRDLIČKA

U. S. NATIONAL MUSEUM

### SURVEYING FROM THE AIR

THE great possibilities of airplane photography in connection with the water and land work of the Coast and Geodetic Survey are looming up as a potential factor in expediting the mapping of our waterways and interior surveys. This very important subject has been the object of careful study and experiments by officers of the Survey, in collaboration with the other branches of the government, during the past year and the rapid advance in aerial photography, first seriously undertaken during the war, now promises, with proper development, a method of surveying that will probably far exceed expectations over the old methods in rapidity, economy, and minuteness of detail.

No little stress should be laid on the fact that, not only are the possibilities good for an early and complete revision of our shore topography, but the opportunities that present themselves for assisting materially in our hydrographic work shouldn't be underestimated.

With the necessary facilities and cooperation supplied by the Army and Navy Aviation Corps to the Coast and Geodetic Survey, experience has already proven the value of aerial photography over the old method of surveying in revision surveys of our coast lines.

This work so far, is divided into two branches, *Aerial Photo-Topography*, and *Aerial Photo-Hydrography*, and the results are shown in the following recent practical demonstrations:

#### AERIAL PHOTO-TOPOGRAPHY

In July, 1919, experiments were made at Atlantic City, N. J., to ascertain the adaptability of airplane photographs for use in

topographic mapping. The area in the vicinity at Atlantic City was chosen as it is characteristic of so much of the coastal plain territory of the Atlantic coast. This project was essentially experimental in character, but developed into one of practical value, as the photographs are being used in a revision of the charts of the New Jersey coast.

This work was done in cooperation with the Air Services of the Army and Navy. Both land and sea planes were used, and in addition several photographs were made from a dirigible. Three types of mapping cameras were tried out, the "L" type, K-1, and Trilens. An officer of the survey kept in close touch with the work and furnished the ground control, constructing special targets in some cases.

A mosaic was constructed by members of the Air Service of the Army, using the photographs made with the K-1 mapping camera. These were taken at an altitude of 7,000 feet, using a lens of 10 inch focal length, with a resulting scale of about 1:8,000. A rough control scheme was first laid out, and the mosaic constructed over this.

This mosaic and also the individual photographs have been the subject of study by engineers of the survey, especially with reference to control and interpretation. Various methods of reduction for chart use were tried out. A study was made of the accuracy of mosaics and individual photographs. The possibilities of control using the photographs themselves to establish a graphic triangulation, have been investigated. The most important point brought out from the study of the results of the work at Atlantic City, was the possibilities in revision work, especially along those sections of the Atlantic coast where the shoreline is subject to frequent changes owing to the action of the sea.

#### AERIAL PHOTO-HYDROGRAPHY

At the same time that the experiments at Atlantic City were being made, a distinct line of investigation was being pursued at Key West, Florida. Photographs were made by the Naval Air Service to determine the pos-