

BRIEF NOTES ON RECENT ANTHROPOLOGICAL EXPLORATIONS UNDER THE AUSPICES OF THE SMITHSONIAN INSTITUTION AND THE U. S. NATIONAL MUSEUM

By Aleš Hrdlička

DIVISION OF PHYSICAL ANTHROPOLOGY, U. S. NATIONAL MUSEUM

Received by the Academy, November 22, 1915

In the April and July (1915) numbers of these PROCEEDINGS I have given notes on 'Some Recent Anthropological Explorations' carried out under the auspices of the Smithsonian Institution, and on 'An Exhibit in Physical Anthropology' which was prepared on the basis of these explorations for the Panama-California Exposition; I will now complete the account by referring in brief to the scientific results of the several expeditions made in this connection.

The field work was directed towards three main objects, namely, the securing for this country of original specimens relating to earlier man in Europe and Asia and contributing thus to the advance of knowledge in this direction; the initiation of comparative study of the child among primitive peoples; and the search in Asia for possible traces of the ancient stock of humanity which gave us the Indian; while an additional aim was to complete as far as possible our collections of skeletal material bearing on prehistoric American pathology. Some of the results of these activities have already been published, at least in a preliminary form (see bibliography, April number), and need not be referred to again at this time; while the remainder can be summarized as follows:

Search for Neolithic Human Remains in Southwestern Russia.—It is well known¹ that southwestern Russia and particularly the province of Ukraina, is rich in mounds or 'kurgans,' which yield human remains dating from the early historic back into the neolithic period. It is the region which in the past has yielded bones colored red,² and also some crania of most interesting form, partly transitional with those of geological antiquity. The exploration was entrusted to Prof. Kazimir Stolyhwo, Chief of the Anthropological Laboratory at Warsaw, and was restricted to the district of Kiev, in the vicinity of the villages of Szulaki, Puhaczówka, Chejtowa, Zywołówka, Tackowica, Zacisze and Horodnica.

The total number of Kurgans explored was thirty-three, twenty-seven of which yielded human remains, which, however, in the majority of cases had been disturbed. The mounds averaged close to 90 feet in diameter, the range being from approximately 40 to nearly 300 feet; and nearly 5 feet in height, or from less than a foot to nearly 8 feet. Most if not all of the tumuli were originally higher, being reduced in the

course of time by agriculture. The tops of several of the mounds were covered with stone, which must have been brought from a distance. The number of human burials encountered in these mounds was upwards of 70. They were located generally about or not far from the center of the mound and at varying depths, from a few inches to nearly 15 feet beneath the summit. Some of the burials were plainly intrusive. The old burials included individuals of both sexes and all ages. The bodies were as a rule in moderately contracted position. In the majority of cases the bones were colored more or less red, due to the inclusion in the graves of red ochre. The mode of burial differed. In one mound it was by incineration of several individuals; in others a fossa had been made in the surface of the ground, in which the body or bodies were placed, the grave being covered by a low shelter of wood, about and over which was piled the soil from the immediate neighborhood. In still other instances the body was simply buried in the earth. Most of the mounds contained also traces of ceremonial fire and of animal bones, some of accidental inclusion, but some probably from offerings. The archeological remains were scarce, though many may have been removed by treasure hunters previously. With two skeletons, in two separate but adjacent mounds, there was found iron; with three or possibly four, were traces (stains) of brass or copper; with one a small ornament of gold; with six there were old articles of bronze such as ear pendants and bracelets; with six there were objects of bone, such as heads, or artificially perforated teeth of carnivores; with two burials there were implements of stone, and fourteen of the mounds yielded primitive hand-made pottery. The older skeletal remains of man are of special interest. Although in poor condition, they show a uniform dolichocephalic type of people, of good stature; there is no evidence of any superposition of types or even mixture until we come to relatively recent burials. The animal bones recovered from the various mounds comprise those of three or four species now extinct in these regions, namely: *Bison bonasus*, *Equus* (prob. *gmelini*), *Ochotona pusilla*, and *Marmota bobak*; and those of some of the common living ungulates and carnivora, a few birds, with a variety of rodents. Detailed report on these finds is in preparation by Professor Stolyhwo.

Explorations in the Birusa caves and rock shelters on the Yenisei River, Siberia.—During my trip along the Yenisei River in 1912, my attention was forcibly attracted by a large number of caves showing from a distance in the cliffs of a wild region about the mouth of a small stream known as the Birusa, on the left bank of the river about 50 miles south of Krasnoyarsk. The whole locality is known as Birusa and, as I

learned later, some of the caves and nearby tumuli have been previously explored in part by M. Jelenief of Krasnoyarsk, who discovered in them remains pointing in particular to the Neolithic period. As the whole region west of the Yenisei in this latitude is very rich in mounds and other remains of old populations, some of which are known to date back to the Neolithic period, it seemed most desirable to subject the Birusa caves, as far as possible, to scientific exploration, and the work was intrusted to Professor Stolyhwo, who the year before explored the mounds in Ukraina. The work was carried out during the latter part of the summer of 1913, but was greatly interfered with by adverse weather and other unfavorable conditions. Nevertheless, excavations were completed in three of the caves, four rock shelters and one mound. The results were more encouraging than conclusive. With the exception of few teeth, no skeletal remains of man were discovered; but the caves and shelters yielded numerous traces and examples of bone and stone industry. A detailed account of this exploration also is being prepared for publication by Professor Stolyhwo. Careful and extended exploration of the region is most desirable. The many remaining caves about the Birusa and the thousands of mounds over the steppes to the westward, only a few of which have as yet been touched, invite urgently the hand of the archeologist.

STUDIES ON THE DEVELOPMENT OF THE CHILD AMONG PRIMITIVE PEOPLES

The Negrito.—In 1912, after receiving due instructions, Dr. Philip Newton of Washington, D. C., was sent to the Philippine Islands to study the child among the Negrito. His stay in the Philippine Islands extended over 103 days, of which however only 65 could be spent in actual field work, the remainder being taken up by travel, storms and by illness incurred in the unhealthy environments. During the trip more than 1000 Negritos were seen, of whom 400 were measured and observed. These included 348 full bloods and a little over 50 mixed bloods. The mixed bloods represented mostly the Bataks of the Island of Palawan; the full bloods were in the main from Luzon. Among the pure bloods examined, there were 75 children. The rather small proportion of children to adults was due to the fact that many adults came for the examination for some distance, without bringing with them their families, and partly to the fact that the number of children per family among the wild Negrito is exceptionally small.

Photography and particularly cast making met with serious difficulties, due to the tropical climate and great moisture. About 300 photographs were nevertheless taken, 70 of which, however, were ruined when

the boat carrying the expedition was upset during a severe storm on the Cagayan river. As to cast making, although plaster was taken along packed in supposedly air tight cans, when these were opened it was found to have absorbed so much moisture that it was quite useless; and an additional supply purchased in Manila yielded no better results. Collection of skeletal material also met with considerable difficulties. The people, and hence their burials, are widely separated, and when the latter were found the bones, in a large majority of cases, due to the excessive moisture, were in such poor condition that they could not be collected; twelve graves yielded few parts only of a single skeleton.

A great obstacle encountered in the examination of the Negrito children was the absence of reliable data as to their ages. Nevertheless, the series is an interesting and valuable one and can be confidently expected to throw light on a number of important features of the child's development among these exceedingly primitive people, who besides live in a highly specialized environment. The data are being prepared for publication.

African Negro.—Perhaps the most important large ethnic group for anthropological studies, particularly those on the child, is that of the pure African Negro, and an expedition of over 14 months' duration was carried out under my direction, among several of the more favorably situated tribes of this race, by Dr. A. Schück, of Prague. Principal attention was given to the Zulu, from South Natal to North Zululand, and the results are measurements of upwards of 1000 children and adolescents of this people. These children were reached through the various Mission schools and in nearly all cases the age could be exactly determined. The results of the measurements and observations, which are already in an advanced stage of preparation for publication, are expected to afford a solid basis of data concerning the child development of the pure blood negro of good stock, which in the future should be of considerable value in connection with studies on the development of our own colored population.

Besides the Zulu, the expedition reached a limited number of the Bushmen and was engaged on the tribes in British East Africa, including some pygmies, when the outbreak of the war in Europe brought the work forcibly to an end.

Besides measurements and observations, the results of this expedition consist of numerous photographs; a series of excellent facial casts of the Zulu, and an especially valuable series of 20 facial casts of the Bushmen. There were also made on this trip numerous collateral observations of physiological and medical nature.

The Eskimo.—About the most exceptional environment under which man lives is that of the Eskimo, and it would seem that if anywhere, it would be among these people that the effects of environment on development should be encountered. This decided me to send an expedition to one of the largest and for purposes of research the most favorably situated groups of these people, namely that of St. Lawrence Island. This island lies, as is well known, in Bering Sea, approximately 40 miles from the Siberian and a little over 100 miles from the nearest point on the Alaskan coast. The work was entrusted to Mr. Riley D. Moore, D.O., aid in my laboratory in the National Museum, and after due preparation he left for the Island in the spring of 1912, returning late in the autumn. He found the Island inhabited by 292 full-blood Eskimo, of which he measured and examined 180, including a majority of the children; with young infants the mothers objected to all handling. Fortunately, as among the Zulu, the ages of the children could in a large majority of cases be exactly determined, the Island having for years had the advantage of a Government school; in consequence the data secured can not fail to be of considerable scientific value, and are being gradually prepared for publication. Besides the measurements and anthropological observations, the expedition secured a good series of photographs of persons of all ages, a series of facial casts, a collection of skeletal material, and much general information.

Native Siberians.—In addition to the above researches, it was planned to examine into the development of the Australian child and the Chinese. Unfortunately neither of these plans could be realized, but instead it became possible to send a well qualified observer, Dr. S. Poniatowski, chief of the Ethnological Laboratory in Warsaw, to some of the tribes in the Primorskaia province of East Siberia. Unfortunately this expedition, undertaken in 1914, was broken up by the war; yet measurements were secured on 109 Gols and 25 Orochons, including a good number of children. Numerous photographs were also taken, but only one facial cast could be made on account of prevailing apprehensions regarding the purpose of the work. It was hoped that this expedition could be resumed during the fall and winter of 1915–1916, but present conditions make this impossible.

On the whole, then, we have succeeded in securing an excellent series of data on the children of the African negro; a valuable though not large series of similar data on the Eskimo child; a series of some value on the child of the Negrito; and some data among the native tribes of eastern Asia. I may add that we have already a good series of similar observations, made by the same methods, on the Indian child.³ It may there-

fore be stated that, notwithstanding the many difficulties in the way of such studies among primitive peoples, there have been made some serious beginnings in this very important line of anthropological investigation. As to detailed results, nothing can be said until a careful and necessarily tedious elaboration of the data is completed.

The third main object of anthropological field work under the auspices of the Smithsonian Institution during the last three years was the search in Asia for *probable traces of the ancient stock or stocks of mankind, from which the American Indians were derived*. On this subject a number of preliminary reports have already been published⁴ and it is unnecessary to do more in this place than to state that such traces undoubtedly exist in Asia to this day, that they extend over a very large territory, and that they are soon to receive further attention by the Smithsonian Institution.

¹ See bibliography in A. A. Ivanovskiji, *Ob Antropologičeskom Sostavě Naselenii Rossii*, Moskva, 1904.

² See Hrdlička's *The Painting of Human Bones*, etc. *Smithsonian Inst. Rep.* for 1904.

³ Published in *Smithsonian Inst., Bull. Bur. Amer. Eth.*, No. 34.

⁴ Symposium on The Problems of the Unity or Plurality and the Probable Place of Origin of the American Aborigines, *Amer. Anthropol.*, 14, No. 1, Jan.-March, 1912; Restes, dans l'Asie orientale, de la race qui a peuplé l'Amérique, *Congrès International d'Anthropologie et d'Archéologie préhistoriques, Compte Rendu de la XIV Session*, Genève, 1912; Remains in Eastern Asia of the Race that Peopled America, *Smithsonian Inst., Misc. Coll.*, 60, No. 16; The Derivation and Probable Place of Origin of the North American Indian, *Proc. XVIII International Congress of Americanists*, and the Genesis of the American Aborigines, *Proc. II Pan-American Sci. Congress*, Washington, 1916.

A THEORY OF NERVE-CONDUCTION

By Alfred Goldsborough Mayer

DEPARTMENT OF MARINE BIOLOGY, CARNEGIE INSTITUTION OF WASHINGTON

Presented to the Academy, November 16, 1915

This research is a continuation of the studies reported in these PROCEEDINGS, 1, 270, May 1915, and it will therefore be unnecessary to redescribe methods of experimentation. These later experiments were made at the Marine Laboratory of the Carnegie Institution of Washington at Tortugas, Florida, in July, 1915, and the kymograph records were studied in detail in a room which the writer was privileged to occupy in Guyot Hall, Princeton University.

In the experiments of 1914 the distilled water contained between 10^{-5} and 10^{-6} H ion concentration due to carbon dioxide, thus giving an excess of free H ion. The endeavor was therefore made in July, 1915, to obtain neutral distilled water in which both the H and the OH ion concentration approached 10^{-7} . Accordingly, following the suggestion of