



DESCRIPTIVE CATALOG
OF THE
SECTION OF PHYSICAL
ANTHROPOLOGY

PANAMA-CALIFORNIA
EXPOSITION

1915

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I. INTRODUCTION

Physical Anthropology (anthropos—man) may be most briefly defined as comparative human anatomy; or, a little more comprehensively, as that branch of science which deals in a comparative way with the physical man and his functions.

It embraces:

1. The study of man's natural history, or his evolution as an integral part of the animal kingdom;
2. The study of man's development and growth, and his normal decline, or senescence, with the variations in the same, in different parts of the world and under different conditions;
3. The study of man's varieties or races and all other physical groupings, and of individual variation within such groups;
4. The comparative study of man's pathology and his death, both in time and geography;
5. Man's evolution in the future, with its possible regulation or control.

This field though large is very definite; it is also of a peculiarly intimate and general human interest; and while the science of anthropology is of a relatively recent existence, it has already rendered much service to humanity. Thus, it has placed on a firm and well documented basis the facts of man's gradual ascent from lower organic forms; it has classified all living mankind as well as many extinct people; it has defined the main differences existing between the different races of man; it traced the laws which control growth of the human body and development of its main parts; and it has thrown much light on the processes of heredity in man, on the effects of environment on his system, and on the causes of his differentiation in general.*

*Consult the writer's "Physical Anthropology and Its Aims," Science, 1908, p. 33; and "History of Physical Anthropology on the American Continent," specially printed, from the American Anthropologist 1914, for the San Diego Exposition.

II. BRIEF HISTORY OF THE EXHIBITS

As may be seen from the preceding, Physical Anthropology constitutes not merely a highly absorbing field of study, but also a sphere which should lend itself to most interesting and instructive exhibits. It was in appreciation of this fact that, in 1912, Dr. Edgar L. Hewett, Director of Exhibits, with Col. D. C. Collier, then President of the Panama-California Exposition, called on the writer for plans of what could be accomplished in this line before January 1st, 1915, the date set for the opening of the Exposition.

When the proposition was taken up, it was seen at once that there would be but little precedent to follow in the planning and formation of the exhibit. No comprehensive exhibits in Physical Anthropology had ever been attempted, though at a number of expositions, from that in Paris (1878) to that in Dresden (1911), the subject of Man received considerable attention and there were sections devoted in part to Anthropology. The scheme of the contemplated exhibit would therefore have to be original. It was further realized that available data and material were not sufficient for larger systematic high-class exhibits, and that a number of collecting and scientific expeditions to different parts of the world would be necessary in order to supply these deficiencies. Thus the plans had to be extended to include a large amount of field work.

The general scheme was finally reduced to what appeared the most practicable form and was thus accepted by the representatives of the San Diego Exposition. In order to secure rigid attention to the many important details, insure the highest value of the exhibits, and safeguard the administrative and financial details of the large undertaking, an agreement was reached between the Exposition and the Smithsonian Institution, whereby the latter undertook the disbursement of the funds allotted for the work; and the writer was intrusted with the actual carrying out, as far as feasible, of the plans that were accepted. In compensation for the various facilities afforded by the Smithsonian Institution and the services of the writer, the U. S. National Museum was to profit by such scientific data and material, gathered on the proposed expeditions, as would be left after the wants of the Exposition were satisfied.

The plans decided upon comprised, in brief, original exhibits, of permanent Museum value, covering as far as possible the whole scope of Physical Anthropology as outlined in the Introductory paragraphs of this Catalogue. They were to be housed in five connected rooms and to illustrate man's origin in the light of modern science, his relation to the rest of the animal kingdom, and, in comparative manner, his life cycle and its variations. It is gratifying to know that in the main these plans have been realized. In some particulars untoward circumstances, and especially the European war, have interfered with the work, in a few directions preventing even the attainment of such completeness in the exhibits as was contemplated; but these deficiencies, of which only the Preparator will be fully conscious, have already been partly compensated for and will be further done away with during the course of the Exposition.

To get the needed original and thoroughly authentic documents, photographs and casts, with skeletal and other material, visits were made to all the more important European museums, and expeditions were organized to ancient mounds, caves and cemeteries, as well as to the most primitive living peoples in different parts of the world.

A brief enumeration of the actual field work accomplished may be of interest. It included the following:

(1) Search for the skeletal remains of ancient man, in central and southeastern Europe, and in the basin of the Yenisei River, Siberia, prosecuted with the able and generous assistance of Dr. J. Matiegka, Professor of Anthropology and head of the Anthropological Institute, Prague; Professor A. Rutot, Director of the Musée d'Histoire Naturelle at Brussels; and Professor K. Stolyhwo, head of the Anthropological Institute at Warsaw. Part of the results of this work are the two valuable originals of neolithic crania, the only specimens of their kind on this continent, exhibited in room 1 (Human Evolution). The collection and exportation of material of this class is now prohibited in most European countries. One of these specimens is particularly precious, showing ancient trephining. Only a very few examples of this remarkable surgical operation from the neolithic time are in existence.

(2) Visits to those European Museums which contain either noteworthy anthropological exhibits, or in which are preserved some of the well-authenticated remains of Early Man, with trips as far as possible to the sites of the discovery of such ancient remains, by the Preparator. As the result of these journeys there were secured first-hand accurate casts in plaster, carefully colored after the originals, of the most important crania and other osseous remains of geologically ancient man; a series of highly artistic and yet scientifically executed busts representing Quaternary man at different stages of his evolution; and numerous other exhibits shown in room 1.

(3) An expedition to the natives of southern Siberia and Mongolia, by the Preparator; and to eastern Siberia, by Dr. S. Poniatowski, a Polish anthropologist of note. The results of these trips (the latter of which was interfered with by the war), are the large busts of Mongolians in Room III, with the series of transparencies of Mongolians and Siberians in the same room, showing the remarkable and important resemblances between many of the Eastern Asiatics and the American Indians. These resemblances are thus brought for the first time to the public attention by authentic documents.

(4-7) Expeditions to the Eskimo, by Riley D. Moore, Aid in the Division of Physical Anthropology, U. S. National Museum; to several tribes of Indians, by F. Micka, the modeller for this exhibit; to the Negrito tribes of the Philippine Islands, by Dr. P. Newton, Demonstrator in Anatomy, Georgetown University, Washington, D. C.; and to the Zulu, Bushmen and Pygmy negroes, in Africa, by Dr. V. Schuck, a prominent anthropologist of Prague, Bohemia. The last part of Dr. Schuck's trip was seriously affected by the war, the Doctor being arrested, imprisoned, and finally deported before he could complete his collections and conclude his work. He suffered the loss of his whole outfit as well as personal belongings. The material results of the expeditions enumerated in this section consist of many first-class casts, photographs and busts, forming the bulk of the exhibits in Room III. In addition the data collected on these and the Asiatic trips are largely embodied in the various charts in Rooms II, III, and IV.

(8) Another important expedition was made to the ancient ruins and cemeteries of Peru, for the purpose of obtaining skeletal material for various exhibits, particularly such as would illustrate the prehistoric pathology and surgery of the American aborigines. This expedition, by the Preparator, yielded rich results which contribute largely to the exhibits in Room IV. These exhibits represent by far the most complete display of native American material of this nature,

and are of special medical and surgical as well as anthropological value.

Besides the sending out of the above expeditions, collaboration of prominent foreign scientific men was secured in the preparation of anthropologic charts, maps, and other exhibits; and the great anthropological collections of the United States National Museum were drawn upon, through exchange for necessary material. Through the good offices of Professor Rutot, of Brussels, the assistance of the eminent Belgian sculptor, M. Mascré, was secured for the preparation of the valuable series of busts in plaster for Room I; and one of the ablest modellers in this country, Mr. F. Micka, was employed permanently, with assistants, in preparing under the writer's direction the very important series of busts and casts shown in Rooms II and III. These busts are made from actual casts of the face and body of the many subjects, with the help of careful measurements, and are all therefore accurate racial records the value of which will steadily increase with time.

III. DESCRIPTIVE NOTES

Room I. Man's Evolution

No subject within the whole range of scientific research possesses superior human interest to that of man's origin. Every advanced religious system, every school of philosophy, and the scholars of all countries and ages have wrestled with the great problem, only to reach some undemonstrable conclusion or dogma, or give up the solution of the mystery as impossible. Science itself in the beginnings could not do much better. The foremost naturalists of the last century and above all Darwin, arrived at the bed-rock deduction that man was an inseparable member of the animal kingdom, and that in common with all other species he must have arisen from other forms by some sort of evolution; but beyond analogies and the evident impossibility of any other mode of his origin, they had little tangible to show in support of this conviction.

For a period of thirty years, however, and particularly within the present century, matters have changed remarkably. Contemporaneously with the more precise and definite determinations by geology and paleontology of the age of the various strata of the earth, particularly on the continent of Europe, it was learned that in certain localities some of the more superficial, yet ancient strata held traces of man's presence, included in the deposits at the time of their formation. Such traces consist of worked stones, remains of fireplaces, broken or used bones of long extinct animals, and other objects shaped or used by intelligent beings. Thus it was shown conclusively that man occupied the European continent for many thousands and tens of thousands of years before the beginning of what is known as the historical era.

But there have come to light from time to time even more convincing evidences of human antiquity, namely, fossil remains of man himself. Skull after skull as well as other bones of the skeleton have been discovered, and under conditions which enable men of science to establish their great age beyond a reasonable doubt. As the result of the gradually accumulating evidence what was before merely a web of plausible theories respecting man's origin, has taken the form of a range of well ascertained facts. Today these traces of early man, archaeological and anatomical, already are so numerous and well authenticated that it is possible to demonstrate, not merely to the scientific world but also to the intelligent public, whole phases of man's antiquity. The problems of man's evolution are no longer con-

fined within the realm of speculation. The record is substantial and unassailable, even though still imperfect in details; it becomes clearer and more amplified every year, and it already extends not merely to the very ancient representatives of man himself, but even to some of the more immediate of his precursors.

In brief, the facts now in possession of science make it clear that the views of Darwin, Wallace and Lamarck, regarding man's ascension from lower forms, were substantially correct. It is ascertained that the further we go back along the course of man's physical progress, the more simple appears his intelligence, the more primitive, the less human, his features. When we reach the oldest specimens now known, namely the jaw of Piltown, the jaw of Mauer, and the Java skeleton, there are serious uncertainties as to whether we still deal with early man, or already with his forerunners. Farther back than these last named remains, we as yet lack material, which naturally must be exceedingly rare. But the space not yet covered is already less than the biological distance from the earliest to present man. A step farther backward along the line which is now laid out with practical certainty and we are carried down to beings that could only be characterized as anthropoid primates. It is from beings of this class that man must have differentiated.

It must not be understood, however, that man has ascended from any species of monkey or ape now existing, although his ancestry has doubtless passed through stages equally lowly. There is no reason to believe, in fact there seems no possibility, that any of the present monkeys or anthropoid apes are older than man. They manifest neither a marked stability of type, which might be taken for a sign of considerable age of the species, nor any tendency to vary in the direction in which man progressed. They are at most man's more or less proximate relatives, but not the parent stocks from which he sprang. The family of primates from which man gradually differentiated is doubtless long extinct, as are all man's more immediate precursors and probably even some of his earlier races.

The exhibits relating to the great subject of man's evolution from the standpoint of Physical Anthropology, occupy Room No. 1. They are, as already mentioned, not only original, but also more complete than any hitherto attempted in this line. They comprise, in brief, the following series:

1. Ten highly artistic busts, made by M. Mascre, and under the direction of Professor Rutot, representing man at different stages of his evolution. While artistic, these busts are at the same time as true to nature as it was possible to make them. The heads and faces are built up on the casts of the actual skeletal remains of each individual represented, and the various utensils, decorations and other objects introduced, are exact reproductions of those found with the bones. Descriptive details concerning these exceedingly interesting human forms will be found in one of the Monographs placed at the entrance to the Section.*

2. The next series of exhibits in this room is a collection of accurate casts of the most important skeletal remains of Early Man thus far discovered. All these are copies of carefully made casts of the originals and show the exact coloring of the latter. An equally complete and exact set of these casts is to be found nowhere on this con-

*The most ancient Skeletal Remains of Man. By Ales Hrdlicka. Specially printed for the Panama-California Exposition from the Smithsonian Report for 1914.

tinent, except in the United States National Museum, and in two or three European institutions. Many of these casts are supplemented by reconstructions of the respective skulls, prepared under the direction of Professor A. Rutot, of Musee National of Brussels, one of the foremost European students of man's antiquity.

3. There are wall illustrations, showing the localities of discovery of the principal ancient human remains. These are enlargements of photographs or of the original drawings and are collectively exhibited for the first time.

4. Charts, relating to geology and stratigraphy, so far as these relate to man's evolution, and those showing the possible lines of ascent of man, after the foremost authorities. And,

5. A series of pictorial representations of Early Man, by noted scientists and artists, as well as by the ancient (late Paleolithic) man himself.

To these exhibits belong also properly a series of original crania showing in general a progression of forms from the lemur to man. This exhibit must not be taken as representing the line of man's evolution. That line, as already stated, is in all probability long extinct in all its branches. The exhibit illustrates, in something like ascending biological order, the species that now connect man with the rest of the animal kingdom.

IV.

Room II. Development of the Human Body

The term **Evolution** is applied as a rule to the process of man's differentiation from lower forms, in the course of the ages, or to his **Phylogeny**; the term **Development**, relates more exclusively to his individual life-course, or to the sum of the normal organic changes which takes place in his body from the moment of the fecundation of the ovum to the reaching of the fully adult stage, in one word his **Ontogeny**. After the development of any part of the body had been completed, there is a shorter or longer stage of relative stability, and then sets in more or less gradually and irregularly the normal Decline, Senescence, or Involution.

All these vital processes progress under definite, fixed laws; and these laws of development with their results, while remarkably alike in all parts of the inhabited globe, show nevertheless racial and environmental variations, to ascertain which is one of the main objects of Physical Anthropology. The whole subject is naturally involved in many scientific details and technicalities, which do not lend themselves readily to material display; nevertheless there are parts of the field which can be illustrated to advantage and a series of exhibits relating to these will be found in this room.

The fundamental features of the exhibits in this group are three series of thoroughly true-to-nature busts, showing by definite age-stages, from birth onward to the oldest persons that could be found, and in both sexes, the three principal races of this country, namely, the "thoroughbred" white American (for at least three generations in this continent on each parental side), the Indian, and the full-blooded American negro. These series required two and a half years of strenuous preparation. They form a unique exhibit, for nothing of similar nature has ever as yet been attempted in any other country. Each set consists of thirty busts, fifteen males and fifteen females, and extends from infants at or within a few days after birth, to the oldest persons

that could be found. The oldest negro woman is 114. After the new-born the stages are 9 months, 3 years, 6, 10, 15, 20, 28, 35, 45, 55, 65 and 75 years, and the oldest individual that could be found. The utmost care was exercised in ascertaining the age, particularly among the negro and Indian. No choice was made of the subjects beyond that due to the requirements of pedigree, age and good health. The whites and negroes were obtained with a few exceptions in Washington and vicinity, but their places of birth range over a large part of the eastern, southern and middle states; for the Indian the Sioux was chosen, a characteristic and in very large measure still a pure blood tribe, also one in which the determination of the ages of the subjects was feasible. Two expeditions were made to these people by Mr. Micka, the modeler. In the case of the new born, it was actually necessary to wait until they came; and even then the mothers would not permit the modeler to approach before certain observances were attended to. A grateful acknowledgement is due in this connection to the Bureau of Indian Affairs, the kind help of which alone made the work possible.

All the busts in these three series, except those of the new-born, are made from actual and high-grade casts of the face, ears, and in some instances also the neck and upper part of the thorax; the new-born alone were modeled, the process being controlled by accurate measurements, with the baby lying in front of the modeler. The modeling required three days with each infant. In the older subjects the individual, in addition to sitting for the cast, would return for repeated sittings until every dimension and every line of the bust were correct. The series of whites includes representatives of eminent American families; the males commence with the new-born son of Dr. Wiley.

In the wall-cases of this room (II) will be found exhibits illustrating the development of the brain, of the skull, the lower jaw, and the more important bones of the body from the third month of the intrauterine life onward, in some cases to very old age. With the exception of the brain series, which consists of casts in wax and plaster, all of these exhibits are originals.

The charts in this room give in a condensed and readily understood form the principal available data relating to senility, and will later be supplemented by those showing the growth of the child.

V.

Room III. Man's Variation

After attaining his full development, the human adult shows extensive physical differences or variation. This variation is sexual, groupal, and individual.

The sexual variation is that which is found between the normal men and women of any human group. The differences are those of mass, form and function; they exist, in more or less pronounced form, in every organ of the body; they manifest themselves throughout life; and they are much the same in all parts of the world.

A number of original exhibits relating to the more readily demonstrable sexual differences will be found in the wall cases of this room, and some of the wall charts eventually to be placed here will also relate to these phenomena.

The groupal variation in mankind is very extensive and important. It is manifested, though not in the same degrees, by both sexes and at all ages. It first becomes evident between families; then between distinct occupational and environmental groups; and finally between tribes, between the types or strains, between the subraces, and between the main races or stocks of man.

The most marked and generally interesting group-variations are those observed between the main races, and those among the subraces. The principal races may be defined as the main physical streams of humanity; the secondary or subraces are the important tributaries of these streams; and the types are the main affluents of these tributaries.

There are three great main races, the **White**, the **Yellow-Brown**, and the **Black**. These terms, based on the most obvious characteristic of man, his skin-color, are not perfect, and leave two or three groups that are hard to class, but they are the simplest. Each one of these main stocks is divisible into a number of secondary races, and each of the latter into two or more types.

Excepting the types, which are more technical conceptions and are usually reserved for strictly scientific discussions, the above classification is dealt with in the light of the most modern views, in several of the charts in Room III.

The main exhibit in this connection is that of twenty large busts showing typical representatives of ten of the subraces, five of the yellow-brown and five of the black stock. These busts, like those in Room II, are made with one or two exceptions from the actual facial and body casts of the various people, and are true in every detail. The casts were made, in some instances at much cost, on special expeditions for the Panama-California Exposition. Of the ten pairs those representing the yellow-brown peoples include a typical male and female of the Indian, Eskimo, Formosan, Malay, Mongolian, and the Polynesian Maori; while the series of blacks include the Negro (Zulu), Bushman, African Pygmy, Philippine Island Negrito, and the Australian.

Racial variation is further illustrated in this room by twenty-four series of smaller and six large transparencies, made from photographs gathered in the main by the expeditions for the San Diego Exposition.

Individual variation comprises the differences among normal full-blood representatives of one race or group. It differs in extent from part to part of the body, being relatively limited in such characteristics as the color of the skin, eye or hair, but almost endless in the details of physiognomy, the lines of the palms or soles, and the various proportions of the body. It represents an extensive field of interest and yields itself readily for the purposes of exhibition.

Room III includes also, so far as space permits, a number of series of objects and charts illustrating this phase of physical anthropology. One hundred and six facial casts are exhibited in the upright cases of this room. These are all originals, taken on the special trips for the Exposition, and include the Eskimo, Bushmen, Zulu, and several tribes of Indians. The Indians are represented largely by prominent individuals of the race. Though stained only conventionally, these casts demonstrate well both the tribal resemblances and the extensive individual variation.

Among the wall case exhibits relating to individual variation, special attention is called to the several plaques which illustrate the variation of individual bones, and particularly to those which show the cross-sections of the long bones. The latter represent selections from many hundreds of skeletons of whites, and show that in each bone the variations are divisible into a number of distinct groups, which are of racial and other significance.

Other instructive and original exhibits in Room III comprise several sets of skulls and facial parts showing the main cranial, nasal, and other types. One of the sets represents the three main and well

known cranial forms, namely, dolicho-, meso-, and brachycephaly, or narrow, medium, and broad vault. A dolichocephalic skull is one in which the greatest breadth of the vault is less than or not over 75 per cent of its greatest length; in mesocephaly this percentage, known better as the **cephalic index**, ranges from 75.1 to 80; while in brachycephaly it exceeds 80. The extreme limits of normal variation in the cephalic index reach, however, from approximately 65 to over 90. By the cephalic index, which is one of the most persistent of cranial characters, the anthropologist is greatly assisted in the classification of mankind.

Another exhibit shows the **microseme** (low) and **megaseme** (high) orbits, and still another a **leptorhinc** (narrow) and **platyrhinc** (broad) nose, which are two more characteristics of value for anthropological classification. This is particularly true in regard to the nose or nasal aperture. The leptorhinc nose is in general characteristic of the white race, the mesorhinc (moderately broad) of the yellow-brown, and the platyrhinc of the black. Geographically, on the whole, the breadth of the nose increases from the north towards the equator.

Still another set of crania in this room shows the three main types of shape of the vault, the pentagonal, elliptic and rounded. There are other modifications of this nature, but the three shown are the principal. They have some value, also, in racial classification.

Sexual variation is shown by a series of sets in the right wall case. The bones are Indian, but the difference between male and female specimens in the whites are the same.

A number of crania, also, in the right wall case illustrate the subject of artificial deformation of the head. These deformations bear important relation to American anthropology, hindering greatly our work. They are divisible into unintentional and intentional. The unintentional, or simple cradle-board deformations, consist of various grades and forms of flattening of the occiput or back of the skull, and are due solely to long continued pressure of the infant's head against the resistant head cushion. Such deformations are most common among the Navaho and Pueblos. The intentional deformations were due to habits brought to this continent in early times and originally, doubtless, of religious nature. They are of two main varieties, the "flat-head" and the "Aymara." The "flat-head" was produced by the application to the infant's forehead of pressure by a plank or one or two pads; the "Aymara" form (so called after the main tribe that practiced it) was on the other hand produced by an application to the head of the new born of a band, which passed over the forehead and the occiput.

Still another exhibit in this Room (III) not belonging strictly to the main series in the same, are five ancient Peruvian mummies, four children and one young adult female, in one of the upright cases. These specimens represent the form of burial most common in the highlands of Peru and Bolivia during the Incaic times, and the bodies have become mummified in caves or stone burial towers by the action of the dry air alone. No artificial mummification such as practiced in the late dynasties in Egypt have thus far been found in Peru, or anywhere else on this continent.

VI.

Room IV. Man's End or Death, Illustrated in the Main by Prehistoric American Pathology. Pre-Columbian Surgery.

The main organic function of the adult being, throughout the animal kingdom and including man, is procreation, which is to insure the continuance of the species or race. When this most important of functions is accomplished, and in some respect even before completed, there commence in various organs of the body gradual changes which collectively institute the process of senescence, natural decline, or involution, of the organism. This process is progressive and leads towards the elimination of the living unit that has finished its biologic role, and is no more necessary in what may be called the system of organic economy. The setting in and rapidity of the progress are subject to wide individual and probably also some group or racial variations; and a number of charts, already mentioned, as well as other exhibits in Room IV relate to these manifestations.

Senescence follows very seldom a normal uncomplicated course; in the great majority of instances it is hastened, or cut short, by intervening diseases. The main diseases of mankind, their geographical distribution, and the mortality from the same, are illustrated in Room IV by several charts and a series of colored maps.

For Americans, and for medical men in general, a subject of great interest is that of the diseases that have existed on this continent among the aboriginal tribes before the advent of the whites. To obtain a complete knowledge of the same is of course hardly possible; but many of the pathological processes of the prehistoric Indian have left their traces on his bones, and if enough of these could be had for examination, we could expect to obtain fairly clear and extended information of the prevailing morbidity and causes of death among those aborigines. There is only one region on this continent which offered to the medical man hopes of success in this direction. That region is Peru where up to recent times, due to the cupidity of the common people, a great many of the prehistoric Indian cemeteries have been excavated to obtain the pottery, ornaments, etc., that were buried with the bodies. As a rule in these cases the skeletal remains found in the graves would be left scattered in and on the sands, to be slowly destroyed by the elements. Many hundreds of such despoiled cemeteries existed along the Peruvian coast up to a very recent time, and the unequalled occasion was utilized for the San Diego Exposition. In 1913, the writer made an extended trip along the coast and into the mountains of Peru.* Scores of old cemeteries and burial caves were found and all the exposed skeletal material, consisting of approximately 4,800 crania and a very large quantity of other bones of the skeleton were examined for pathological conditions. All the interesting specimens that were still in fair condition of preservation were secured, and they now form in Room IV a rich and valuable, in fact unique, exhibit in prehistoric American pathology.

*For a detailed report of this journey see "Anthropological Work in Peru in 1913, With Notes on the Pathology of the Ancient Peruvians," Smithsonian Misc. Collections, Vol. 61, No. 18, Washington, 1914.

Included with the pathological specimens are a series of sixty crania, from the western mountains of Peru, showing in many forms old operations on the skull, or trepanations. These operations, it was learned conclusively, were performed for purely surgical reasons. The people fought with arrows, clubs, maces, and slings, and the resulting wounds of the head, if not fatal, left generally impressions or other lesions in bone, which often must have given rise to serious symptoms. The medicine men of the ancient Peruvian (and some other) Indians learned in some way that by removing the depressed or partly driven-in bones, they would relieve the symptoms and not seldom even cure the patient completely, and from this there was but a short step towards a systematic practice and further development of such operations. In many cases these operations were remarkably successful, as shown by the absence of signs of infection, and the growth of normal bone in and about the wound; in other instances the edges appear clear cut and show little or no sign of healing. In some of these latter cases the subject was in all probability operated on too late, or as a last resort and did not survive, while in others he lived but a few days or weeks, dying from the results of his original injuries. The trepaning was done with stone, obsidian or copper knives, and was effected by scraping, cutting, sawing, or drilling (very rare) the bone, or by combination of two or more of these methods. No part of the vault was evidently considered too dangerous for an operation; and on some skulls there are remains of two and even more trepanations made at one or at different times. When the hole made was very large and the brain tended to protrude, a stopping plate, made of a gourd, shell, and in rare cases even metal (silver), was used. To deaden the pain of the operation the natives of Peru and Bolivia used doubtless coca leaves, the chewing of which was habitual in these countries. Besides this, the Indians possibly knew and used other analgesic or narcotic plants.

VII.

Room V. Anthropological Laboratory.

This Room is not strictly one of exhibits, but forms a necessary complement to the permanent exhibits of this section. Nevertheless a modern anthropological laboratory embodies features of such character as to make it of itself an interesting subject to many visitors.

The essentials of a well-equipped Laboratory are, besides the more ordinary furniture, a rich special library; an ample modern instrumentarium, including machines for mathematical computation; installed anthropometric outfit ready for use; and suitable metal cases for bibliographic cards, for the collection and exhibit card catalogue, and for maps and photographs. A fitting addition on the walls are enlarged portraits of the founders and old peers of the science; while necessary supplements consist of specially fitted rooms for photography and plaster work, and others for reception, preparation, study and storage of material.

Such a Laboratory, so far as it could be installed in the available space, and under existing conditions, will be found in Room V. The library includes several full sets of anthropological periodicals now seldom found complete. The instruments, partly and for the time being placed in Room II, are the most precise and handy now in use for measurements on the living man and his skeletal remains; though

the collection is not quite complete, the receipt of several consignments, including the so-called Martin set, having been delayed by the war. The metal and other cases in this room are all of American make and the best in their line. The twelve wall portraits of the patriarchs of Physical Anthropology include several eminent Americans, photographs of whom are now difficult to find.

The anthropometric outfit is precisely such as that in constant use in the Laboratory of Physical Anthropology in the United States National Museum. In addition, there are shown six expedition boxes, such as are used on the writer's journeys, every feature of which has been developed and tested by extensive field use. These boxes, many of which may be carried on a trip, require to be as far as possible impervious to rain, and durable; also large enough to hold late instruments, cameras, supplies, etc., and yet not too otherwise unsuited for convenient transportation by any variety of pack-animals. They are readily loaded and made fast, and when unloaded serve promptly as kitchen, pharmacy, chairs, table, a windbreak, or with a sheet of canvas over them as a tent in inclement weather. Their importance to the success of an expedition in wild country cannot be overestimated; while on the return they usually serve to accommodate the collections. The seventh box is one of a lot used by the writer for fifteen years and has been with him, without repairs, on expeditions to southwestern United States, Mexico, South America and Mongolia. It shows externally the effects of these journeys in being thoroughly soiled, but otherwise it is still in a very serviceable condition.



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