The Races of Man

Robert Bennett Bean

Highlights of Modern Knowledge

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THE RACES OF MAN

Differentiation and Dispersal of Man

By Robert Bennett Bean, M. D.

PROFESSOR OF ANATOMY, UNIVERSITY OF VIRGINIA

Highlights of Modern Knowledge

PHYSICAL ANTHROPOLOGY

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To
Aleš Hrdlička
whose assistance in revising
the manuscript of this book
is deeply appreciated

THE HORSEMEN OF THE STEPPES

From an old engraving

CHAPTER I

GENERAL SURVEY

"The proper study of mankind is man."—POPE.

THE history of the past has great interest for the modern man because it illuminates and interprets the present. Investigations to discover the ancient life and movements of races are not made merely to obtain information, important as that may be. There is a deeper and more far-reaching purpose. By revealing the past life and experiences of man, and by tracing his development step by step throughout the ages, the oneness and unity of all life is made clear and the character and importance of our common humanity take on new meaning. To understand the facts and ideas of the past and their relation to the present is to greatly enlarge man's mental vision, wonderfully enrich his imagination, and broaden his human sympathies. Therefore, modern man is becoming more and more interested in obtaining a larger and a more sympathetic interpretation of the facts of his own life on the earth in order to clarify his ideas and to arrive at some intelligent understanding of the history and meaning of human existence.

The story of man—how and when and where the various races originated and how they spread over the earth, the nature of the cultures, the differences, resemblances, and relationships of the various peoples, their activities and thought—is a subject of universal and absorbing interest. But more than this, this study is vital to a true appreciation of our modern social order and to a correct perception of the evolution of man himself.

We must keep in mind, however, that man has not yet reached the summit of his career or of civilization. Man is still in the making, and while he lives in a vastly different world from that which engaged prehistoric man, and to some degree is a different kind of man, nevertheless what he now is has largely been

derived from the past—not from a portion of the past or within narrow geographical limits, but from all the past centuries of life and experience.

We can readily see, therefore, how the study of mankind (anthropology) affords us a common ground of understanding, and how it gives us a fuller knowledge and a more comprehensive view of human life and progress.

The Nature of the Subject

Anthropology is a subject which embodies both the cultural and physical characteristics of man. The cultural side includes philology, or linguistics, and the customs, habits, and religions of man, with folklore and archeology. The physical side includes comparative human anatomy, physiology, psychology, pathology, the chemical characteristics of different races and groups of men, as in the blood and other fluids, and paleontology, the study of remains of antiquity.

We see that this is quite a wide range of subjects, yet it does not include all that come into relation with man. History is the written word or symbol, but archeology or paleontology may afford a more nearly correct account of the past life and certainly of the past types of man. A study of man's literature is but a study of his psychic life. Indeed, every sphere of human knowledge touches upon anthropology.

This book deals with the physical side of man only, but it will be written in vain if it fails to make clear that the study of the differentiation of man and of his evolution in the formation of races,* with their distribution over the world, is a subject of ever broadening human interest. No matter what branch of learning we may select we will soon find that it has, directly or indirectly, some relation to man.

Methods Used by Anthropologists

The methods by which anthropologists have discovered and worked out what is known about prehistoric and living man are chiefly paleontology, archeology, ethnology, linguistics, and physical anthropology. The most important discoveries of the skeletons and handiwork of ancient man have been made in

* For an explanation of the terms race, species, and genus, see pages 43-44.

river terraces, under the floors of caves, under the mud and gravel of glaciers, in the deposits of cinders, dust, and lava from volcanoes, and in the excavations of long-lost ruined cities.

The remains found high up on the upper river terraces are of an earlier period than those found nearer the present banks of the river—for as the river deepened its channel, man moved to the newly exposed and lower terraces. In the caves the remains are covered by the débris left by later inhabitants of the caves or by droppings from the roof of the cave, or in some cases by the stalactites and stalagmites which formed as the roof of the cave was eroded by water. The later remains are higher and nearer the present floor of the cave.

The ruined cities of the East afford evidence through archeological excavations that one city was built upon the ruins of another, sometimes as many as thirty times in one place. The cities were walled and the débris of each ruin filled the place to the top of the wall before another city with a new wall was built on top of the old site. The different levels may have been occupied by people of different races and cultures.* The remains of broken pottery, of tools, of various kinds of architecture, and of different kinds of skeletons enable an archeologist to define the race and culture of each level. Sometimes a whole country with all its cities and towns was devastated and the places burned; the same kind of race and culture over a given area would mean that the people lived there at the same time. Thus the period of occupation of a country by one race at a certain time in relation to other races and other periods of time can be determined.

To some extent the same is true of the remains in river terraces and caves. According to the law of superposition the deeper the strata, the earlier and simpler the form of life. Fossils show a relationship to each other among themselves, comparable to the relationships and grading of modern animals, and this grading corresponds to the layers in which the fossils are found. Any one stratum may contain remains that no other stratum contains. So we study the remains of man, with his implements and other evidences of culture at different levels,

* Culture—"the sum of all the ideals and activities and materials which characterize a group of human beings."

together with the remains of animal and plant life, in order that we may reconstruct something of the history and manner of life of these prehistoric people.

When we consider the vast length of prehistoric time—mil-

Underwood & Underwood

Fig. 1—DR. ALEŠ HRDLIČKA

Tracing the route in Alaska of the Asiatic invasion of North America

lions upon millions of years—and, until comparatively recent times, the lack of historic records or evidences of prehistoric life and movements, we can visualize the immensity of the problems modern anthropologists have been called upon to solve, and

realize the difficulties experienced in attempting to harmonize the different points of view.

Investigation and discovery are man's life-blood. Through his researches, systematic studies, and inventions he has not only changed the face of the earth and human relations, but he has changed the thought of the world. It is a long way from the crudely formed flints and other implements of primitive life to the Machine Age of Man. Much water has passed over the dam since man's first efforts to provide food and shelter, since his first attempts at speech and writing, and his first expressions in art and music. As Anatole France has well said, "Man entered painfully on his kingdom. He was defenseless and naked." But in his evolution we see pictured the real drama of life—from its first beginnings in great weakness, darkness, lack of knowledge and physical equipment to a gradual unfolding of mind and spirit that captures our imaginations by the marvels of its triumphs.

Although great advances have been made during the last hundred years in interpreting the past, much yet remains to be done before so vast and complex a subject can be treated with the complete assurance that the final word has been said on every aspect of this great branch of knowledge.

In the following pages we shall attempt to trace some of the steps in man's ascent; show some of the methods of differentiation of man in the formation of races; point out the main routes of race dispersal; describe as briefly and as clearly as possible the characteristics of the chief races and their subdivisions, and indicate their present locations. This outline is simple, but the parts are complex, and the task is to unravel the manifold threads of racial differences and thus help to clarify the cultural, linguistic, and archeological tangle and unite all into a harmonious whole.

CHAPTER II

A BRIEF VIEW OF PREHISTORIC PEOPLES

The Influence of Ancient Peoples

In the course of time many peoples have come and gone, and even civilizations for one reason or another have disappeared. We little dreamed in 1890 what an important part Crete had played in the civilization of the Mediterranean by carrying the civilization of Egypt into Greece and even as late as 1870 the existence of the Sumerians was unknown; but through the excavations in Mesopotamia of the joint expedition of the British Museum and the University of Pennsylvania Museum, and of other expeditions, their history can now be written and their art illustrated more fully than is possible of many ancient peoples. The influences of Sumerian civilization upon our modern life have been surpassingly great. Their military conquests, the high level of their arts and crafts, their written language, their commercial organization, their development of the arch, the vault, and the dome, their social organization and high conceptions of morality, their history of the Creation, the Flood, their laws (the pentateuch of Moses), and their ideals of justice have influenced Christianity perhaps more than has Judaism.

Urartu, an independent kingdom north of Assyria in the time of Tiglathpilezer, about 700 B.C., fought with the Kings of Assur as only great kingdoms can fight, yet had not the princes carved inscriptions on the rocks of Van the history would have been quite unknown. We scarcely remembered Elam * before the excavations in Persia. Even yet we know nothing of the powerful rulers who constructed what are now the ruins of Yucatan (Mexico). These examples give us pause when we attempt to reconstruct the past.

* An ancient empire, east of the lower Tigris, south of Media, and north of the Persian Gulf.

We talk of the epoch of the dolmens as though the sepulchral monuments—dolmens, menhirs, and cromlechs—had been constructed at the same time and by the same people in many parts

Courtesy of the American Museum of Natural History

Fig. 2—THE RUINS OF THE NUNNERY IN THE ANCIENT MAYAN CITY OF UXMAL IN YUCATAN

of the world. The fact is the dawn of history started only with the development of writing. Chaldea, Elam, and Egypt early realized the value of permanent records, but many peoples unfortunately have left no annals. Then came the civilizations of Crete, Phoenicia, Assyria, the Hittites, and Cyprus, and finally the Greeks and Latins appeared on the scene. The Barbarians registered their history later, although earlier it was blazed in archeology through their tools, their pottery, and their swords. The history of Gaul began with Caesar and the history of Scandinavia with the Carlovingians, but the unassimilated peoples of the New World, of the Pacific, and of central Africa are without history.

The Spread of the Peoples Through Europe

In Europe and Asia the Glacial period, beginning about 300,000 years ago, followed in the course of time the upthrusts of the terrestrial crust which formed the Pyrenees, Alps, Cau-

casus, and Himalayas, the greatest mountain ranges in the world in elevation and grandeur. This upthrust may have led to the

Courtesy of the Cunard Line

Fig. 3—THE DOLMEN OF PROLEIK, NEAR DUNDALK, IRELAND

great snow fields of the North. The line of mountain cleavage divided man in Europe into two groups that have developed in two divergent lines, the result chiefly of climatic differences. Central Europe was warmer in mid-glacial times than at present and north Africa was warm and moist instead of hot and dry as it is now. These differences are reflected in man's life, his tools, and his customs, as we shall see.

We know that man of the Neanderthal * form existed all over Europe during the latter third of the Ice Age, and spread away as the ice receded to become altered into other forms, such as the aboriginal Australian, American Indian, and early Aurignacian; later into the Hamitic, the Semitic, the Alpine, the Mediterranean, and the Nordic races, and the multitudinous groups of modern peoples all over the world. We shall learn about all these races in a later chapter.

The first traces of human intelligence, as shown in the Paleolithic flint implements, followed the setting in of the Ice Age, and as further climatic changes ensued, we pass successively from the rough stone of the Pre-Chellean period through the

* For explanation of the Neanderthal and other ancient forms mentioned in this chapter see the Glossary.

Chellean and Acheulian periods to the much more advanced of the Mousterian period, and then through the progressing Aurig-

Courtesy of the American Museum of Natural History

Fig. 4—FLINT IMPLEMENTS TYPICAL OF EARLY PALEOLITHIC AGE

1, hand-ax or chopping tool of Chellean period; 2, dagger or perforating tool of Acheulian period; 3, scraper of Mousterian period

nacian, Solutrean, and Magdelenian periods, with the gradual development of animal art.

The snow and ice of the Alps, the Caucasus, the Persian and Iranian plateaus, and the Aralo-Caspian Lake extended to the polar ice, and man developed in small groups in isolated places. When these gates of ice opened, man spread and developed cultures, beginning with agriculture; first in all the section south of the mountain divide, and later to the north. The northerly route through marshes, and later steppes, in Siberia and Russia, was more difficult than the southerly, and many centuries, or perhaps thousands of years, separated the advent of man's return to Europe through the northerly route from his return through the southerly route.

Early Industries and Civilization

The Mesolithic industries include the Azilian, Tardenoisian, Maglemosian, and Campignian epochs. The period showed some knowledge of pottery. Grains had already begun to be cultivated in the East, and cooking in pots now took the place

Courtesy of the American Museum of Natural History

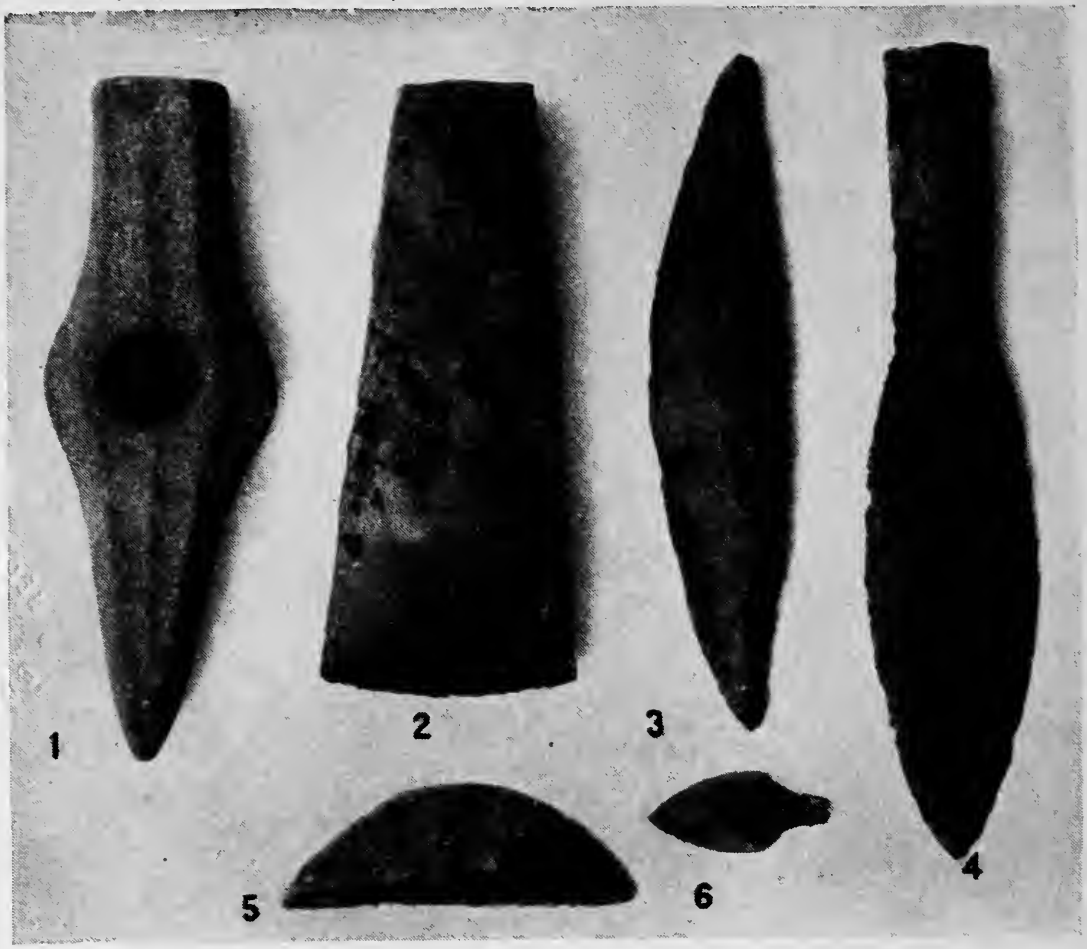


Fig. 5—IMPLEMENTS TYPICAL OF NEOLITHIC AGE

1, ax-hammer of stone, perforated for hafting; 2, ax of flint, partly polished; 3, saw of flint with one edge notched; 4, dagger of flint; 5, knife, or sickle blade; 6, arrowpoint

of cooking on open hearths. Wave after wave of peoples poured over Europe for thousands of years, first from the south and later from north of the mountain barrier. Some of these movements coming later, in the Neolithic age (about 5000 B.C.), brought into Europe the knowledge of polished stone, cattle raising, many forms of agriculture, and also weaving.

In the course of the Neolithic industry, copper, the precursor of bronze, was discovered; this was at least three millenniums before the Christian era. Copper was discovered in the northern mountains of western Asia, where it was plentiful. Soon after this came the development and use of the bronze sword, later followed by the iron sword, which figured in the wars waged by the conquering Horsemen of the Steppes of 2500 to 500 B.C. over the greater part of Europe and southern Asia. Iron appeared about 1000 B.C.

Neolithic men, probably not later than 4000 B.C., coming from western and central Europe, were the first settlers in Scandinavia and Finland, although the Epi-Paleolithic men, like the Aurignacian, the Cro-Magnon, and the more recent Nordic Race were there before; and here, later than in southern Europe, we find evidences of the culture of the Neolithic peoples in their work of polished stone, copper, bronze, and iron.

The first of modern peoples to appear in central Europe were the Alpine Race, who occupied the whole of central and eastern Europe before the advent of the Horsemen of the Steppes, who cut through them, conquered or dispersed them, or settled down, lived with them, and intermarried.

In the meantime civilization had started in Elam and was carried on by the Semitic and Mediterranean races in Chaldea and about 2900 B.C. by the first Pharaohs in Egypt, contemporaneously with the civilization of Mesopotamia and Asia Minor. This civilization was carried by the Hamitic and Mediterranean races from Egypt to the island of Crete; in Greece it met the culture of the Alpine and other races from the north. The first of the Mediterranean migrants into Greece were the Pelasgians, who settled in Greece and Asia Minor. Then followed the Aegeans after the Minoan * culture had been established thoroughly in Crete. Later there appeared from the north, from Thrace and the Danube, the Mycenean † culture of the Alpine Race; this race, also known as Thraco-Phrygians, was closely related to the inhabitants of ancient Greece.

At this time the Hellenic peninsula and its islands were, it would appear, but sparsely settled. Later the coast of north Africa is found to be inhabited by a native population of the Hamitic Race, who had developed a phase of the Paleolithic culture, called Capsian, which was more suited to their needs.

Differences Existed Among Ancient Peoples

As the years went on each people in Europe shared in the general progress but there were wide divergences in aptitudes and tastes, and all were not equally apt at learning or in assimilating higher ideas. The Horsemen of the Steppes, who came

* A prehistoric culture of Crete prior to the Mycenian culture.
† A forerunner of Hellenic or Greek culture.

later than the Mediterraneans, were cruder in culture than the latter, though possessing greater fighting ability and organization. We know they did not lack in aptitude and individual genius, for from their stock mixed with that of the Alpines and of the Mediterraneans were to spring the Hellenes and the Latins, whose ancestral ideas were complemented by what they learned from African cultures. Eventually the latter surpassed their teachers from north, south, and east in every branch of human knowledge.

In the land of their origin some were more advanced than others. Even in historic times such differences persisted. The "Barbarians of the North" possessed more advanced ideas than the Roman in some respects, but were behind in others. Thus it was that the Greco-Latin culture, which dominated the world for a long period, was not comprehended in every land to the same degree, and many peoples still retained their barbarian instincts although they had the veneer of culture and its intellectual activities.

The Ligurians of northern Italy, through their tradesmen, spread the smooth stone and bronze cultures over northern Europe, from the Russian plains to the Atlantic, and peopled part of Gaul. Then came the peoples of the Hallstatt culture of painted pottery, weaving, and metal working, especially the

Courtesy of the British Museum

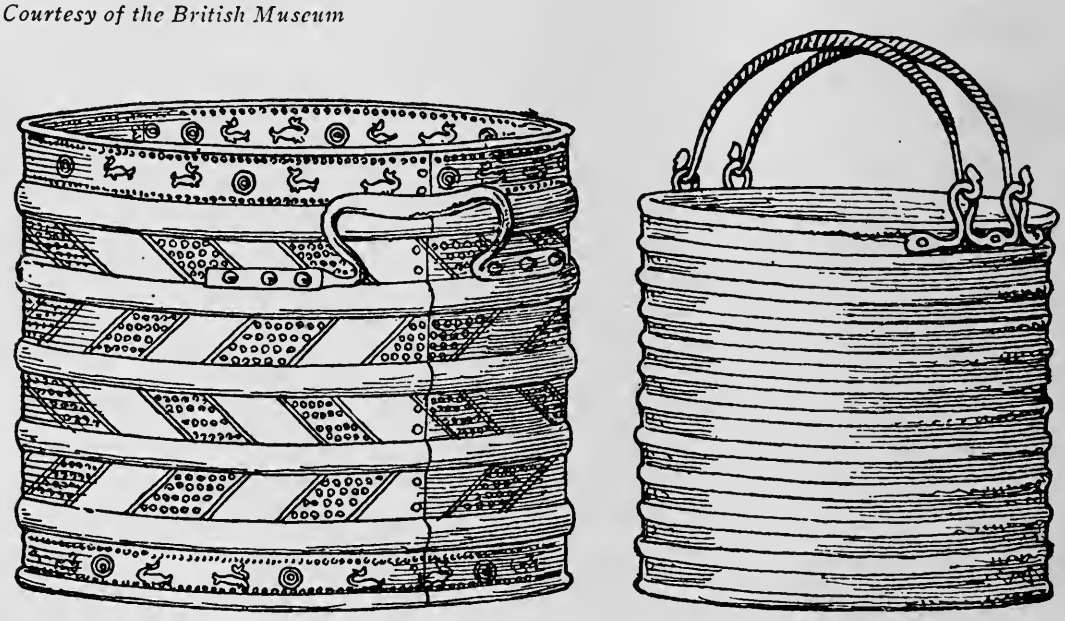


Fig. 6—IRON BUCKETS FROM THE HALLSTATT PERIOD
The one on the left is ⅕ actual size, and the one on the right is ¼ actual size

iron industry, through the Danube country. Ligurians and the Horsemen of the Steppes brought specialized industries and artistic tastes. The first built their art on geometric figures, the second on men and animals, but used the geometric designs. The Ligurians and the Horsemen, as we shall see later, were probably derived from the same stock in the same area, as they were forerunners of vast hordes of similar Aryans who followed them for centuries, if not thousands of years. They had nothing in common with the civilizations of the East, except their high original spiritual and personal ideals, nor with the Mediterranean civilization. The industry succeeding the Hallstatt, with its iron swords, and its horses and chariots, known as "La Téne," shows abundant evidence of mixture with Mycenaean, Greek, and Etruscan * influences.

In Irania the Aryans imposed their speech and culture on other peoples, but kept their racial characters distinct. Thus we read of such noble rulers as Darius, Cyrus, and some of the other Achaemenides; of such great heroes as Rustum; of poets, mystics, and philosophers, such as Hafiz, Saadi, and Omar Khayyam—each of whom can hold his own with modern rivals. So also from the Indo-Aryans we inherit a rich legacy of a copious and varied literature—the Veda, the sacred literature of Hinduism; the Ramayana and the Mahabharata, the two great epics of India; and endless theosophic writings. The ancient Aryan of the East and West possessed some of the highest ideals; and from that time to the present the impress of their ideas upon the thought of the West in Europe, Britain, and America, and upon the East in India, China, and Japan, is clearly discernible.

* From Etruria, which comprised the region of Italy between the rivers Arno and Tiber inland to the Apennines.

CHAPTER III

THE NATURAL HISTORY OF MAN

The Ascent of Man

TO UNDERSTAND the natural history of man and his ascent it may be well to consider briefly something of the geologic and climatic conditions preceding his ascent, and some of the forms of life which existed on the earth before his advent.

The tertiary epoch, essentially the age of the development of mammals and the higher plants, is divided into four periods, each several millions of years in duration, namely, the Eocene, the Oligocene, the Miocene, and the Pliocene. The oldest of these,

© *by the Field Museum*

Fig. 7—A SEA BEACH 500,000,000 YEARS AGO

All the known life at that time was marine; the largest known animal was a straight-shelled mollusk, *Orthoceras,* whose shells sometimes reached a length of fifteen feet

From the painting by Charles R. Knight which was presented to the Field Museum by Ernest R. Graham

© by the Field Museum

Fig. 8—A FOREST 350,000,000 YEARS AGO

During Devonian times, the expanding plant life first attained the size of trees. These included the now extinct group of seed ferns and the giant ancestor of modern club mosses and of modern scouring rushes. Interspersed with these trees grew other comparatively small plants which may be considered as transitional between sea weeds and true land plants

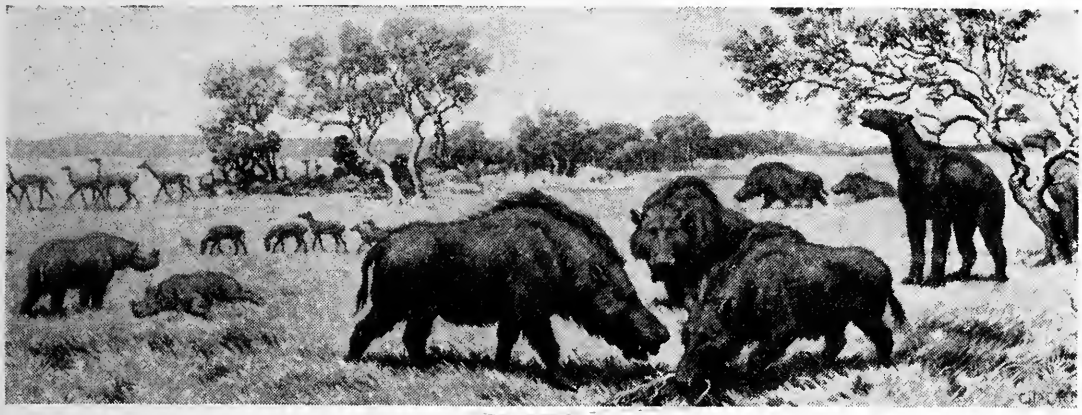


Fig. 9—MAMMALS OF 20,000,000 YEARS AGO

Those restored here, from left to right, are a slender llama-like camel, a two-horned rhinoceros, a three-toed horse, a giant pig, and a claw-footed animal. Remains of all the animals have been found in Nebraska

Fig. 10—MAMMALS OF 15,000,000 YEARS AGO

At the left is a group of short-legged rhinoceroses; in the center are two four-tusked mastodons; at the right is a ruminating hog

Figures 8, 9, and 10 are from the paintings by Charles R. Knight which were presented to the Field Museum by Ernest R. Graham

the Eocene, or "Dawn," period, saw a beginning of the Primates —the Tarsioids, small catlike animals approaching the lemurs and small monkeys. In the Oligocene and Miocene periods came true lemurs, monkeys, and eventually some primitive anthropoid apes, such as the *Dryopithecus* of Europe and India. The Pliocene is the period of differentiation in the apes— *Pliopithecus* is almost a full-fledged gibbon—and also in this period developed the superior forms which were the precursors of man. After this period came the Quaternary epoch, or Ice Age, characterized by one or more cold periods when ice was spread over a large part of the earth in the northern hemisphere, with warm periods occurring in between. At this time appeared something entirely new, chipped flints, which show the handiwork of some form at least approaching that of man. As time went on these flints increased in variety and bear evidence of skill in their development. In all this there is an orderly sequence that must be given weight in our studies of man's origin.

Man began to develop his present form in the Pleistocene period. During the Eocene period Asia and Europe had a warm and equable climate and anthropoids lived far toward the north of these two continents. Some of them were of large size, indicating that conditions were favorable and food abundant. The Oligocene period was cooler, and the Miocene was colder and drier. Palms disappeared from northern Europe, food was scarcer and life became more difficult. When the fruit and nut trees had been crowded out and famine threatened, the anthropoids moved farther south for food and comfort. Doubtless there was still much food on the ground in the form of small fruits and berries, roots and tubers, but as the anthropoids were obliged to live most of the time in the trees existence indeed became uncertain.

During the latter part of the Quaternary epoch a dry and harsh climate fitted vast plains for grazing animals and provided great forests for game. This was an age of great abundance of food for mammals, but the slow and extended progress of increasing cold culminated in the Ice Age, destructive to much animal life in the northern hemisphere. The aridity was even worse than the cold. At this time the great inland sea basin, from the Mediterranean to the Indian Ocean, began to rise, the

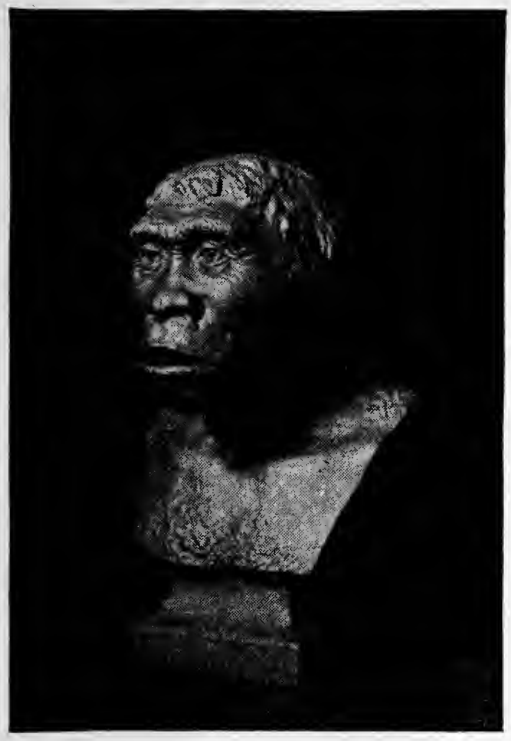


Fig. 11—THE JAVA MAN
Pithecanthropus erectus

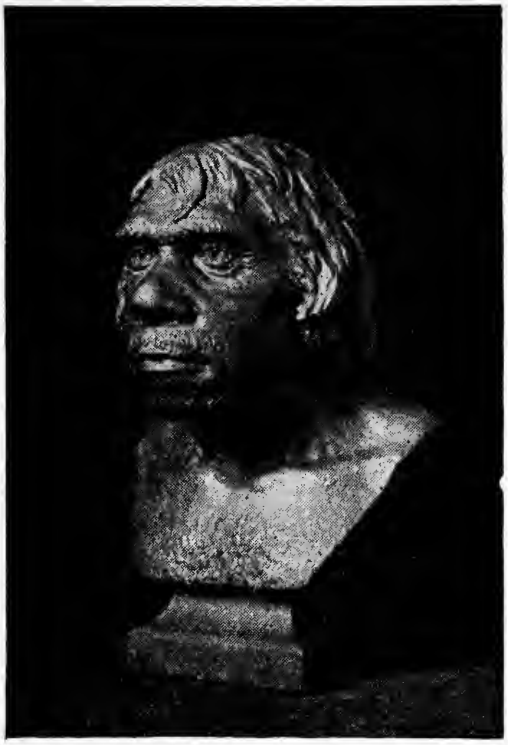


Fig. 12—THE NEANDERTHAL MAN
Homo neanderthalensis

These restorations in the American Museum of Natural History were made by Dr. James Howard McGregor and are modeled on restored skulls

first uplift taking place along the Pyrenees and the Alps. The old inland sea was displaced, and the greatest mountains of the world, the Alps and the Himalayas, grew by repeated upthrusts. Forests disappeared, and vast hordes of forest-dwelling animal forms were exterminated. Animals of the plains flourished and there was a great increase of horses, rhinos, and cloven-footed ruminants. The mountains shut out the moisture, lessened by the reduction of the seas, and aridity increased over large regions.

The anthropoids spread over India and into Africa. Some of the hardier members who had remained in the cold, dry areas, began to descend from the trees, seeking the food upon the ground. This was a dangerous experiment. Only the most active, wary, and quick-witted survived. Some of these, not baffled by the hazard of their new life, became superior to their fellows, developing a fair-sized brain, together with a more discriminate use of their hands and feet. Manlike forms, such as the Java man (*Pithecanthropus erectus*) in Asia and the Neanderthal man (*Homo neanderthalensis*) in Europe and later forms, developed at this time.

Man Is a Primate

Man is included with the Primates, so called because they are the premiers of mammalia. However, man, in the sense that he is not so far along in his own evolution, is actually more primitive than the lower forms. This is because of the lack of that differentiation and specialization which distinguish the camel and the horse or the lemurs, the monkeys, and the apes.

Primitiveness *versus* Specialization

Animals, with the exception of man, have missed premiership because of their specialization. A rapid specialization means a loss of adaptability. Hoofed animals eliminated tree life, thus all possibility of the development of skill in manipulations was lost to them. The brains of carnivora, or flesh-eating mammals, are much more specialized and complex than are those of some primate brains, but they are specialized in such a way that the association of ideas and the ability to think have been lost to them. The hand of man is a much more highly organized mechanism than his foot, yet the foot is a more specialized but less primitive organ than the hand. Any thoughtful student will appreciate the difference between primitiveness and specialization.

The Shrews are divided into land and tree varieties. The land variety possesses a brain made up largely of the olfactory or smelling mechanism; the tree variety, on the other hand, possesses a brain made up of a relatively large visual mechanism. The latter was the first step in the evolution of the Primates, and was an advance in the right direction. In the Tarsioids there was a notable advance in the same direction; the olfactory brain was eclipsed and vision was paramount. Then came the monkeys who had shorter snouts, and instead of claws, five fingers (with nails) on each hand and whose forward-looking eyes developed a binocular (stereoscopic) vision.

The tree shrews and lemurs had such skill in balancing the body and judging distances in leaping and swinging from tree to tree or from limb to limb that those portions of the brain controlling the equilibrium of the body—the cerebellum and semi-circular canals correlated with the binocular visual mechanism, the cerebrum—developed in these animals to a large extent.

Courtesy of the American Museum of Natural History

Fig. 13—THE HAND OF AN ADULT BANTU NEGRO AND THE HAND OF A GORILLA

From a photograph taken by the Columbia University —American Museum Expedition of 1929–1931

This same development occurred in man by reason of his erect posture and has resulted in a relatively large cerebellum and visual mechanism. Sitting upright, as do the apes, developed more delicate manipulation in the freedom of the arms, and this led to a close association of the movements of the arms and hands with binocular vision, and resulted in the development of brachiating * movements. By turning the backbone on end the apes set themselves on their feet and raised their faces toward the sky, and thus encouraged the hand and brain to work out life on a higher plane.

The monkeys were the first to execute wonderful feats in balancing and ballistics, but the performances of the gibbons are so dazzling that those of the monkeys pale in comparison.

The later apes left the forest and wandered far over plain and plateau, with increasingly upright posture and heavy lumbering bodies, appearing somewhat similar to the gorilla and to the Neanderthal man.

The monkeys and apes are more specialized than man, but all these forms are mere offshoots from the parent stem which have specialized more or less, each in his own direction.

Tracing True Man's Ascent

Out of the depths of past ages man has evolved—nobody knows from where and nobody knows from what. Forms have been found in Asia and in Africa which are supposed to have been

* Brachiating, swinging by the arms from tree branch to tree branch.

Courtesy of the American Museum of Natural History

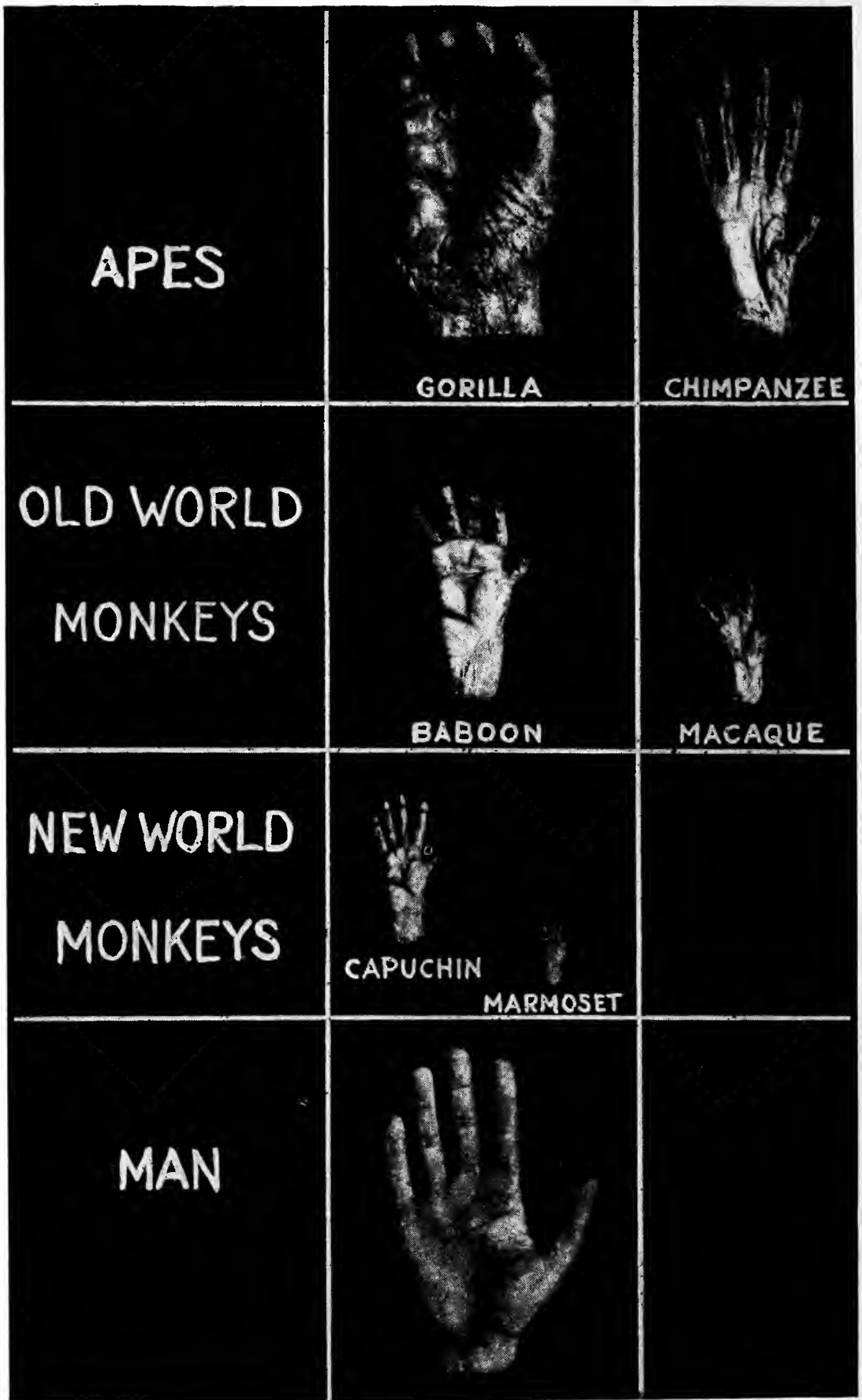
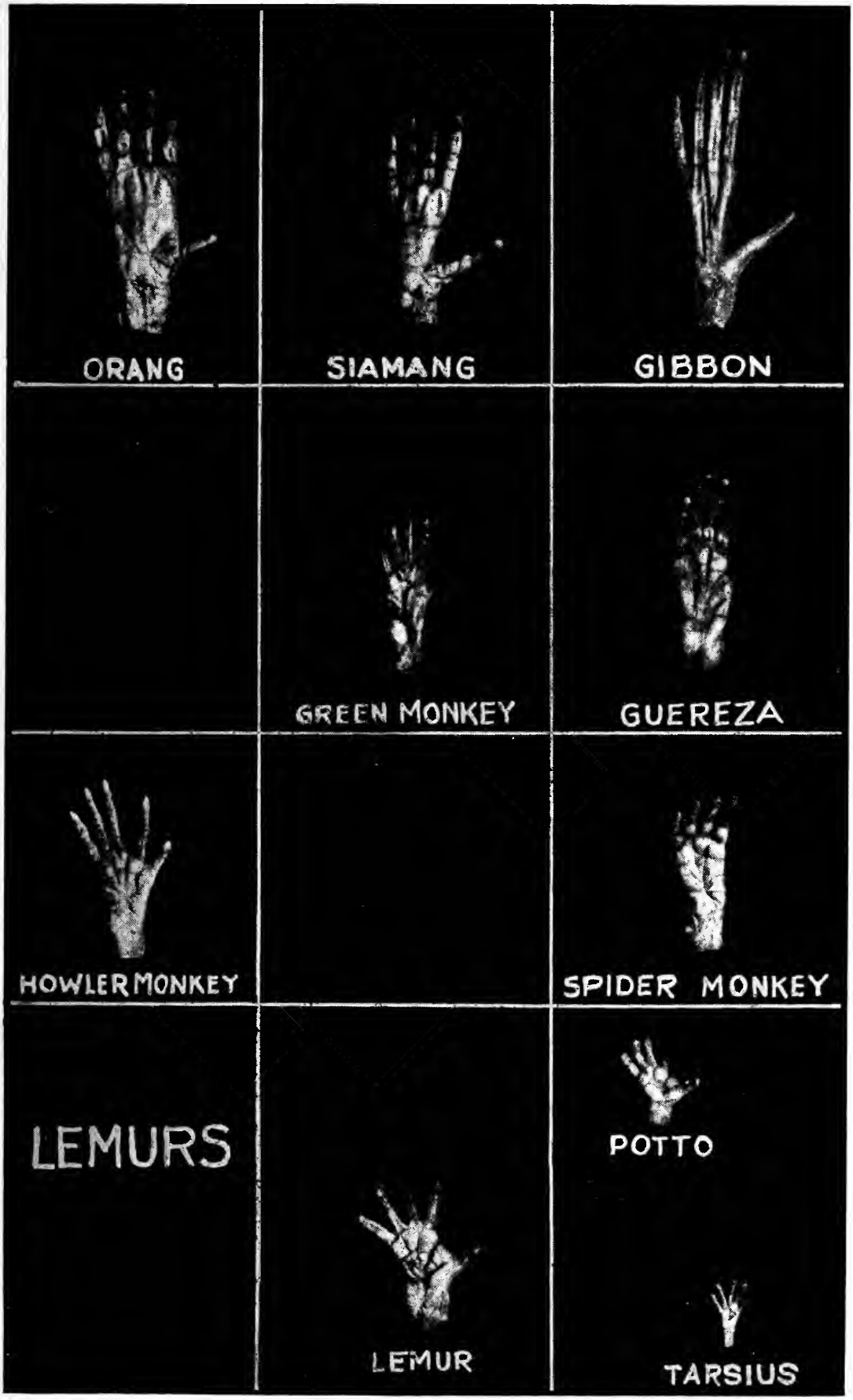


Fig. 14—PARALLELISM


ORANG
SIAMANG
GIBBON
GREEN MONKEY
GUEREZA
HOWLER MONKEY
SPIDER MONKEY
LEMURS
POTTO
LEMUR
TARSIUS

Courtesy of the N. Y. Zoological Society

Fig. 15—A GIBBON

The gibbons are considered the lowest of the anthropoid apes

From a photograph by Elwin R. Sanborn

human precursors, but not until we reach the Neanderthal phase of physical man are we on firm ground, and from that time to the present, man as a distinct species may be traced in Europe through his evolution in almost unbroken lines. Although the Neanderthal man was subject to even harder conditions in Europe than those which had existed in Asia or in Africa, we find, not later than 28,000 B.C., some of these peoples spread over many of the more habitable parts of Europe. The ice at this time had gone farther north than St. Johnsbury, Vermont, in America, Pomerania in northern Europe, and Zurich in the Alps.

Neanderthal Man

Parts of more than a hundred skeletons of the Neanderthal form, or closely related thereto, have been found in Europe and Asia from Gibraltar to Moravia, and from the Neander Valley to Galilee, Crimea, and far-off Peking (*Sinanthropus pekinensis*). They have come from river drift, rock shelters, old caves, ancient gravels or sands, and even from hard stones, and they have been picked up with the bones of ancient, long extinct mammals, such as woolly rhinoceroses, woolly mammoths, cave bears, lions, hyenas, horses, oxen, and elks.

The earlier forms of man chipped flints of quartz or other

stone by percussion, later by pressure. Along with this industry there were hunting and trapping and probably fishing. Food

Courtesy of the N. Y. Zoological Society

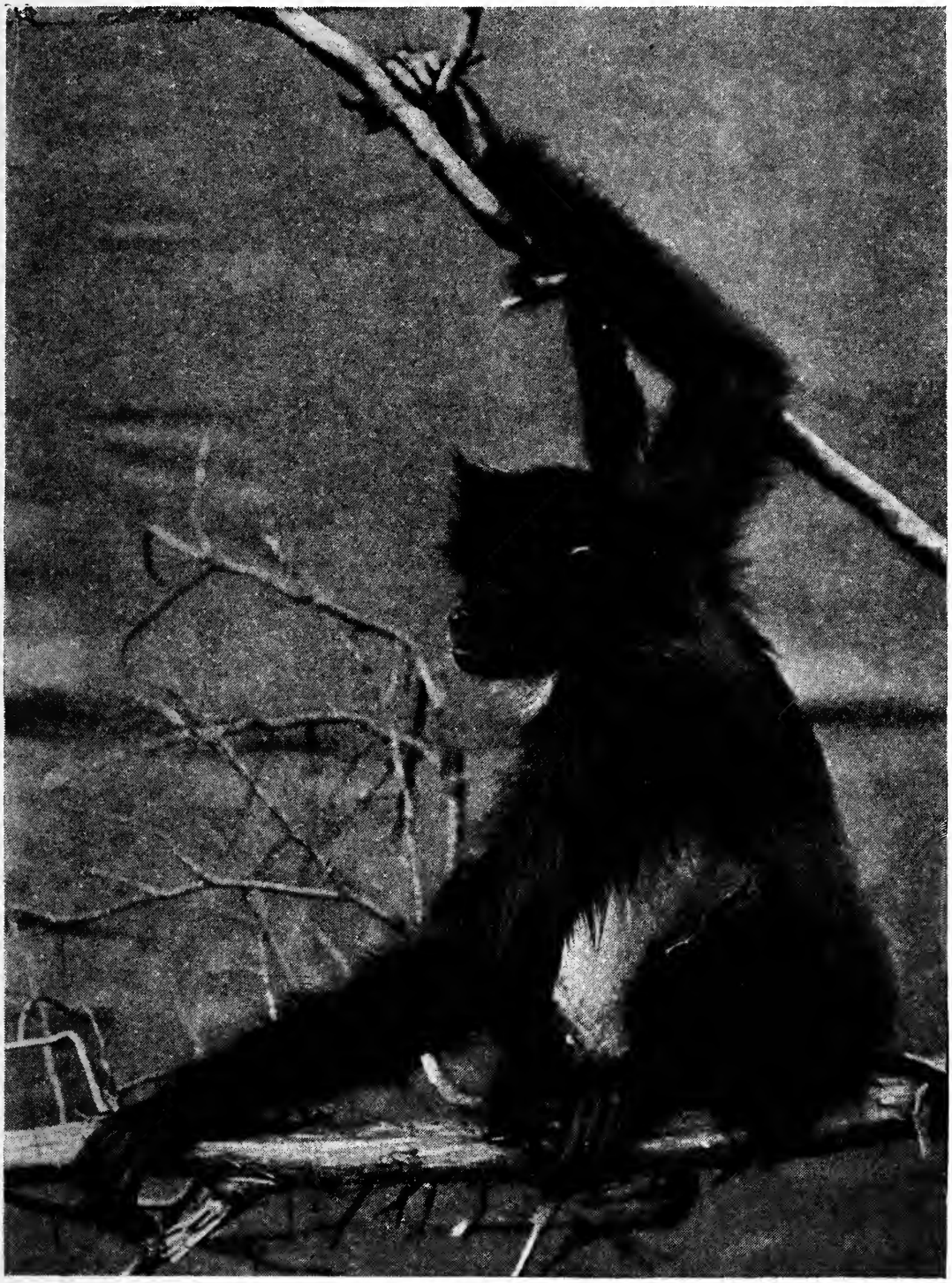


Fig. 16—A BLACK SPIDER MONKEY

Spider monkeys are the most slender of American monkeys, are strictly arboreal, have excessively elongated hands, and are thumbless

From a photograph by Elwin R. Sanborn

Courtesy of the N. Y. Zoological Society

Fig. 17—A GORILLA
From a photograph by Elwin R. Sanborn

was prepared by roasting over the coals. There was no agriculture and no evidence of the domestication of animals. Neanderthal man was burly, often of great strength, about five feet three inches in average male height, compactly built, with long arms, and probably did not walk in a perfectly erect position.* He had beetling brows which show on the skeleton as a heavy roll of thick bone running across the base of the forehead just above the eyes. He had a large prominent aquiline nose, and jaws with larger teeth than any modern man. His feet were not perfectly adapted for terrestrial locomotion, nor his hands for multiple movements, because his thumb had not yet become separated from the forefinger so much as in modern man. He was a worthy foe of his animal contemporaries, whom he met in the open in vicious combat, or trapped in huge pits where they were killed later with spears, clubs, or great stones. Whatever forms may have preceded the Neanderthal, their culture

* For additional information concerning the physical structure and activities of the Neanderthal and other races and peoples see Chapter IV.

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Fig. 18—THE CAVE BEAR

The cave bear lived in Europe during the Ice Age; its fossil bones are found in caves along with those of primitive man. It is the largest bear known to science

From the painting by Charles R. Knight which was presented to the Field Museum by Ernest R. Graham

was continuous with the latter, and the forms of man that followed the Neanderthal continued his culture in part at least, but of course with alterations as time went on.

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Fig. 19—WOOLLY MAMMOTHS AND WOOLLY RHINOCEROSES

The woolly mammoth lived in the frozen regions of North America, Europe, and Asia. The woolly rhinoceros has been found in Europe only

From the painting by Charles R. Knight which was presented to the Field Museum by Ernest R. Graham

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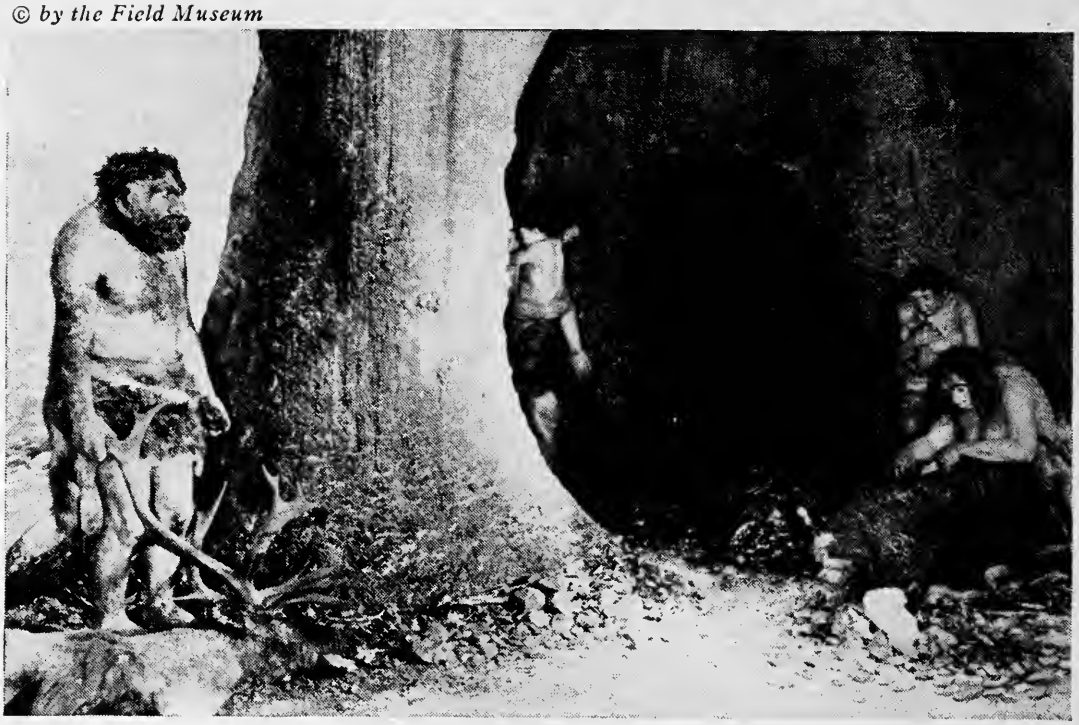

Fig. 20—A NEANDERTHAL FAMILY

From a life-size group in the Field Museum; it is the work of Frederick Blaschke

The Rhodesian skull, found in the Broken Hill Mine, northern Rhodesia, South Africa, June 17, 1921, is in some respects an exaggerated form of the Neanderthal, and indicates that such Neanderthaloid forms lived in Africa, perhaps until fairly late.

© by the American Museum of Natural History

FIG. 21—THE NEANDERTHAL FLINT WORKERS OF THE RIVER VÉZÈRE

In the immediate background is the famous cavern of Le Moustier, which gives its name to the culture of the Neanderthals (Mousterian)

Drawn under the direction of Henry Fairfield Osborn by Charles R. Knight for the Hall of the Age of Man in the American Museum of Natural History; reproduced by special permission

The aboriginal Australian, as evidenced by the Talgai skull found in Queensland, Australia, with the bones of a primitive dog and giant extinct kangaroo, was more or less of Neanderthaloid form. However, the living Australian of the pure type, unmixed with the Papuan and derived from the aboriginal form, is, except in color, close to the white man with modernized Neanderthal physical characteristics. The body is often extensively covered with hair, and the features of the face are distinctly those of the White Race, although of a primitive form. The Pre-Dravidians of India and the Wadjak men of Java were of the same stock as the aboriginal Australian who came to that part of the world from the direction of Asia Minor.

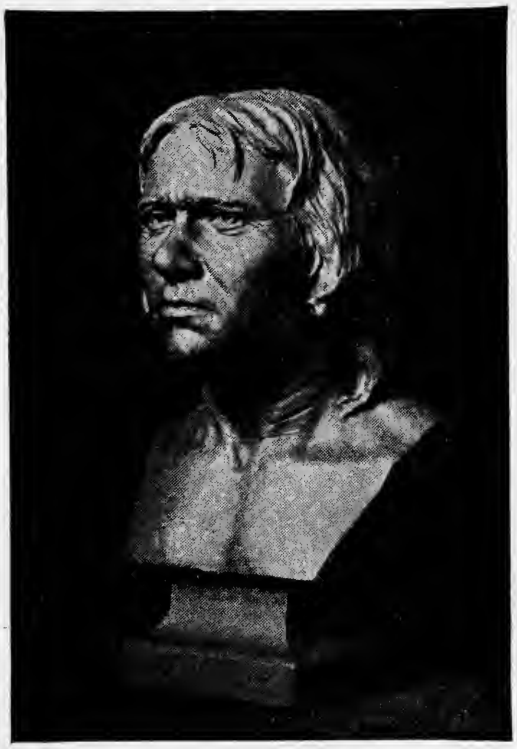

Fig. 22—CRO-MAGNON MAN

Homo sapiens

This restoration in the American Museum of Natural History was made by Dr. James Howard McGregor and is modeled on a restored skull

One of the skulls found in a cave on a steep, wooded mountainside, in the district of Spy, province of Namur, Belgium, in August, 1879, skulls found at Krapina, a rock shelter near Zagreb, in northern Croatia, and others discovered in Moravia and elsewhere, show modification from the Neanderthal toward modern man. The Aurignacian man in Europe, who followed the Neanderthal and was evidently of a transitional form, gradually changed into the Grimaldi, Brno (or Brünn, or Combe-Capelle), and the Cro-Magnon, all of which are similar and resemble the Littoral type of Deniker and the Nordic Race.

The Cro-Magnon had a high culture in chipped stone, bone, and other hard materials, and a highly realistic animal art. Aurignacian man lived from about 25,000 to 15,000 years ago when the glaciers had receded to an area between St. Johnsbury, Vermont, and Ottawa, Ontario, Canada, Pomerania and Eslav (Scania) in northern Europe, and Zurich and the Bühl period

in the Alps. The Cro-Magnon lived not later than 9000 B.C., following the Würm period in the Alps, when the ice had receded beyond Cochrane in Ontario, Canada, and the Fenno-Scandinavian moraines in northern Europe.

Causes for Man's Spread Over the Earth

As the climate gradually changed from the glacial cold toward modern heat, man spread far and wide, and the animal life that was hunted changed from the ponderous mammoth and rhinoceros to horses, oxen, and elks, and as time went on these were replaced with deer and other modern forms. These smaller and more active quarries necessitated greater activity in the chase, and the heavy, lumbering form of the Neanderthal changed toward that of modern man and gained in grace and agility.

The great forests of the Asiatic plateaus, and especially the Iranian plateau in its broadest sense, attracted man. The Iranian plateau stretches from India into Persia, for a distance of about 1000 miles, and during the moist glacial epoch was a region rich, well watered, and park-like in its flora, filled with forests of fruits and nuts of many kinds. Its climate was semitropical and it was the original home of the apricot, fig, peach, and orange whence they were taken to Italy by the Romans. Here the grape grew luxuriously and the wild olive was domesticated, improved, and transformed. Oaks, walnuts, chestnuts, and a great variety of smaller trees furnished abundance of nuts. The forests teemed with game, the open glades favored agriculture, and grain may have originated here.

The Asiatic plateaus became higher and drier and the aridity caused the denudation of the forests on their summits, and the inhabitants therefore moved away in all directions. The earliest known group to move from the bulk of humanity followed the lines of least resistance through India and eventually became the aborigines of Australia. The domestication of animals had already started, at least the domestication of the dog, and the Australian carried his dog with him as he followed the game through the forests away from the arid plateaus.

Many other peoples moved from the plateaus to other parts of Asia; later others moved into Africa, and still later others

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Fig. 23—CRO-MAGNON ARTISTS PAINTING THE WOOLLY MAMMOTH
In the cave of Font-de-Gaume, Dordogne, France
Drawn under the direction of Henry Fairfield Osborn by Charles R. Knight for the Hall of the Age of Man in the American Museum of Natural History; reproduced by special permission

into Europe. The great masses of developing agriculturists settled in the fertile valleys of Asia, Africa, and Europe. Thus the valleys of the Yang Tse Kiang and the Hoang Ho of China, the Brahmapootra, the Indus, and the Ganges of India, the Tigris and the Euphrates of Asia Minor, the Nile and the Great Lakes of Africa, the lakes of Italy and Switzerland, the Danube and the Rhine, the Rhone, the Garonne, the Seine, and the Somme of Europe, became the homes of settled communities.

Climatic Influences

During the Magdalenian period, following the Aurignacian, the climate in Europe was subarctic, and this continued decreasingly into the Azilian period when the Baltic was an ice lake. About 5000 B.C. the climate in Europe became distinctly warm and dry, the oak and kindred trees succeeded the hazel, birch, and pine. When the Bronze Age appeared the climate was warm and moist, subsequently becoming cooler during the Iron Age and the historic period.

The extremes of the Ice Age may have been a great factor in the evolution of man through stresses and strains, physical and mental; the dry, warm period following the Ice Age may have been the basis for the flowering of an early civilization, which the cooler modern period is carrying on to greater progress.

Courtesy of the American Museum of Natural History

Fig. 24—THE FAMILY TREE OF MAN

As inferred by William King Gregory

1. Primitive Primate (*Notharctus osborni*). Fossil skull and jaw, slightly restored, of Eocene age, Wyoming, U.S.A. Original in the American Museum of Natural History, New York.
2. Prototypal anthropoid. Reconstruction, based on fossil jaw (*Propliopithecus haeckeli*) of Oligocene age, Egypt. Original jaw in Stüttgart Museum, Germany.
3. Primitive anthropoid. Reconstruction, based on fossil jaws (*Dryopithecus frickae,* etc.) of Miocene age. Original jaws in the American Museum of Natural History, New York.
4. Trinil Man. Reconstruction, based on fossil skull-top (*Pithecanthropus erectus*) of Upper Pliocene or Lower Pleistocene age, Java. Original in Teyler Museum, Haarlem, Holland.
5. Piltdown Man. Reconstruction, based on fossil skull and lower jaw (*Eoanthropus dawsoni*) of Pleistocene age, England. Original in British Museum (Natural History), London.
6. Heidelberg Man. Reconstruction, based on fossil jaw (*Homo heidelbergensis*) of Lower Pleistocene age, Germany. Original in University of Heidelberg, Germany.
7. Neanderthal Man. Fossil skull and jaw (*Homo neanderthalensis*), slightly restored, of the Old Stone age, Europe. Originals in Paris Museum of Natural History.
8. Cro-Magnon Man. Fossil skull and jaw, slightly restored, of late Paleolithic age, France. Originals in Paris Museum.
9. Australian black-fellow. One of the most primitive of existing human races.
10. Hottentot. Representing the Negro group of races.
11. Chinese. Representing the Mongolian group.
12. American. Representing the Caucasian group.

A. Gorilla, Africa.

B. Chimpanzee, Africa.

C. Orang-utan, Borneo.

D. Gibbon, India.

Summary of the Chapter

We have shown in this chapter that man rose from the Neanderthal stage in Europe and afterward spread over the world, probably ranging over the Iranian plateau in a later period, from whence, as the location became higher and drier, he probably spread away from the plateau, and as he settled in the valleys and fertile regions, developed agriculture and other cultures of civilization. Some agriculture, with the domestication of the dog and other animals, may have started on the Iranian plateau, but the Australian left that region with only the dog as his domestic animal. The earliest civilization of the world was perfected under the influence of the Mediterranean Race and was spread over Mesopotamia, Egypt, Crete, and Greece by the Semitic, Hamitic, and Mediterranean races.

Man's ascent is traced through the earlier forms, as the temperature changed in Asia and Europe from a warm, tropical climate to the Ice Age, then to a warmer period and finally to the slightly cooler one of the present time. The effect of the bitter cold and subsequent warmth is important in connection with the development of man and his civilization.

CHAPTER IV

THE EVOLUTION OF SPECIAL ATTRIBUTES IN MAN

Brain Development and Its Significance

Of all the attributes of man the evolution of the brain is the most marvelous. The differences in the brain are noteworthy in relation to individual characteristics and the sequence of forms in evolution. A few words as to the anatomy of the brain and its functions will help to make clear the differences in men and the differences between man and lower forms.

The brain in man is chiefly the cerebrum which has two hemispheres, right and left, and almost fills the cranium. The frontal lobes of the brain are behind the forehead and the occipital lobes are at the back of the head. The temporal lobes are on the sides and extend forward in the regions of the temples.

The parietal lobes are at the middle of the top of the head and receive all touch sensations and send out all motions to the body; the hind part of the occipital lobe is the area where sight is received; the upper part of the temporal lobes is the area of hearing; the eye and speech movements are controlled in the lower part of the frontal lobes. The remainder of the brain is filled with the silent areas that function in the association of the senses and ideas.

Development of Association Areas

There are two great association areas. One is in that part of the brain where the parietal, occipital, and temporal lobes join; it links touch, vision, and hearing preliminary to any voluntary response in either speech or action. The other association area is in the upper part of the frontal lobe behind the forehead; its functions are somewhat obscure but pertain to

temperament, mentality, emotions, the higher psychic functions, the esthetic, reasoning, will power, and self-control—it controls behavior and conduct.

The two great association areas in man are larger and the convolutions more elaborate than in the higher apes, and are most elaborate in the White Race. In lower forms of life the olfactory apparatus of the brain is the largest and most complex, but in man it has been suppressed and almost obliterated, so that its parts are difficult to find and can only be revealed by a specialist. As the stages of rising forms proceed in evolution, the areas for sight, sound, and general sense increase in size, until in the lower primates, as in the lemur, the brain, although simple and smooth, has a relatively small although extensive olfactory apparatus.

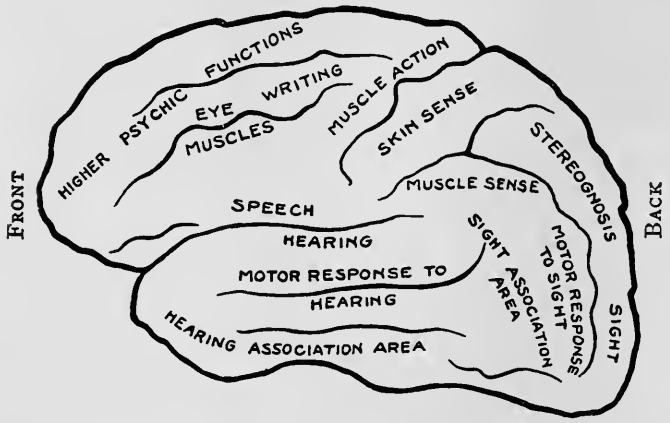

Fig. 25—LEFT SIDE OF BRAIN WITH AREAS LOCATED ON THE CORTEX

Exact shape of the brain as traced inside the skull

The brain of the tarsier has the olfactory apparatus greatly reduced and vision elaborated, and in the monkeys vision and touch become dominant. In the higher apes the brain resembles the human brain, but the speech areas are feebly developed; the association areas, although larger than in the monkeys, where they are hardly present at all, are poorly developed and quite restricted in comparison with man.

The development in man of the great association areas must have been preceded by a great increase in the reception areas for sight, touch, and hearing, especially in connection with speech; we see a great development of these areas in Neanderthal man, and an elaboration of the association areas in modern man beyond anything heretofore produced.

Factors Which Determined the Primates

The two great factors which determined the rise of the primates above other mammals and of man above other primates

were: First, emancipation from bondage to the sense of smell, and the development of vision, touch, and, to a less extent, hearing. These three senses, being associated with life in the trees, gradually became dominant; then man came to earth, assumed the erect posture, developed the opposable thumb,* binocular vision, and the power of speech. Second, the correlation of the senses and their co-operation in motor activities, especially in speech, caused an elaboration of the association areas, which reached their climax in the White Race and represent the development of skill and intelligence.

Binocular Vision of Great Value

The effect of binocular vision on the development of the brain in man has never been sufficiently stressed. Both eyes look forward and the double vision gives a stereoscopic image which shows depth as well as length and breadth, and distance as well as size. The use of this mental image increased man's ability to compute. An animal with one eye on each side of the head sees with only one eye at a time, as the attention cannot be focused two ways at once; therefore, there is not much sense of depth, but only a plane picture, and the calculation of distance is difficult. This may be well understood when a cow with apparent deliberation walks into the car you are driving, for although the cow appears to be looking at the car, her attention is focused in the opposite direction.

Not only did binocular vision have a great deal to do with the wonderful development of the brain of early man, but it greatly aided in the protection of his body against the varied and vicious animals with which he had to contend and gave him a great advantage over them. The skill of man in practicing surgery and in developing art, and the transformation of the brain through mathematics and engineering skill by the increase in the computative faculties are a few of the results of binocular vision. The modern binocular microscope has multiplied the human eye many times and greatly added to the value of man's research. The limit to which the mind will ultimately reach is incalculable.

* Curved toward the fingers for more refined handling and manipulation.

Facial Expression

Along with the evolution of the brain the facial muscles developed more and more, reflecting the mind to the beholder. The expression of the emotions by the movements of the face is of considerable importance in the ascent of man, and plays a part in the economy of modern life.

The facial expression and the development of the facial muscles in the anthropoids is less than in man, in the monkeys much less, and in the tarsioids and lemurs still less. The lower the scale of evolution the less the elaboration of the facial musculature. In the lower vertebrates facial musculature is of very slight extension, but in mammals it attains a unique development and in man it reaches its highest expression. In lower forms it is attached to the deep muscles and does not move the skin to any great extent, but in higher forms it divides into two parts, superficial and deep, and in the anthropoids the superficial part which moves the skin spreads over the whole face and head. In man there has been a regression in the development of the muscles that move the scalp and ear, so that it is difficult for some and impossible for others to move either. This may be cultivated by effort and practice before a mirror, which is evidence that the mechanism that enables other animals to move their ears and scalp is present in man, though only slightly developed.

In the lower monkeys, facial expression is very slight; in the apes it is grimace-like, although there is considerable range of expression in the gorilla and chimpanzee, which most closely resemble man in many structures. Their facial muscles move in groups and there is but slight differentiation of movement by individual muscles. In a modified degree this is so also with some men. There are occasional individuals who cannot contract the brows and forehead without shutting the eyes as is the case in the apes. Finely graded facial expression has evolved from a lower stage. When the muscles are more highly differentiated the most vivid facial expression is noted.

With maturing experience under the influence of education the individual learns to control facial expression and thus conceal his emotions. Language is said to have been created to

conceal thought, and facial expression may have been created to conceal emotion. As a result, the reading of the face of an adult becomes difficult, except in the aged where the lines have become fixed and the characteristics may be plainly displayed.

Within the life of an individual facial expression may become more or less fixed. Continued mental concentration and deeply felt experiences repeatedly brought to memory set the mimetic musculature into contraction. Thinking and feeling along noble lines are reflected in the harmonious play of facial expression which may attain admirable beauty. Thus lasting traits may finally be engraved on the human face.

Racial Differences in Expression

Racial differences in expression are more often noted than are many other racial characteristics. In the White Race we notice a great range of varied expressions with many modulations, especially in the upper facial muscles and about the mouth. A slight muscle contraction induced by complex mental associations may produce a gentle smile, stronger stimuli a more marked smile, and when the impulse is deepened the mouth is opened and the smile turns into a hearty laugh. These finely modulated expressions of the White Race denote a responsive neuro-mechanism, well differentiated muscles, and thin, elastic skin. Variations occur in the White Race, and the great differentiation of the muscles about the eyes and over the nose add greatly to the individuality of the expression in different persons.

Fig. 26—LAUGHING NEGRO

The less-differentiated, coarse bundles of facial muscles, such as are found in the Black Race, as well as the great thickness of the lips and skin, make this finer mechanism improbable, and there is a marked difference in facial expression from that of the White Race. The neuro-muscular mechanism in the Black Race is less controlled, and when the nerve impulses, not so finely

graded as in the White Race, reach the mimetic muscles, the latter are set into sudden, strong contractions of a primitive type. The bulky lips are pulled upward and outward, the large white teeth are exposed in contrast with the black face, and instead of a graded smile or laugh we notice the broad grin characteristic of the Black Race. The different tone color of the voice adds to the grinning face and the combination becomes more characteristic.

The Yellow-Brown expression is quite different from that of the other two races and is equally characteristic. The face seems often to have a studied repose, a controlled sensibility, and a reserve. When this race responds with happy outbursts it is more like controlled smiling than like boisterous laughter.

The American Indian is noted for his stolid expression. The strong tonus of the muscles has molded his face and gradually brought out its characteristic strength.

The Eskimos are more spontaneous, and their happy faces show their good humor, despite their hard struggle against the rigors of cold in the far north.

The Polynesians, who resemble both the Black and the White races, but more the White than the Black, show a facial expression similar to that of the White; all who are acquainted with the Hawaiians will not soon forget their intelligent, pleasing, ever charming, and always kindly faces.

The Cause of the Variety of Expression

The variety of expression in the White Race is remarkable, and is represented by many small and by some minute muscles. The muscle that lifts the brows and wrinkles the forehead transversely is the muscle of surprise. The muscle that draws the brows together and wrinkles the center of the forehead in a vertical manner is the frowning muscle. The muscle that raises the corner of the mouth and the nostril is the snarling muscle, the muscle of anger. The muscle that closes the eye is the winking muscle, and some people find it difficult to wink one eye without letting the other eye know anything about it.

The smiling muscle, the risorius, draws the corner of the mouth slightly upward and outward, and starts a dimple in the cheek, which may be deepened into a line when the laughing

muscle comes into play, and if the grinning muscle is added to these there appears the "smile that won't come off."

When sadness comes to man, the smiling muscles become those of sorrow and the corners of the mouth are lowered. Sorrow is akin to joy and one may weep with gladness and laugh with sadness. When grief is intensified these muscles all contract with great force and a lugubrious face is the result.

One muscle of the face is said to represent twenty-one different emotions, but that muscle is quite elaborate and is not only made up of many parts, but these parts are varied in size, texture, and attachment. This muscle, called the *quadratus labii superioris et alaeque nasi,* depresses the tip of the nose, elevates the upper lip, flares the nostril, deepens the naso-labial groove in the upper lip, draws the tissues of the chin upward and backward and the corner of the mouth in the same direction. It expresses disgust, contempt, disdain, indignation, scorn, guilt, a snarl, a sneer, defiance, menace, anger, rage, hatred, bitterness, pride, sadness, sorrow, grief, gladness, happiness, and joy.

That one small muscle group can express so many emotions is almost inconceivable, but upon intimate analysis of the emotions it is seen that they are related or proceed the one from the other in natural sequence. The experience of a race may be read in their faces largely through the activities of this muscle.

A Characteristic Nose

The Jews have acquired a predominantly large and prominent nose. The same sort of nose is a characteristic of the Dinaric Race, which came from the Alpine Race, and is one of the outstanding types in southeastern Europe today. This large, prominent nose sometimes has the tip prolonged downward so that the direction of the nostrils is changed. The depression of the tip increases the prominence of the nose, and adds to its apparent size. This is not always well marked, but it is not infrequent, and is more emphatic in some persons than in others. Having become a recognizable feature, it has been seized by sexual selection. Those having this type of nose who marry each other may intensify a natural endowment and transmit its intensity to their offspring. The feature finally becomes fixed and is as much an inheritance as any other characteristic.

CHAPTER V

FORMATION OF RACES

ALTHOUGH as yet we are unacquainted with the exact steps in the ascent of man, we have at least suggestive evidence that man rose later than the other primates, and in some respects is more primitive. He is not so far advanced in the detailed evolution of some of his structures, but more advanced in general, and especially in his intellectual ascent.

The chief processes in the differentiation of man (discussed in Chapter VI) have been those of evolution, and of the formation of races. The two factors in evolution have been *natural variation* and *natural selection,* and the three factors most potent in the formation of races have been *isolation, adaptation,* and *hybridization.*

The Effect of Mutations on Race

In the evolution of man the same fundamental principles are involved as in the evolution of other organisms, although in man they are not always so definite and clear-cut in their action. Inheritance and variation, fluctuations, Mendelian combinations, and mutations * occur in the human kind today, as well as in plants and animals. This is not only true of the body, but also of the mind. Mutations result in the survival of the fit character only, and this usually results in the survival of the person who *has* the fit character.

In the progress of evolution many forms are eliminated, some by becoming unfit by over-development of some special structure (as the Irish Deer whose antlers caused its extermination), others by catastrophic action such as took place in the Ice Age, and others in other ways.

* See "Heredity and Variation" in this *Series.*

The Meaning of Changes in Man's Structure

Progress in evolution moves by a process of increased differentiation and integration. This process leads to very different ends, as shown by the various modes of locomotion, by the dis-

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Fig. 27—THE GREAT IRISH DEER

This great deer was a native of western Europe. It was exterminated by man during the fourteenth century. Fossil remains are found abundantly in the peat bogs of Ireland and from this fact it has received its name. Some individuals measured ten feet from the top of the skull to the ground. Antlers having a spread of twelve feet have been found.

From the painting by Charles R. Knight which was presented to the Field Museum by Ernest R. Graham

similarity of weapons of offense and defense, and in a multitude of other ways. In man it has led to increased cranial and intellectual capacity, to greater control over environment and greater freedom, and to enlarged and complex social units, etc.

In man there have been great changes in the body since the last Neanderthal of some 30,000 years ago, especially in the brain. The end of evolution in the brain is not yet in sight, in spite of what any one may say about the quality of the Cro-Magnon art or the superiority of the Greek state and manhood.

With the enlargement of the cranium and the increased activity of the brain, there came a gradual reduction in the size of the face, of the nose, and in the concurrent olfactory mecha-

nism in the brain. The grinding of grain and the cooking of meats and herbs caused a cessation of the eating of tough foods with the consequence that the teeth and their sockets became smaller in size. The large teeth and sockets of Neanderthal man gave his chin a receding appearance; as the size of the teeth and their sockets reduced, this receding chin changed to the prominent chin of modern man. The huge shoulders of Neanderthal man gave place to more reduced ones; the almost rigid thumb became flexible, and great skill in multiple movements of the hands and arms resulted. Resistance to disease has been increased by the elimination of the more susceptible; degenerative conditions appear in the hair, teeth, and toes, and probably also in the appendix which often atrophies and may disappear without operation.

Modern man evolved through modification and different attributes of modification differentiates the races.

CHAPTER VI

THE THREE GREAT RACES OF MAN

Resemblances, Differences, and Relations

Variability is one of the most potent factors in man's ascent. We recognize that no two people are exactly alike in mind or body. Even "identical" twins from the same ovum can be recognized by those who know them well. In each group of people there are those who resemble each other, and in each family some are more alike than are others. When those who are alike become numerous in a community they are called a *type*. The larger the group of people the more numerous the types. If one of these types becomes segregated it may maintain itself, and thus by isolation become a new group. After it has spread over a large territory and has become fixed in characteristics it is called a *race*. This process is repeated so that various types again appear in the race, and thus races become continuously subdivided. Races have come and races have gone, groups have met and fused to produce still other races—so that it is difficult to classify them all.

At present, anthropologists recognize *three great races of man,* the constituent individuals of which have many points of resemblance and many physical characteristics in common. These three great races have occupied the three continents of the Old World for longer or shorter periods, and have also moved over into the New World where they are mingling and mixing today. These three races have been called the White, the Yellow-Brown, and the Black, because the color of the skin is the most obvious and easily discernible physical characteristic.

Races and Species

As the term *race* seems to fit those three great groups of man we may look farther into their relation with other forms

that are close to them in physical characteristics. The following method of classification is used to make clear the relations. A European would be classed as:

Race: *White*
Sub-species: *Sapiens*
Species: *Homo*
Genus: *Hominidae*
Sub-Order: *Anthropoidea*
Order: *Primates*
Class: *Mammalia*

Man is the only member of the genus *Hominidae,* and modern man (*Homo sapiens*), the only living member of the species *Homo.* Earlier forms of man are called *Homo aurignacensis, Homo neanderthalensis, Homo rhodesiensis,* and other names.

The definition of *species* has never been made clear, and a perfect definition seems impossible. A species is a form that is distinct in its anatomic, physiologic, pathologic, chemical, and psychic characteristics, does not grade freely into any other group, does not in most cases produce perfectly fecund offspring with those outside of the species, and is a persistent as well as a large organic unit. When these criteria are applied to man there is but one species discernible. All races breed freely, with subsequent fecundity, and are changeable in the direction of other groups under altered conditions. Therefore no group of man is a species but a variety, and these groups are justly and intelligibly called races.

The Development of Races

The formation of races in any large geographic group is more or less continuous, and varies with environment and other conditions, such as isolation, habits, inbreeding, and mixed breeding. Until the Mousterian period there is no material evidence of distinct races, but in the Aurignacian time, after Neanderthal man had become farther evolved, the distinction became more apparent, and several distinct lines, such as the Grimaldi, the Brno or Combe Capelle, and eventually about 10,000 B.C. the Cro-Magnon, had realized their differentiation. Some other forms doubtless became differentiated and perished, and no mod-

ern representatives of them survive. Later there developed many forms which make up the component elements of the three great races of today: the Alpines, the Nordics, the Mediterraneans, and the Hamitics of the White Race, the Mongoloids, the American Indians, and the Malays of the Yellow-Brown Race, and the Negroes, the Negrillos, and the Negritos of the Black Race. Other sub-races have developed, and many mixed races have been formed by the union of two or more of the other races.

Effect of Climatic and Geographic Conditions

After isolation, adaptations occur from climatic and geographic conditions, such as pigmentation, nose form, and stature. Pigmentation is variable, and those races with greater pigmentation are more able to sustain the intense solar heat of tropical regions because they are protected from the too violent action of ultra-violet and infra-red rays of the sun. They become healthier, live longer, and have more children. The coloration may be intensified by sexual selection if the darker colored are more fit and are selected in marriage. Ultimately those with little pigmentation die out, and, through the survival of the fittest, those with greater pigmentation increase in number. The same process takes place in a reverse order in a cold, moist, cloudy climate, where the least pigment is needed to secure the benefits from the actinic rays of the sun, either ultra-violet or infra-red. Depigmentation is as important in these climates as is increased pigmentation in the tropics.

The nose form varies under different climatic conditions. The broad nose with wide-open, flaring nostrils is associated with a hot, moist climate; the narrow nose with pinched nostrils, with a cold, dry climate; and the intermediate forms with hot, dry, and with cold, moist climates. Thus we find the Australians with a broad nose and the Europeans with a narrow nose, yet both were derived far back from the broad-nosed Neanderthal man. The nose becomes altered by selection in different environments.

In general, the stature tends to be taller in temperate climates and smaller in the torrid and arctic. The Patagonians and the Scots are both tall. The studies of Hrdlička and Bean of *Old Americans,* those whose ancestors have lived here for three or more generations, and of *Old Virginians* of the same

Fig. 28—A PIGMY FAMILY IN THE BELGIAN CONGO
From a habitat group in the American Museum of Natural History

status, show that, as a whole, these people are taller than any other in the world.

The Negrillos and Negritos are pigmies in tropic forests, and the Eskimos, Lapps, and Siberians are mostly smaller than the peoples in the adjacent temperate zones. These people represent adaptation through specialization as the result of selection through variability, and not through degeneration. In their present physical condition they are more able to cope with their environment than they would be otherwise. During isolation, when no extraneous influences come in that might check the change, characteristics become intensified by inbreeding.

The Blending of Races

Following isolation and the formation of a new race, when one group enlarges and spreads from its original location it may meet another group which has become changed in another direction, and by crossing they become mixed races. There are far more mixed than pure races in the world today, because iso-

lation is almost a thing of the past. Wherever people go they mingle and interbreed; therefore as traffic increases to all parts of the earth and all peoples come to know each other, the peoples of the world will no doubt become more and more hybridized.

When races come into intimate contact and intermarry, there may, at first, be a partial return to one or the other of the parent stocks. In some cases there is a segregation of some characters which are very different from each other, but in the near future there will begin a progressive blending to form a more or less intermediate type. When one group is more numerous than another the larger may submerge the smaller. In a large country, on the other hand, there will in time be formed a nation which will advance toward uniformity in language, habits, and, if immigration is not great, in physical resemblance.

Precisely this is taking place today in every large nation. Each nation is the result of the merging of many groups of people of varied racial characteristics, but each new group is blending into a type of its own, as can be seen in the Spanish, the French, the Italian, the German, the English, and even in the American. Each of these races is in the process of being born, and would probably integrate into a new secondary race if there were no further material accretions from the outside for several millenniums.

Distinguishing Race Characteristics

The characteristics that distinguish human races are sometimes correlated and at other times not harmonious, as black hair with blue eyes, or long head with broad face. The chief *physical* differences which should be studied are: hair, eye, and skin color; hair form, stature, sitting height, and the relative lengths of the long bones; the width of the shoulders and hips, and the relative width of the hands and feet; also the characteristics of the cranium, face, nose, eyes, ears, and teeth (especially the incisors). The chief *chemical* differences are found in the blood. The chief *functional* differences are in the pulse, temperature, and the eruption of the teeth. The *mental* differences are chiefly sensory and psychic. *Pathologic* differences are those of immunity and of demography.* Since the patho-

* Demography, a statistical study of people, as to births, marriages, deaths, health, etc.

logic conditions relate to survival or elimination, they are among the basic factors in human evolution; some of the well recognized conditions are certain diseases of children in the Negro, the increase of mental diseases in the White Race, and the peculiar psychoses of the Malays as exemplified in "running amok."

These physical, chemical, functional, and pathologic differences are associated with astonishing similarities or identities in all the racial groups of man. This points strongly to a common derivation for all the existing varieties of man.

Basic Physical Differences

We will now present a few of the most important differences in man, although we can only give a brief analysis of each.

Hair. The hair of man may be plentiful or scant over the body, it may be slightly or heavily pigmented, it may be straight or exceedingly curly or kinky, and it may be round, elliptical, or flat in cross section. When the hair is scant it is because of a condition called glabrous. Except on the head, this condition is found, more or less, in all Yellow-Brown peoples. When the hair is heavy the condition is called hirsute. This occurs more or less heavily over the entire body in White people living in the region extending from near the eastern Baltic over a broad space of the earth through Persia and India to Australia; it is especially noticeable among the aboriginal Australians. The hair may be devoid of pigment as in the albino or in the white hair of age; there may be the flaxen or golden hair of the true Nordic Race, at one extreme; or there may be the absolutely black hair of the Semitic Race at the other extreme. The hair may be kinky (ulotrichous) as in the Negro, wavy (cymotrichous) as in the White Race, or straight (leiotrichous) as in the Yellow-Brown. Observed in cross section, hair of the kinky type is flat, hair of the wavy type is elliptical, and hair of the straight type is round (Fig. 29). The characteristics of the hair are perhaps of greater importance in the differentiation of the races than are the characteristics of any other part of the body.

Skin. The color of the skin is the most easily recognizable and understood physical characteristic, and it is probably used more than any other in describing the differences which are obvious in the three great outstanding races.

Eyes. The color of the iris is apparently one of the most characteristic and stable differences in man. Blue, as in the true Nordic Race, is at one extreme, and black, as in the Negro, is at the other. There are minor differences in the eyes, such as the rounded, oval, or the slit-like opening of the lids, the Mongolian fold (a fold of skin covering the inner angle of the eye), the distance between the eyes, many variations in the size of the eyeball, the amount of white shown around the iris, and variations in pigmentation such as one blue and one brown eye or sectors of one color or another.

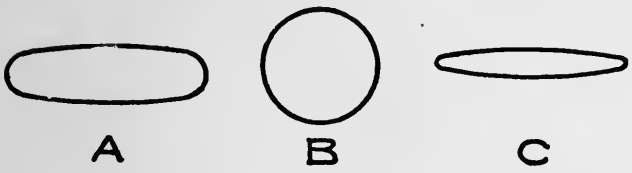

Fig. 29—CROSS-SECTIONS OF HAIR

A, the wavy hair of the White Race; B, the straight hair of the Yellow-Brown Race; C, the kinky hair of the Black Race

Stature. Stature is extremely variable, yet there are some peoples who have one extreme and others another, as in the dwarf Pigmies, or the Negrillos of Africa, and the giant Patagonians of South America. Stature is used in the differentiation of races. The mean or average height is about five feet, five inches; therefore the medium stature would be from five feet, three inches to five feet, seven inches, the small or short below five feet, three inches, and the tall above five feet, seven inches. The Pigmies are below five feet, three inches and the Patagonian giants are above six feet.

Fig. 30—VARIATION IN STATURE

The tall man is five feet eight inches

Sitting height. This is better expressed in terms of its relation to the stature, or as it is called, the sitting-height index. This is usually about 50 percent, or an index of 50, except in the Negro. In the Negrillo it is nearer 55, in the Mongoloid between 53 and 55,

and in the White between 51 and 53. The sitting-height index is higher in small people and lower in tall people. It is higher in the young and decreases as development progresses to the adult; it is less in men than in women. For these reasons the index is useful in the classification of groups of peoples.

Long bones. The long bones are useful in classifying the living, because in the Negro, in males, and in the adult, the bones of the lower arm and leg are relatively longer than those of the upper arm and leg, whereas in the White Race, in women, and in children the opposite is true. The long bones of a skeleton may be useful in calculating the stature and in showing other conditions of the person when he was alive.

Widths of the body parts. The widths of the bones, of the shoulders, of the hips, of the hands, and of the feet in relation to the stature or to the lengths of the bones is of much value in determining the types of men, as there are both slender and stocky types which have various other different characteristics, such as those which relate to immunity and susceptibility to disease, to length of life, and to death rate at different ages.

The Head. The head is made up of the cranium and face, and the skull is made up of the cranial and facial bones. The length and breadth of the cranium are used to find the *cephalic index,* which is the breadth in terms of the length with the latter equal to 100. An index below 75 is called dolichocephalic (or narrow-headed), from 75 to 80 is mesocephalic (or medium-headed), and above 80 is brachycephalic (or broad-headed). The index taken on the bony cranium is called the *cranial index.* The cephalic index is used in the differentiation of races, but as there are about twenty factors which influence the shape of the cranium, the index has not proved as useful as had been expected. The most narrow-headed people are the Eskimo and Negro, and the most broad-headed the Alpine and Mongoloid. The facial index is also used, but is no more reliable than the cephalic index as an indicator of race. Both indexes may be helpful in connection with other physical characteristics.

Nose. The nasal index, which is the width of the nose in terms of the length with the latter equal to 100, is one of the most useful factors in differentiating the races. This may be taken on the skull or on the living. The index of the living is

called leptorrhine (narrow-nosed) when the index is below 70, mesorrhine (medium-nosed) when between 70 and 80, and platyrrhine (broad-nosed) when above 80.

Ears. The ears have been used less than they should be as racial criteria. The Negro ear is the smallest, and is irregular in contour, the Mongoloid ear is large and well formed, and the size of the White ear is in between.

Teeth. The teeth also are useful in the differentiation of races and especially so with reference to the early forms of man, and in determining man's relation to the apes and monkeys. The shovel shape of the upper incisors in the American Indian are especially noteworthy; equally interesting is their absence in the Whites.

Other physical differences. There are numerous other bony and fleshy differences that are important, such as the small spleen of the Negro, and the large spleen of the White, but many of these are not so important as those mentioned above and need not be given here.

Basic Chemical Differences

Types of blood, determined by physico-chemical means, are peculiar to different people, but are not used in determining race except in color or pigmentation.

The odor of the body differs according to race. It is pungent in the Negro, acrid in the White, and varies in the Yellow-Brown. The White man, for example, can usually detect the presence of a Negro or Yellow-Brown by the odor peculiar to his race. On the other hand, the Negro or Yellow-Brown can detect the odor peculiar to the White man.

The great importance of fluids which are poured into the blood from many parts of the body cannot be minimized in relation to the development and health of the individual, but our present knowledge about them is so scant that it is of little value in differentiating races. The function of the thyroid gland is best known; it supplies the requisite amount of iodine to the system. Iodine is present in sea food, sea water, and probably to some extent in sea air; thus a greater amount of iodine is taken into the body at the seashore. As a characteristic effect of iodine in an adult person is to make him thin, people who

live by or near the sea for a great length of time seem to become small and thin. As a result of many experiments it is thought that peoples of the interior in certain districts who have less iodine than those near the seashore may become broad and tall. From this fact we may infer that the Mediterranean Race is the product of the seashore and the Alpine Race of the continental interior.

Basic Functional Differences

Pulse and Temperature. These two characteristics are more or less related and together with respiration they vary somewhat in the different races, but they are so bound up with other conditions that a medical treatise would have to be written to show their relations.

Eruption of the Teeth. This is a most important condition both in relation to evolution and development and in relation to racial differences. The teeth are undergoing extinction in at least two ways: They are disappearing by coming in later and later and by decaying earlier and earlier, especially in the case of the canines and the third molars or wisdom teeth. Ultimately we may expect a time when they will not appear at all. In certain races, as the Negro, American Indian, Alpine, Nordic, and especially the Australian, the teeth resemble those of the Neanderthal more than those of the Mediterranean and other races. There are some teeth that come in earlier in some races than in others, but researches on this phase have not yet been well worked out.

Basic Mental Differences

Mental differences between the races are rather obscure. Psychoses, or abnormal mental conditions, are on the increase in the White Race more than in the others. This condition seems to be a concomitant of civilization; but as the diseases relate to pathology we will consider them in the next group.

Basic Pathologic Differences

Pathologic differences are affected by climate, habitat, acclimatization, and many other factors which are bound up with medicine and are so extensive that only a few salient features may be mentioned here.

Immunity. Certain people who have lived for many generations or thousands of years in one climate acquire certain constitutions, or predispositions, that enable them to better survive under their living conditions than is one of diverse nature and accustomed to wholly different environmental conditions who attempts to dwell with them. There are also individual differences in immunity which are apparently more marked in a simple and specific way than the differences between races, although the latter have not yet been studied in such a broad way that the differences have been recognized and clarified. However, when any people have been relocated in an environment utterly alien to that in which they have evolved and lived in for thousands of years they have almost invariably disappeared. This is true of the Aryans in India, although some may still be seen with dark skins and other alterations. The Negroes in the United States are much less dark than those in Africa, and are also supposed to have some immunity to throat disease, goiter, and affections of the spine, eye, ear, and nose. However, they have an almost alarming susceptibility to tuberculosis and venereal diseases, and their birth rate is diminishing more rapidly than their death rate. This declination is partly the result of disease, but the effect of the climate is also a factor. The reverse is true in Africa, but the death rate of Negroes in Africa is not greater than the death rate of Whites in Europe.

The Whites are more susceptible than the other races to psychoses, to skin diseases, and probably to cancer and diseases of a similar nature.

The Malays are susceptible to a peculiar condition called "running amok," in which they are suddenly taken with a wild desire to murder. Every Malay carries a large sword-like knife, and when he runs amok he draws it and slashes right and left until he has killed every one he can before he himself is killed. This is one of the erratic psychic manifestations of the Malays.

CHAPTER VII

RACIAL MOVEMENTS

In the two preceding chapters we have outlined the ascent of man with especial stress upon the Neanderthal forms that lived all over Europe, with a single possible representative so far discovered in Africa and another in Asia; we have also given some of the methods of differentiation that have produced the races of man. We now take up the difficult but extremely interesting and instructive task of tracing the movements of man as he has wandered to and fro over the face of the earth.

The mass of evidence points to Europe, or at least, to the western or warmer part of the Old World, as the region of man's origin. It was certainly his cradle, the location of his nursery, the region where his infancy and early childhood were passed. Western and southwestern Europe, with an extension to central Europe and around the Mediterranean, seem also to have been the earliest locations of the movements and the first spreadings of man. During the last glacial invasion of Europe and the vicissitudes which followed, Neanderthal man became earlier than 18,000 B.C. greatly reduced in numbers, and, as his progeny, the early Aurignacians, developed gradually toward modern man in physique, they spread over wide territories.

The latest discoveries in central Europe and Asia make it seem that while the Neanderthal type was declining in the West, portions of it had extended toward the East, and gradually developed into Aurignacian man, who, spreading once more to the West, re-occupied nearly all of the sites previously occupied by his forefathers; but he probably did not settle far south of the Mediterranean.

From about the latter phases of the Aurignacian onward the White Race developed in Europe. Stocks similar to the upper Aurignacian peopled Asia, and from there went to America,

while later modified streams spread over Malaysia. The Negroes developed as such in Africa, and in the form of the Negrito spread eastward into the southern borderland of Asia and into some of the Pacific Islands at an early date. The White Race spread early eastward and southeastward through Asia Minor and over the Iranian plateau, through the Caucasus and Persia, into India and thence into Ceylon. An earlier related strain, not far it would seem from the last Neanderthal men, spread through India, the Malay peninsula and the adjacent islands (at that time part of the mainland) to Australia and to other Pacific islands. This strain formed a substratum of a large south Pacific region and to this day retains numerous primitive characteristics that resemble the late Neanderthal and the Aurignacian man, especially those in the Australian Race who are unmixed with Papuans (the dark race of the South Pacific).

Later movements of the Whites from the Mediterranean area took them into India, Asia Minor, and northern Africa to form the Dravidian-Hamitic and later the Semitic races, while those who remained in Europe or returned there gradually developed into the Alpine, Mediterranean, and Nordic races. The old spread of the near Whites into India and Australia, and the subsequent spread of the Dravidian-Hamitic Race over Arabia, Egypt, Mesopotamia, and India, severed the connection between the Black Race in Africa, in India, and in the Pacific.

This is a brief tracing in large lines of a few of the more important early spreads of man as apparent or most probable from our present knowledge, and we may now proceed to review their methods of moving about and give more of the details of some of their important movements.

The Three Chief Forms of Dispersal

There have been three chief forms of dispersal. First, by spreading movements of large numbers in a gradual overflow in one or more directions from a central over-populated location. Second, by invasion, or rapid thrust movements which may have continued and which were repeated at longer or shorter intervals, involving the conquering, control, and organizing of the population, often with a partial extermination. Third, by migration in individual or family groups.

Reasons for Spreading

There have been different reasons assigned for the natural spreading of people over the world at a time when great areas were without inhabitants. The primary causes of spreading were the natural increase of population, and a gradual widening of the inhabitable portion of land, although the quest for food was often an impulsive force. Pressure from without as well as from within the group sometimes also caused a spreading away from the home base. Sometimes the groups followed the animals of the forest which afforded their chief food supply; again as the cold increased, they moved to a more genial clime, or when the earth became warmer they followed the spread of increasing warmth with the recession of the ice. In any case, unless driven, they followed the lines of least resistance or the best prospects.

Dispersals by invasion have been sudden thrust movements by organized parties of peoples, which continued for a long period by continuous pressure or repeated thrusts, or for a short time if there was too great resistance or if the conquest was easy. The basis for such movements was nearly always gain, but the movements were caused by certain conditions that arose in the group. Sometimes there came a shortage of food, which may have been gradual, but which finally reached such an extreme that the people moved away. In doing this they came into contact with other people, whom they conquered, exterminated, and replaced or with whom they settled down either as overlords or as neighbors, intermarrying and living together. Sometimes the cause was greed for power or wealth, sometimes irritation from oppression, from insurrection, or from some other cause, and there may have been endemic diseases.

Dispersal by migration takes the form of planned and regulated movements of individuals, families, or small groups. It may cause profound changes, as in the settlements of the Americas.

It is not always easy to differentiate between the three methods of dispersal. Sometimes one changed to the other, and all three, or any two, may have combined. We shall now consider these movements in their order.

This is to be brought in in a very general and brief way - I'm not doing a paper on movements of man.

CHAPTER VIII

THE DISPERSAL OF MAN *

Dispersal by Spreading

The chief spreading movements were: 1, The spread of Neanderthal man over habitable Europe and his further spread to the east around the Mediterranean; 2, The spread of the Australoid type until it reached Australia; 3, The spread of the Negro over Africa and eastward through Egypt, Arabia, and India to the Philippines, New Guinea, and the Malay Peninsula; 4, The spread of the Aurignacian types over the Iranian plateau, northern Asia, and back to Europe, and also into India and the Pacific; 5, The spread of early Neolithic man from the Asiatic plateaus through Asia to America and also over Europe to Great Britain; 6, The spread of Neolithic man from the eastern Mediterranean to India and into the Pacific Islands, and also through Egypt and other parts of Africa, along the southern shores of the Mediterranean.

The First Spreading Movement

Neanderthal man seems first to have occupied western Europe and then to have spread to central Europe, around the Mediterranean, to the Caucasus, Asia Minor, and as far east as northern China. In the earlier period of his existence the climate was mild, affording an agreeable outdoor life. Although caves were sometimes utilized, nearly all of the earlier hearth sites were in the open or in rock shelters which afforded but little protection from the elements. As the late glacial return came on there is evidence some sought the greater seclusion of caves, but many wandered away to more genial climes.

* The maps in this section were plotted by the author and show only the general drift and not the exact route.—Editor.

The chief occupations of the Neanderthal were in the making of flints and in the chase of the animals which they utilized for food and clothing. As the cold came on there is evidence that the use of the skins of animals increased, because the scrapers for removing skins are much more numerous in the remains of occupation sites. Neanderthal man was a rover; this fact is attested by evidence of the repeated occupation of the same sites

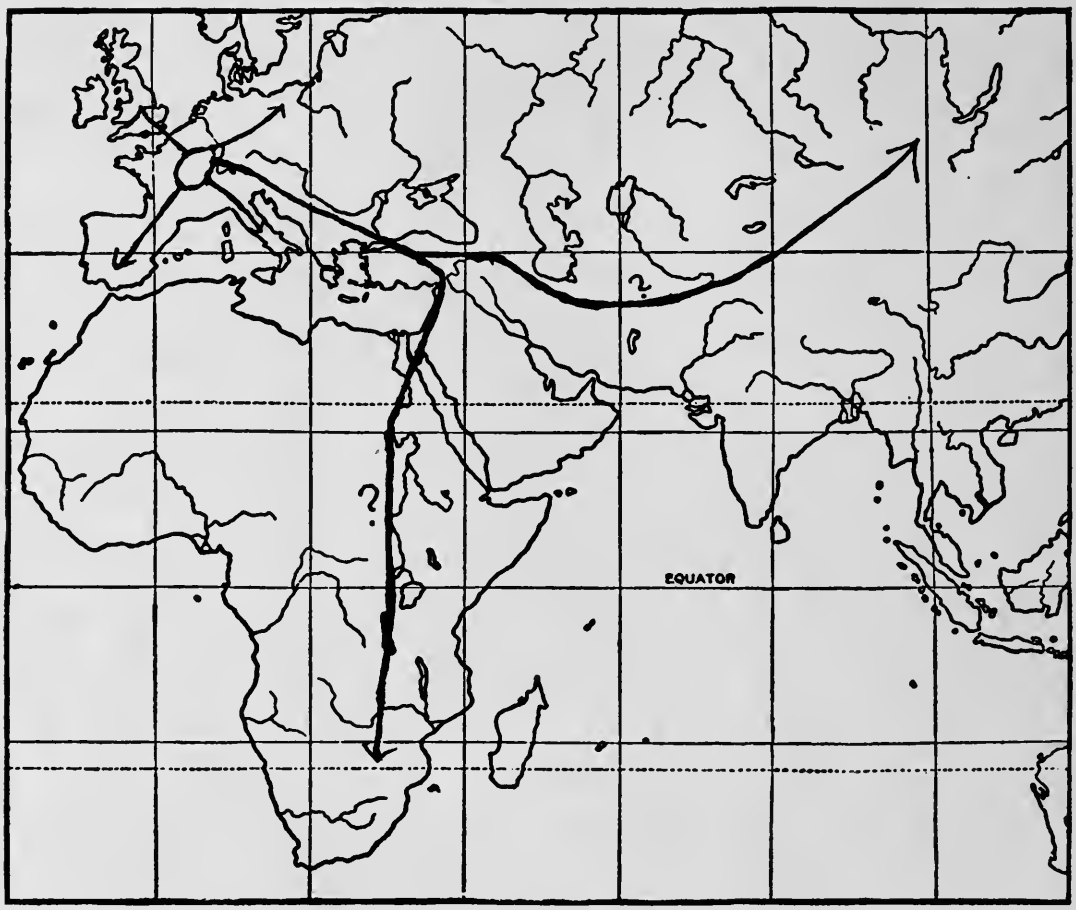

Fig. 31—THE FIRST SPREADING MOVEMENT

in France and Belgium after prolonged absences. He may have had summer resorts and winter resorts, but his absences extended over centuries rather than seasons. In warm spells, which were also of long duration, the Neanderthal man probably wore but little clothing. For thousands of years man's clothing in the cold seasons consisted of the skins of the animals which had been killed for food.

The implements he used were of stone chipped for use as killers, cleaners, and skinners, but later the use of bone was developed. At first the implements were crudely made, but after

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Fig. 32—STAG HUNTERS OF THE NEOLITHIC. OR NEW STONE, AGE

Resting from their exertions on the border of a beech forest on the southern shore of the Baltic. The chieftain stands in the center, and his son, wearing a necklace of bear claws, grasps a bow and arrow and holds in leash a wolf dog, ancestor of the modern sheep dog of northern France

Drawn under the direction of Henry Fairfield Osborn by Charles R. Knight for the Hall of the Age of Man in the American Museum of Natural History; reproduced by special permission

a while man became more skillful and finely patterned implements were manufactured.

There were transition periods, if slow ones, between the Neanderthal man and the previous Acheulian forms, and between the Neanderthal man and the following Aurignacian forms. There is no sudden replacement of the one people by the other. The Mousterian period, when the Neanderthal lived in Europe, grades gradually from the previous Acheulian period to the following Aurignacian period.

The Second Spreading Movement

The second great spreading movement was that of the Pre-Dravidians from western Asia into India, the Malay Peninsula, Sumatra, Java, and Australia. These people were close to the Mousterian period of culture and the Neanderthal physical type. They were still more or less Neanderthaloid, modified somewhat toward modern man, but not as much as were the upper Aurignacians and Magdelenians. They retained some of the implements of the Neanderthal combined with others of the later culture. They probably took with them the dog as a domesticated animal, and maybe the dingo, or native wild dog of the Australia of today is a descendant of these. Either the Aus-

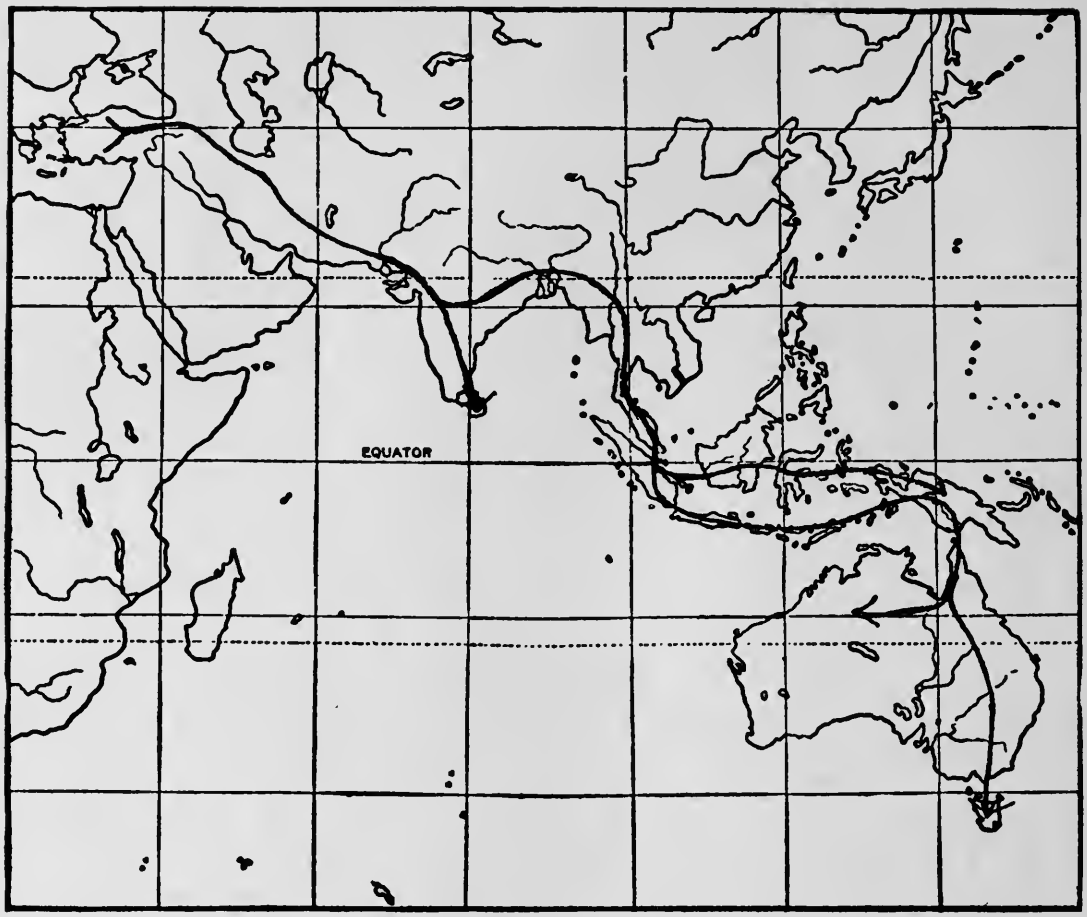

Fig. 33—THE SECOND SPREADING MOVEMENT

tralian left western Asia before the beginning of agriculture, or he lost the art; but he was there when the dog had been domesticated and hunting was at its best with the fleet-footed denizens of the forest as game.

Courtesy of the American Museum of Natural History

Fig. 34—THE DINGO, OR WILD DOG, OF AUSTRALIA

The Third Spreading Movement

The third spreading period for us to consider is that of the Negro. His origin, though doubtless from the same human family as the other races, is still obscure. We later find the Ne-

grito in India, in the Malay Peninsula, and in some of the Pacific islands. The Negrito as well as the Negrillo is clearly of the same stock as the Negro in Africa, as is also the related

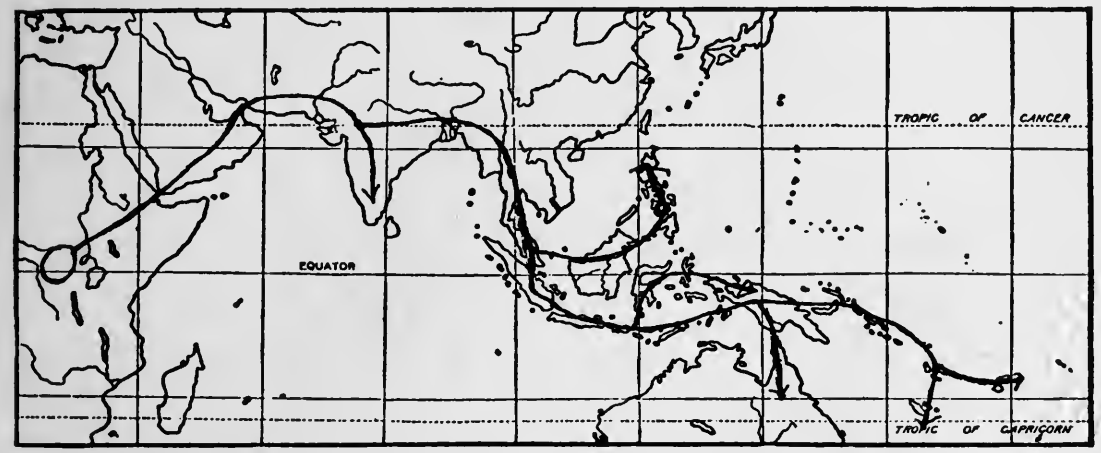

Fig. 35—THE THIRD SPREADING MOVEMENT

form, the Melanesian, found farther in the Pacific. We must conclude that at one time these strains were connected through Arabia. This connection was then severed, and no trace of it is left, or has yet been found.

The break in the Black Race line between Asia and Africa probably came when the Dravidian-Hamitics spread over southern India, and into the Pacific as the Indonesian. No remnants of the Black Race in pure form are to be found among living peoples between Africa on the one hand and southern India and the Malay Peninsula on the other, but we cannot now say what in the way of evidence the future may reveal.

The reason for believing that the Negro originated in Africa rather than in Asia and that he spread from the former to the latter is that the bulk of the race is now found in Africa in spite of the fact that man other than the Negro has been moving into Africa for a longer time than into India. There are at present but few negroid peoples to be found in India, and in the Pacific islands, where they are not yet extinct, they are fast disappearing. If India had been their place of origin they should be there now in greater numbers than in Africa.

The Fourth Spreading Movement

The fourth great spreading movement occurred during the late Paleolithic era and was in another direction. In this movement man journeyed over the great plateaus of Siberia and Turkestan, and from there spread over northern Asia and into America. This spreading lasted for a long time, thousands of years, and was largely, it seems, of the nature of a gradual infiltration from the plateaus as they became more and more arid. These people were hunters, and the great regions of forests helped them to maintain themselves as they moved ever onward

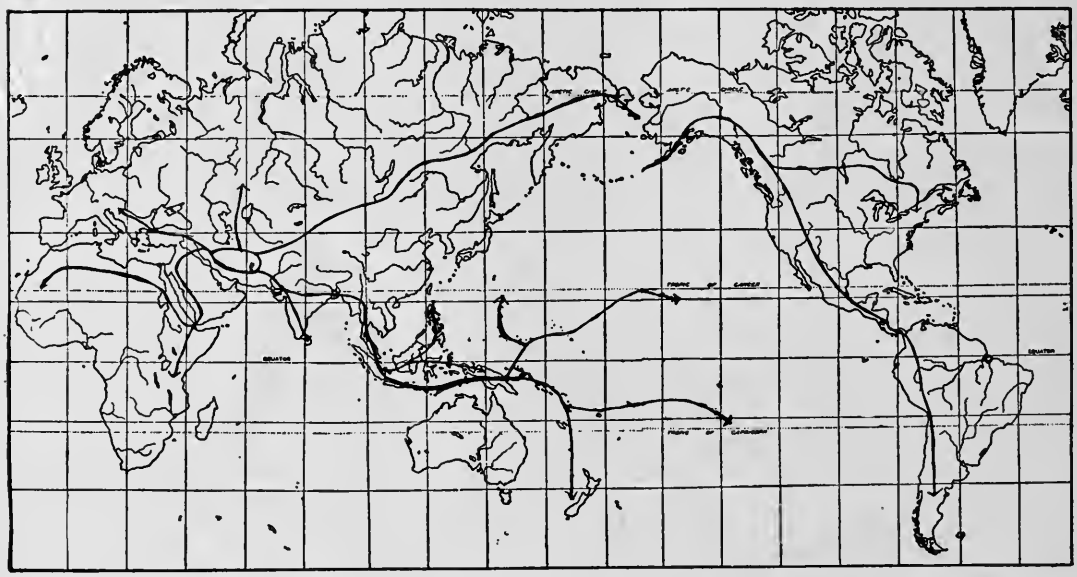

Fig. 36—THE FOURTH SPREADING MOVEMENT

while their numbers gradually increased. After they had peopled Mongolia and Siberia, groups carried on until they reached the extremes of northeast Asia. They crossed into Alaska, which could be seen in the distance, and spread over the Americas, becoming the American Indian. As time went on, these early hunters retained the distinctive characteristics of the Neanderthal man to a less and less degree, yet we find in America today rare individuals who bear strong resemblances to at least the latest Neanderthal people.

The great Iranian plateau is of more than passing interest as the great source of some of the subsequent movements of man, and the routes through which he naturally drifted are fairly well known. This plateau is surrounded on three sides by water,

Fig. 37—AMERICAN INDIAN
Cheyenne

and has natural passageways leading out of it. On the east it dips into India through the valleys of the Indus and the Ganges; on the south it has a passageway that leads across the valleys of the Tigris and the Euphrates through the "Fertile Crescent" (Breasted) over Arabia and into the Nile Valley; to the west is a natural gateway through the upper reaches of the Euphrates into Asia Minor, where armies went to and fro before and after Xenophon and his 10,000 explored it, and which is still a thoroughfare for traffic in the East. In Asia Minor the route was walled in by mountain and sea and there were no byways. Three outlets presented themselves at the Aegean, one by sea to Greece, another across the Hellespont and around the Aegean into Greece or still farther northward into the Adriatic and Italy, and the third still farther northward to the valley of the Danube. No wonder Troy, situated at the meeting of the ways, became a city of importance. On the north of the Iranian plateau was a vast open way over the steppes and across the rivers of what is now Russia which led to the open plains of Hungary, to the fertile Valley of the Danube, and to central Europe. Through these ways, east, south, west, and north, probably in the order named, the peoples of the Iranian plateau moved out. Like their forefathers, the Neanderthals, they were hunters; they were tall, mostly long-headed, and of fairly robust build.

These hunters from the Iranian plateau were instrumental in producing the Hamitic, Semitic, and Mediterranean races.

The Hamitic type was apparently the first to be realized and spread to Egypt, over northern Africa, over southern India, as the Dravidian, and into south Africa where they mixed with the Bushmen and Hottentots and left their cattle culture there. When they moved up the Nile to the Great African Lakes they established the great dominion of the Pharaohs and came into intimate contact with the Negroes of the Sudan and Kordofan. They moved northwest and spread over north Africa, where they came again into contact with the Blacks north of the Sahara.

Courtesy of the American Museum of Natural History

Fig. 38—THE AFRICAN BUSHMAN

The Negroes occupied the central part of Africa and spread thence to the south, preceded by the related Bushmen and Hottentots, while the Negrillo peopled the heart of the equatorial jungles. The Hamitic and Semitic Whites from the north are mixed somewhat with the Bushmen and Negroes south of the Great African Lakes. The northern Hamitic branch apparently carried the Capsian * culture in its microlithic stage into Europe through Spain as a gateway.

The spread of the Hamitic-Dravidian Race through India and into the Pacific as the latest part of the fourth movement deserves especial notice. The Dravidians spread over India, and must have come into contact with the previous inhabitants, the Negritos and Pre-Dravidians,

* The Upper Paleolithic stone industry of north Africa is termed *Capsian;* when Lower Capsian culture was carried into western Europe, it was modified in character and is called Aurignacian. When the Upper Capsian culture migrated to Europe it developed into the culture phase known as Tardenoisian.

or Australoids. They probably scattered them over India and some of the Pacific islands or carried them along as they went on their way. A few survivors of the Pre-Dravidians and Negritos may yet be found in the remote recesses of the Deccan * or in the northeastern section of India. Traces of them are also found along the northern coasts of India and in various Pacific islands. The Dravidians have occupied the Deccan to this day in scattered masses as the largest element in southern India, although intermixed with their Aryan brothers, whom they now greatly resemble.

Fig. 39—A YOUNG NEGRITO WOMAN
Philippine Islands

The spread of the Dravidians and the Hamitic Race from area to area was not always accomplished quietly and peaceably. There were probably many invasions and thrust movements. The Semitic and Mediterranean races probably developed in conjunction with the Hamitic Race about the eastern end of the Mediterranean Sea and in Mesopotamia. According to all indications the Kelts, Alpines, and Nordics developed where they were found in historic times.

After the hunter spread away from the plateaus of Asia, which were growing higher and becoming drier, the domestication of animals began and many hunters became herders. Later they developed agriculture, settled in the fertile valleys, and cultivated grain of various sorts. The spreading of the hunter to many parts of the world, where he became a formidable warrior and the precursor of civilization, brings us to the advent of wars,

* The peninsular portion of India lying between the river Narbada on the north and the Kistna on the south.

and to those movements of dispersal which were the results of invasions. We will take these up in order presently.

The Fifth Spreading Movement

In the early Neolithic period man continued to spread over the Asiatic plateaus to America, later becoming the American Indian. He also spread over Europe and into Great Britain as well as over Asia and America. The three races of Europe

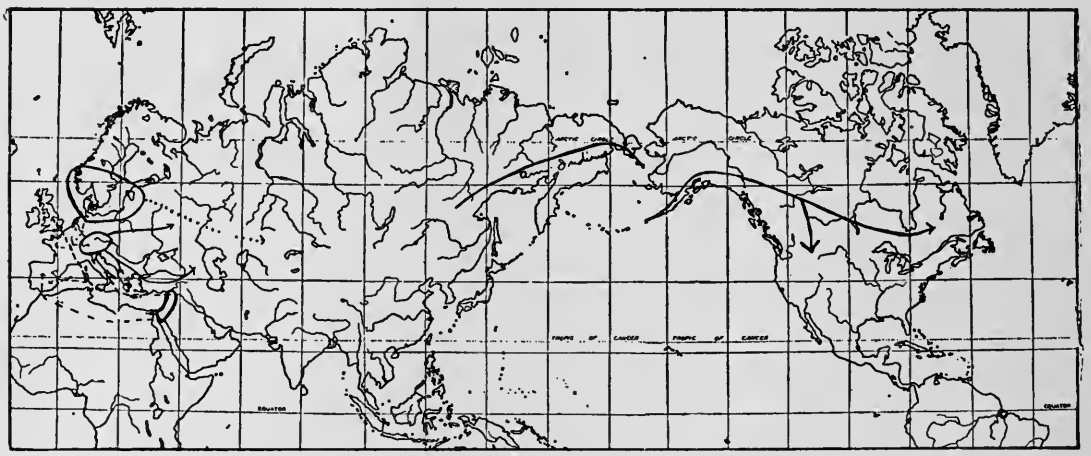

Fig. 40—THE FIFTH SPREADING MOVEMENT
Alpine Race ———; Nordic Race .....; Mediterranean Race - - - - -

today, the Nordic, Alpine, and Mediterranean, are found somewhat as they were in the Neolithic period, but at the beginning of that period we find the Alpine spreading from the Swiss lake region in all directions, but chiefly to the east and south, the Nordic spreading from Scandinavia around the Baltic region and over the steppes of what is now Russia, and the Mediterranean moving from the region of the Levant around the Mediterranean Sea into Great Britain.

The Sixth Spreading Movement

During the Neolithic period man spread from the eastern Mediterranean area to India and out into some of the Pacific islands as mixtures of the Hamitic, Semitic, and Mediterranean races; later as Mohammedans they reached as far as Manila in the Philippine Islands before the Spanish arrived there. There was a further spread of similar stocks through Egypt and other parts of Africa, and particularly along the southern shores of the Mediterranean Sea. These movements followed those of

the Hamitic Race into Africa, and preceded those of the Arabs, or Moors, who later came as far as Spain.

Dispersal by Invasion

The chief early invasions that may be recognized from archeological or other investigations are those which immediately

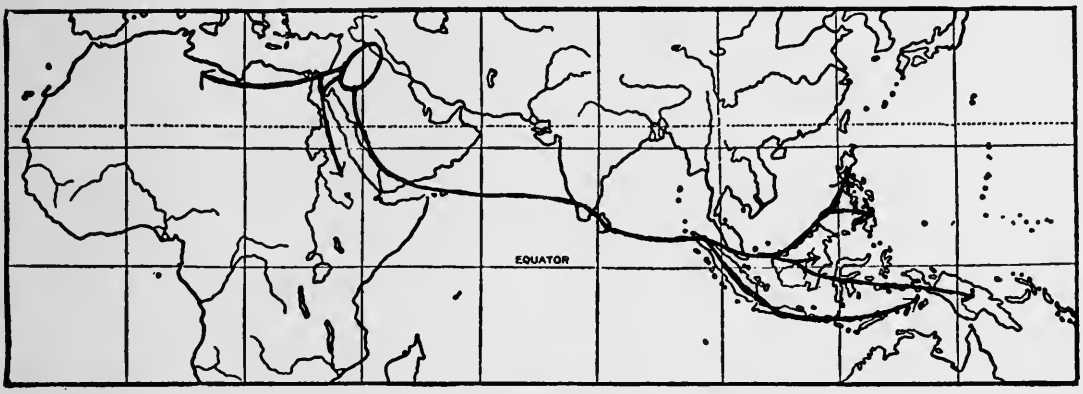

Fig. 41—THE SIXTH SPREADING MOVEMENT

precede the historic period: 1, The movements of man from the East, probably from the Iranian plateau, into Mesopotamia and possibly even into Europe and into India such as the Aryan Race; 2, The spread over northern Russia, Siberia, and Korea of the Ural-Altaic or Semi-Mongoloid people, a group which included the Tartars, the Turks, the original Bulgars, the Huns, and a great many other groups of similar people; 3, The movements of the Semitic and Mediterranean races from Mesopotamia to Europe and Africa carrying the civilization developed in Mesopotamia—the pioneers in agriculture and all other cultures of early times in Asia; 4, The movements of the northern "barbarians" from around the Baltic southward, which began with the people who formed the Goths and Vandals and culminated in the Viking raids and colonization of from 800 to 1200 A.D.; 5, The movements in the Pacific of Malays and Polynesians; 6, The movements among the American Indians; 7, The advent of the Eskimos into America; 8, The movements among the later Negroes of Africa.

The First Invasion

The Alpine Race developed in Europe, at first occupied the central part, especially in the lake region of the Alps, and later spread over Russia. In the course of time as they advanced

over the Iranian plateau they domesticated milk-producing animals, made cheese, cultivated grains and fruits such as oranges, grapes, peaches, and figs, painted pottery, and practiced weaving and metal working. Later, the Hittites, whose racial identity is not yet settled, but who were probably of Alpine descent,

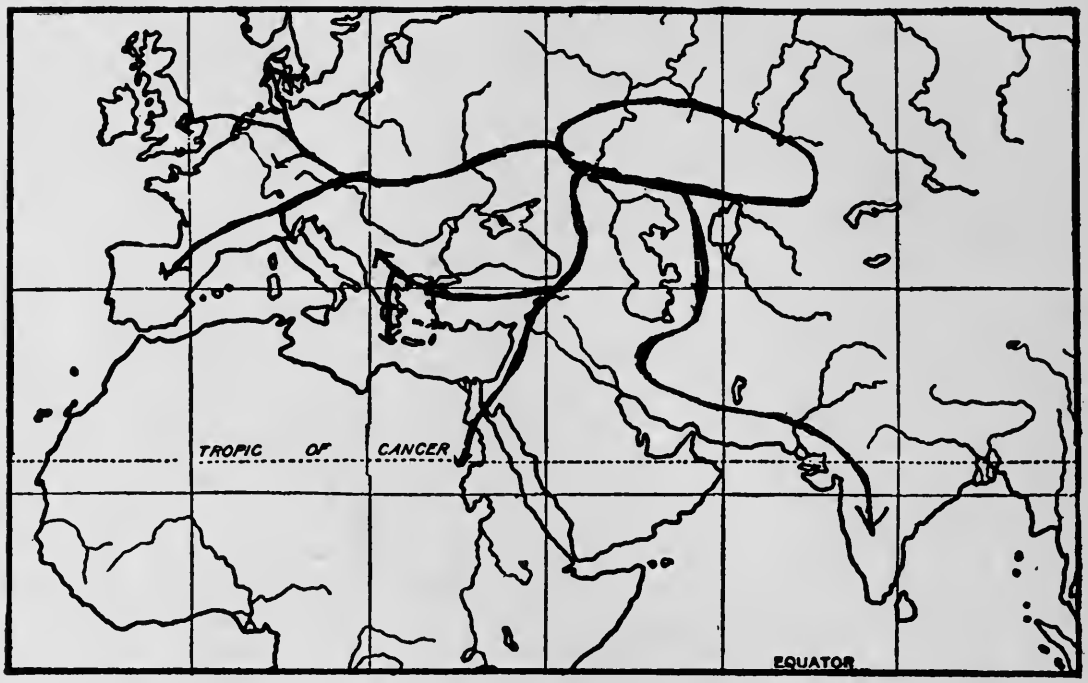

Fig. 42—THE FIRST INVASION

overthrew the dynasty of Hammurabi in Babylonia. They afterward extended their dominions as far as Jerusalem, at the time the Mitanni separated Babylon from Syria, and occupied the country about the tributaries of the Euphrates, although they were dominated by the Horsemen of the Steppes called Kharri, who came by the way of Azerbaijan in Persia.

In the Aegean about 2500 B.C. the Semites, with possibly some Mediterranean and Alpine mixture, produced a strain of restless mariners and business men who, through their search for gold, copper, tin, and precious stones in the mines which they worked, played a large part in the early dissemination of culture from the eastern Mediterranean to western Europe, Great Britain, and the Baltic. Their remains are found close to the sites of former mines for gold, copper, and tin, and are in sarcophagi that are handsomely ornamented, indicating that they were personages of importance. They were no doubt the leaders or directors of the mines and trading posts as well as of maritime

enterprises. Their centers of operation were Crete, the Cyclades, and Hissarlik II. Finally Crete dominated the other two and controlled the trade of the known world of that time.

Parts of Russia and central Europe were overrun by the Alpine Race. They spread over the central part of Europe in solid masses and were never completely driven from their original positions, although partly displaced by the Horsemen of the Steppes (Kelts, or Celts, or Gauls as they are sometimes called) with whom they mixed and whose descendants today form the bulk of the people in Russia and central Europe.

In order to understand the conditions at the time of the movements of the Alpines, and later the Horsemen of the Steppes, into Europe, it may be well briefly to recapitulate the previous movements of man into Europe, and the development of man in Europe. The Neanderthal developed gradually into the Aurignacian, of which we have, as somewhat different forms of the same stock, the Grimaldi, the Brno (or Combe Capelle), and the Cro-Magnon. All three are closely related in physical type, although the Cro-Magnon was much taller than the others. All are long-headed with broad faces and projecting jaws, the Grimaldi more pronounced in the last characteristic than the other two. The Combe Capelle type occupied a large part of western Europe and some of the interior. They later crossed into the British Isles, and their descendants are found today in Wales and west Ireland.* They gradually became transformed until they resembled the Mediterranean Race.

The latest Aurignacians were present in Europe not later than 10,000 B.C.; after them came the Magdelenians, Azilians (a few may have gone into Britain), and about 5000 B.C. the Neolithics. It is as yet uncertain how many or which of these races may have been new immigrants and which of them originated on the spot.

The peoples enumerated above constituted the population of Europe at the time a new people appeared who were fierce and warlike, and who conquered as they moved forward in ever increasing numbers. These tall, long-headed robust people have been called variously Kelts, Celts, Ligurians, Gauls, Centaurs, and other names, but we will call them "Horsemen of the

* H. J. Fleure: *The Races of England and Wales.*

Steppes" because they rode horseback wherever they went. These people moved from the steppes of Russia into Europe during a prolonged period of drought. The first movement passed through the Volga Valley. Some of these fine people reached the Baltic and moved up the Rhine to become overlords in Switzerland, while others entered Hungary through the Moravian gate.

Courtesy of the Metropolitan Museum of Art

Fig. 43—BRONZE SWORD AND SHEATH
Actual length, 20⅞ inches

In central Europe two cultures grew up—a peasantry culture in the Alpine mountains, and the bronze sword culture on the Hungarian plain. The latter was developed by the Horsemen of the Steppes, some of whom passed north into Denmark.

About 1000 B.C. a second movement of the Horsemen of the Steppes came from the east through the Moravian gate armed with iron swords, and spread over the Danube basin. They partly displaced their predecessors of the bronze sword culture.

In the meantime other groups of Iron Sword peoples passed into Italy through the Predil Pass, settled in the Isonzo valley, the Friuli plain, the valley of the Po, and the foothills of the Apennines, with their center at Bologna. Here they established what is known as the Villa Nova culture, which was the same as that which the Dorians brought with them in their invasion of Greece. It was characterized by various kinds of large wide-mouth drinking cups called beakers, which were made of clay, porcelain, silver, and other metals, and by long iron swords. They conquered the Etruscans, those traders who had entered

Tuscany and founded trading cities governed by religious magistrates, and who had carried trading and the search for gold and jewels to nearly all of the known world at that time, especially around the Mediterranean, and through Britain to the uttermost part of west Ireland. Their descendants are still found in mercantile marine and banking enterprises throughout the world.

After occupying Tuscany the Gauls, a mixture of the Alpine Race with the Horsemen of the Steppes, filled the country as far as Pompeii, and later settled in the valley of the Valino. These peoples and their predecessors were fighters and conquered wherever they went. Their advance was not rapid, but by gradual overflow, followed by sudden thrusts, as they increased in number and power. They organized the communities they conquered, and settled down as they advanced until, with the exception of Spain, they controlled almost all the rest of Europe.

The Bronze Sword people conquered central Europe first, but were refugees from the Iron Sword people in Scandinavia and Britain, when the latter drove them from the valley of the Danube, Greece, Italy, north of the Apennines, France (except the Seine valley and Brittany), Belgium, and other regions farther north. The late Bronze Sword people, those big, burly, blond, broad-headed folk, conquered large parts of Britain, drove out some of the previous inhabitants, and introduced their language which is still found among the descendants of those Mediterraneans who were driven into Wales, west Scotland, and west Ireland. The Bronze Sword people adopted the burial customs of the Britons who buried their dead in long, underground passageways called Long Barrows, with niches along the sides, which the former changed to circular passageways, now called Round Barrows. They had previously practiced incineration of their dead.

The examples given by these peoples illustrate the thrust movements of invasion. Many later movements of their descendants took place when the barbaric hordes which caused the downfall of the Roman Empire overran a great part of Europe; these continued up to the time of the Vikings, who were of the same stock. The conquered were more numerous than the conquerors, and although the latter left their impress on the

physique of Europe they have largely disappeared except as blends, mosaics, and mixtures.

The Second Invasion

The movements of the Ural-Altaic, or Finno-Ugrians, have been so obscure, and many of them so recent, that these races

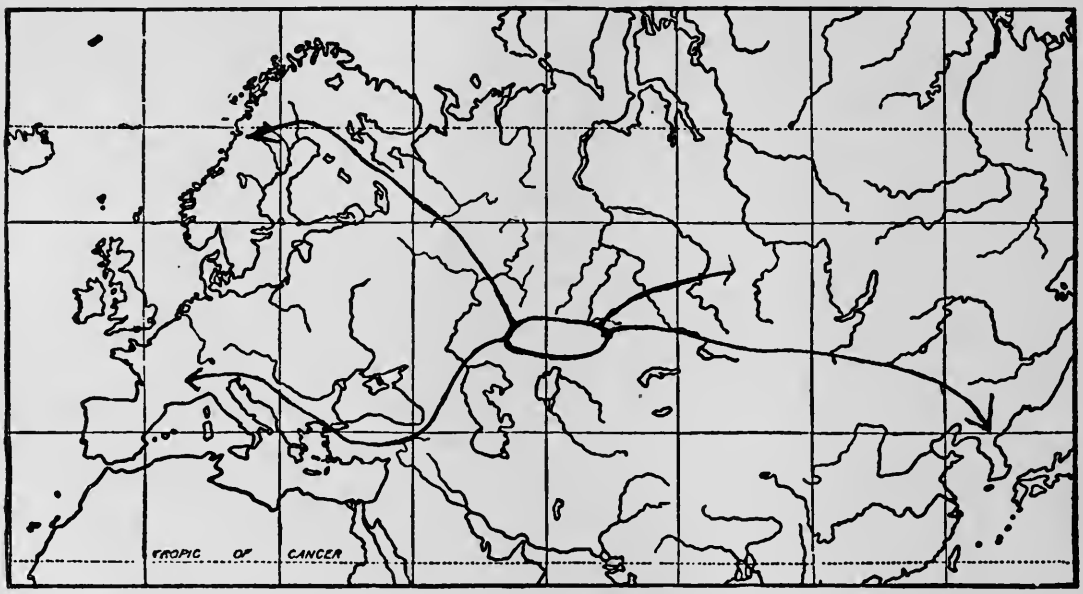

Fig. 44—THE SECOND INVASION

are either unknown or so well known that nothing need be said about their movements. The Turks started in much the same way as the Horsemen of the Steppes, and the first group was composed of about 400 families. They thrust, conquered, and organized, and repeated the process until few of the original families were left, and only the shadow of an organization. They took up Mohammedanism, poured over into Europe, spread over northern Africa and almost controlled the Mediterranean. The victory of John Sobieski at Vienna in 1683 turned the tide of their success and today they are practically out of Europe.

The Third Invasion

The Mediterranean Race originally occupied Sumer, Elam, Syria, Palestine, Egypt, Crete, and parts of Asia Minor, which during the Mesolithic times had been partially occupied by the Semitic Race. About 6000 years ago, or earlier, they started from east of the Mediterranean Sea and spread westward. They distributed themselves over the Aegean at the beginning of the

Neolithic period, and northward into France and thence into England. They also peopled Italy and Spain.

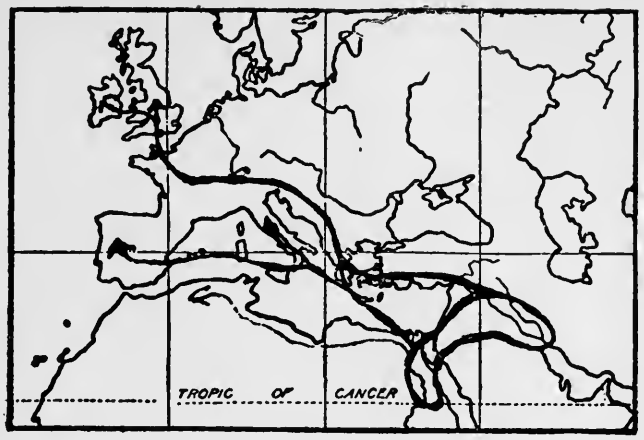

Fig. 45—THE THIRD INVASION

In Greece they occupied the islands and coastal valleys, and the valleys of the southern part of the Balkan peninsula. The whole of southern Italy was occupied by them, as was also the whole of Spain, except the Basque country and the northern interior of Spain, where they mixed with the Kelts to form the Keltiberians.

The Mediterranean Race has been called Iberian in Spain, Ligurian in Italy (although this was also applied to the Gauls), Pelasgian in Greece; and Silurian in Britain. They spread partly over the British Isles and still form a substantial element of the population. They were people of the Long Barrows.

Arabia was the homeland of the Semitic Race, although in south Arabia there is evidence of an ancient Hamitic population which still persists along the south and southwest coasts; as, for example, the Tihama Arabs of the southern Red Sea Littoral, and the Mediterranean-like Arabs of the southwest mountains. The Semitic Race is one of a group that has the Hamitic Race at one extreme and the Mediterranean at the other. Not later than 3000 B.C., as the Akkadians and Canaanites, they passed from Arabia over Sinai and Palestine to Mesopotamia.

The first wave was that of the Akkadians, who overran Syria and Palestine and then passed on to Mesopotamia. They overcame the Sumerians finally and settled in Babylon, between the Mediterranean Sumerians on the south and the Alpine Elamites on the north. A second wave of the Semitic Race spread northward and westward not later than 2500 B.C. These were the people known as the Canaanites; they had relations with the Phoenicians who a little later moved from the Persian Gulf and established themselves on the Syrian coast. A late phase of the same movement of the Semitic Race had some con-

nection with the domination of Lower Egypt by the Hyksos who were forced out of Syria by the Gallic Kassites and Mitanni. The third Semitic invasion, the Aramean, brought north the Hebrew and related peoples, Moab, Edom, and Ammon, who occupied the country as far as the Taurus Mountains. Immediately before the Christian era a fourth invasion brought the Nabataeans and others. This outline is necessarily sketchy and schematic but accords well with the facts.

The Abrahamic family were a tribe of Mesopotamian Semites, probably identical with the Ibri or Habiri of the Egyptians, and similar to the Bedouin, or nomadic, Semites. They entered the land of Goshen during the Hyksos domination and left shortly after the expulsion of their patrons. When they returned to Palestine they met, conquered, and then amalgamated with the Amorites and the Hittites, the former of the Semitic Race and the latter probably of the Alpine. Later the Israelites, now a mixed Semitic and Alpine people, took into their stock the Philistines, a typical Mediterranean Race. The rounded face with a large, prominent nose has ever since that time been a distinctive characteristic of some of the Jews.

The Jews today are divided into two stocks, the Ashkenazic, or northern branch, of Russia, central and western Europe, and England; and the Sephardic, or southern branch, of Arabia, Asia Minor, Egypt, Spain, and Portugal. The latter has been so mixed with the Mediterranean Race that often they cannot now be distinguished. The Jews of the northern group have a fair share of light hair and skin, derived from mixtures with the northern Europeans.

The southern branch of the Semitic Race, largely known as Arabs, was introduced into Egypt about 1000 B.C., or earlier; they were called Sabaeans and Himyarites. In Abyssinia they mixed to form the Amhara and Agau, and later they crossed with the Hamitic Galla to form the Somalis. The Arabs settled largely west of the Nile at a later period and mixed with the Sudanese tribes. The north of Nubia has become Arabized. During historic times the Arabs spread over north Africa and eventually into Spain where they became known as Moors. Jews reached Africa before the Christian era and since then have been pouring in. None of the peoples of Africa, even including the

Fig. 46—A BEDOUIN WEDDING

Mediterranean Race, have modified the original Hamitic Race, or disturbed their ethnic character, except for a narrow fringe along the southern shores of the Mediterranean Sea where the Mediterranean Race is predominant.

The Fourth Invasion

The movement of the "Barbarians of the North" from about the Baltic, including their terminal thrusts in the Viking raids from 800 to 1200 A.D., are so recent and well known that it is needless to discuss them here.

A bare outline of some of their more famous movements will be given. The first nucleus of these people was among the Ger-

mans. It was an amalgamation of a race of peoples in the Neolithic period known as the Megalith builders, and the subsequent amalgamation of these people with the people of the Single Grave or Battle Axe Group who arrived about the end

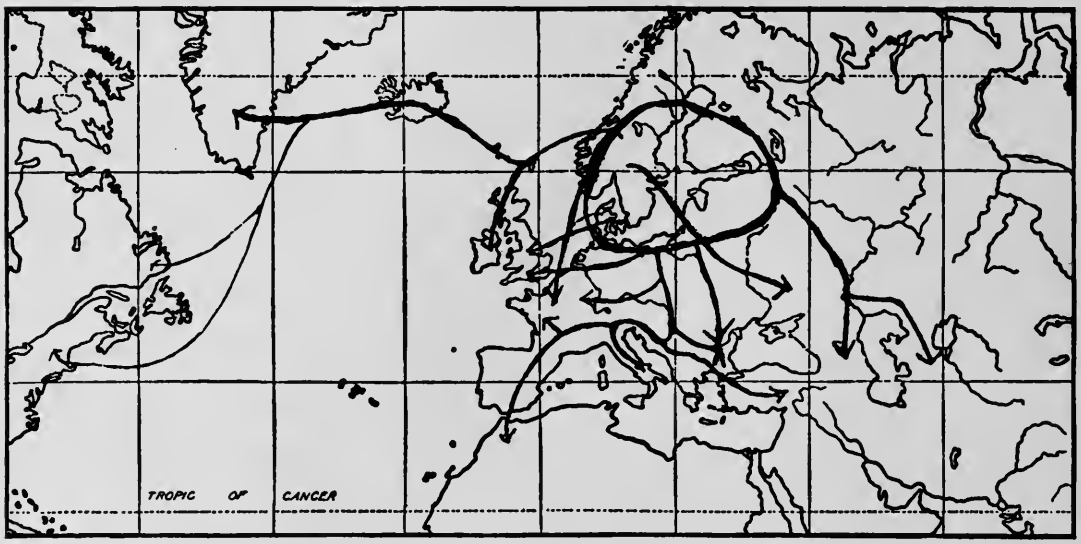

Fig. 47—THE FOURTH INVASION

of the Stone Age. There were three main divisions of Germans in early historic times. There were the North Germans of Scandinavia who later produced the Vikings; there were the East Germans who were an offshoot from the North Germans; and there were the West Germans who about 1000 B.C. pushed westward and southward into the territory of the Celts, Kelts, or Gauls, and about 200 B.C. had advanced the German boundary to the Rhine and Main rivers. They also moved up the Elbe and occupied all of what is now south Germany. These were the Germans who came into contact with the Romans under Caesar and later under Tacitus. They developed the great confederated tribes of the Alemanni, the Saxons, and the Franks.

The East Germans were a branch who about 500 B.C. migrated to the lands between the Oder and the Vistula and pushed down to the Carpathians. Many were migrants from Gottland, an island in the Baltic Sea, the Lombards came from Scania, the southern extremity of Sweden, the Burgundians from Bornholm, an island of Denmark, the Rugians from Rogaland in southwest Norway, and the Goths from Ostergottland and Vastergottland in northern Sweden. These last are the most celebrated. There were also the Vandals, the Gepids, and the Heruls from Den-

mark, south Jutland and Fünen, who followed the Goths to the south, in the direction of the Black Sea. Here in southern Russia lay the new territory of the Goths, and it was here that they divided into the Ostrogoths and Visigoths, and it was from this region that the great Gothic attack, which began about 247 A.D., was launched on the Roman Empire.

The movement of a large section of the Scandinavian peoples across the Baltic Sea in the pre-Roman Iron Age, about 500 B.C., is not an episode in history, but the beginning of the maximum expansion of the Germans—a migration period lasting from about 400 to 800 A.D.—Visigoths, Ostrogoths, and Lombards pressed into Italy; Vandals, Burgundians, Franks, and other Visigoths conquered Gaul; Visigoths and Vandals invaded Spain, the Vandals continuing into Africa; the Alemanni founded a powerful state on the middle Rhine and the Alplands; and the Angles, Saxons, and Jutes invaded Great Britain.

In the meantime the North Germans were rapidly becoming the separate nations that we now know as Sweden, Norway, and Denmark, and long before the West and East Germans were derived from them. The Swedish state was probably the first to form. Thus Sweden can lay claim to being the oldest state in Europe. Pliny, Tacitus, Ptolemy, and Cassiodorus, give us, in the order named, the first historical accounts from the Scandinavians. Much of the history came from the Scandinavian King Rodvulf who attached himself and his followers to the court of Theodoric the Great, where Cassiodorus was a distinguished Roman statesman and a highly honored man. Norway developed as a separate state from Sweden, and afterward groups of these two states conquered the whole territory of what is now Denmark and established themselves there, especially in Jutland.

It is needless to give the history of Scandinavia and of the Vikings. After the establishment of the East Germans and the West Germans, from the three states of Scandinavia, the trade routes to the southeastern Mediterranean on land and the trade routes of the west by sea were controlled by these Germanic or Scandinavian peoples. The Vikings were something more than thieves and destroyers of property; from the earliest times onward they were a folk soberly addressing themselves to the

Fig. 48—ROLLO THE RANGER ATTACKS PARIS
From an engraving after a painting by A. de Neuville

necessary task of winning lands abroad. Between the end of the eighth and the middle of the eleventh century A.D., the three Viking peoples did many brilliant and astonishing things. The Norwegians created and owned towns in Ireland and possessed nearly all of the Scottish islands; they colonized the Faroes, Iceland, and Greenland; and they discovered America. At home they made themselves into a Christian nation united under one

Fig. 49—A VIKING SHIP BEING RECOVERED FROM A BURIAL MOUND

king. The Danes extended their authority over Friesland and won all England for their keeping; like the Norwegians they possessed towns in Ireland and likewise became a single Christian kingdom. In France a rich and pleasant colony was won from the Western Empire by Danish and Norwegian Vikings. In the east the Swedes took large tracts of the East Baltic lands, became the lords of the Dnieper basin, founded the Russian state, ruled the Russian cities, and even dared to assail Constantinople (Stamboul) and to make commercial treaties with the Greek emperors.

The Fifth Invasion

The movements in the Pacific have been of small size and short duration. The first people in the Pacific were the Negritos, and later probably some tall Negroes in the south. The

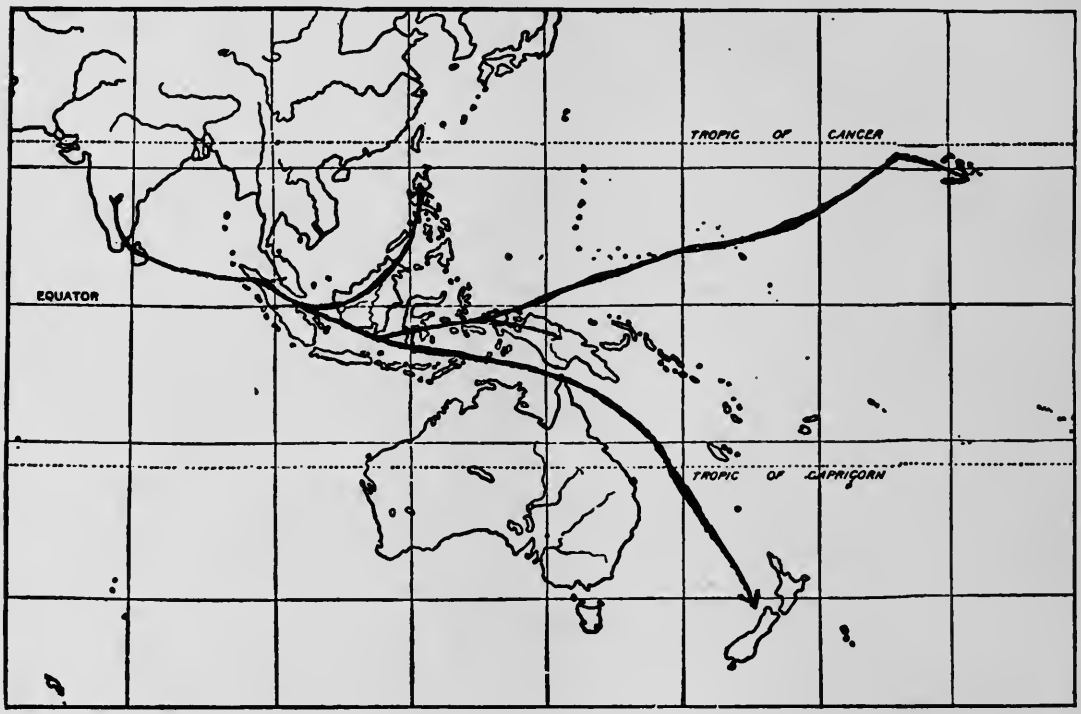

Fig. 50—THE FIFTH INVASION

Pre-Dravidians and Australians may, however, have been there even earlier. The latter settled chiefly in India and Australia, but remnants are still discernible in some of the Pacific islands southeast of Asia and on the south coast of Asia. Then came the Dravidians of the Hamitic Race, who passed through less than 5000 years ago. The Malays of the north had settled in the islands adjacent to the Asiatic mainland as an offshoot of a Yellow-Brown Race similar to the southeastern Asiatics. The Negroes and the Australians had crossed in the south, and some of the Malays had mixed with them to form the Melanesians. The Indian Whites, or Indonesians, mixed with Malays and traces of Negrito forming the Polynesians. This new race drove a broad wedge through the Pacific which has its point in the Hawaiian Islands and its base from Luzon to New Zealand. Some similar stocks also reached to Madagascar. In the heart of some of the large Pacific islands pure Indonesian chieftains may still be found.

Later, some thousand years or more ago, there was a Malay wave, which started in Sumatra and filled the coastal plains of the large islands. The Chinese mixed with them and have carried on the trade of the islands for the last 600 or more years. The latest movement was that of the Mohammedans, chiefly from Arabia, and they had almost completed the conquest of the Philippines when the Spaniards came; since then they have been confined to the Sulu archipelago and Mindanao. There have been smaller movements, but these have been the most important.

The Sixth Invasion

Movements among the American Indians were chiefly a gradual spread from Alaska along the west coast and to the east and southeast, until the whole of the Americas had been peopled by them. The first to come across from Asia were evidently the long-headed Indians represented by the Algonquin, Iroquois, and Shoshonean stocks in North America, by the Piman Aztec tribes farther south, and by many branches in South America extending from Venezuela and Brazil to Tierra del Fuego. The so-called "Lagoa Santa Race" were Indians of this type. Next came the broad-headed Indian of the Toltec type. They settled on the northwest coast, in the Antilles, in Mexico, in Yucatan, in the Gulf States, in Central America, and in Peru and other parts of South America. Still later came the Athapascan

Fig. 51—AMERICAN INDIAN
Wichita

Indians. They found no room in the south and were forced to spread over the cold north. The Athapascans were similar to the other broad-headed stocks which had preceded them.

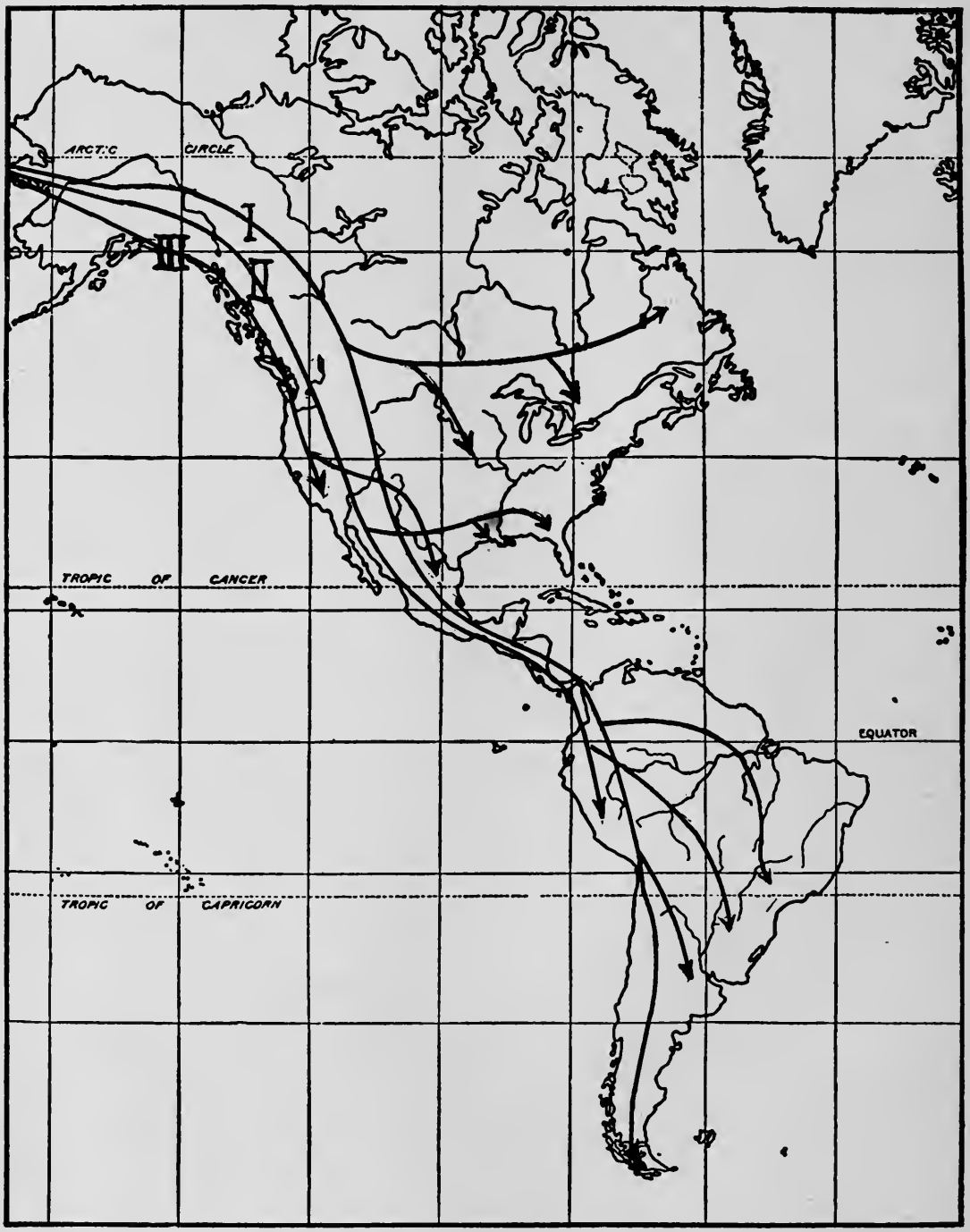

Fig. 52—THE SIXTH INVASION

They settled chiefly in Alaska and northwestern Canada, along the western coast in California where they were known as the Hupa, and in Arizona, New Mexico, Texas, and parts of Mexico where they became known as the Apache.

The Aztec, the Mayan, and probably another branch of the Maya in Peru, the Yunca of the coasts, together with the Aymara, Quichua, Nahua, and others, formed civilizations. Many thrust movements took place, but they were of a minor character and so obscure that it is needless to dwell on them.

Fig. 53—ESKIMO MAN
From Smith Sound

The Seventh Invasion

One of the latest of the invasion movements was that of the Eskimo from their original home in the extreme northeastern corner of Asia and the adjacent shores of Alaska, including some of the intervening Aleutian islands, across the northern part of North America to Greenland, where the latest and most extreme types are to be found with extremely long, narrow, high skulls with keeled domes. Those who are at present found in Asia resemble

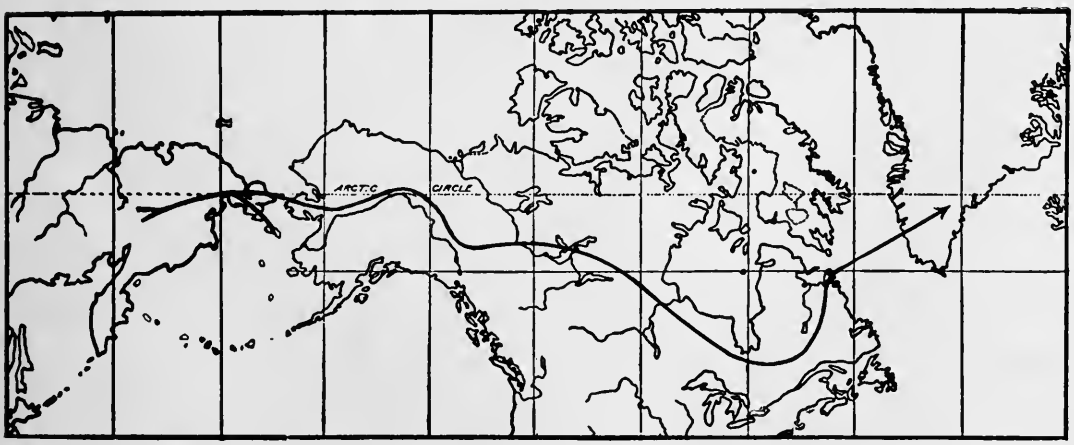

Fig. 54—THE SEVENTH INVASION

the Chukchi * and neighboring tribes, but those in Greenland are somewhat different. The breadth of the nose is greatest in Asia and least along the Arctic coast of North America and in the northeast, including Greenland. The stature is highest along the rivers and parts of the coast of western Alaska, and lowest in Greenland and Labrador. The changes appear to have been gradual and moderate and as a single group. Their nearest basic relatives are the American Indians. The two families, Eskimo and Indian, might be likened to a hand, with the Eskimo as the thumb, a younger, smaller, and still uniform member, the Indians like the fingers, and the original paleo-Asiatic like the hand, the source of both. The later differentiations within the Eskimo group have been in America.

Fig. 55—THE SEVENTH INVASION
Treking from the coast of Alaska

The Eighth Invasion

The most recent movements of the Negroes in Africa have been those of the Bantu † stocks. They moved south into the lower end of Africa and came up the west coast almost to the Congo, leaving the Bushmen and Hottentots in central South Africa. Later they started a backward movement from the southeast which went through central Africa and northwestward to the region of the Niger and the Sudan and Sahara. They conquered as they went, and occupied a great part of Africa, but the central, northern, and northeastern parts did not come under their control. They have not existed as a whole people, but settled as they conquered and left each community as a petty state with absolute sovereignty vested in a native chieftain.

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* A tribe found on the extreme northeastern corner of Asia.

† A negro stock occupying nearly all of Africa south of the Equator, except the territory of the Bushmen and Hottentots.

Migration

The movements of individuals and families formed a part of the spreading movements and also of the migratory movements between the thrusts. The "Flight of a Tartar Tribe" may not have been a migration, nor a simple spread, nor yet a thrust movement. The best example of a migration has been the settlement of the Americas. There have been others, but they have not been of great size or duration, and it would mean little to search out and present the known migrations, the major ones having already been sufficiently given under the other headings of spreading and invasion.

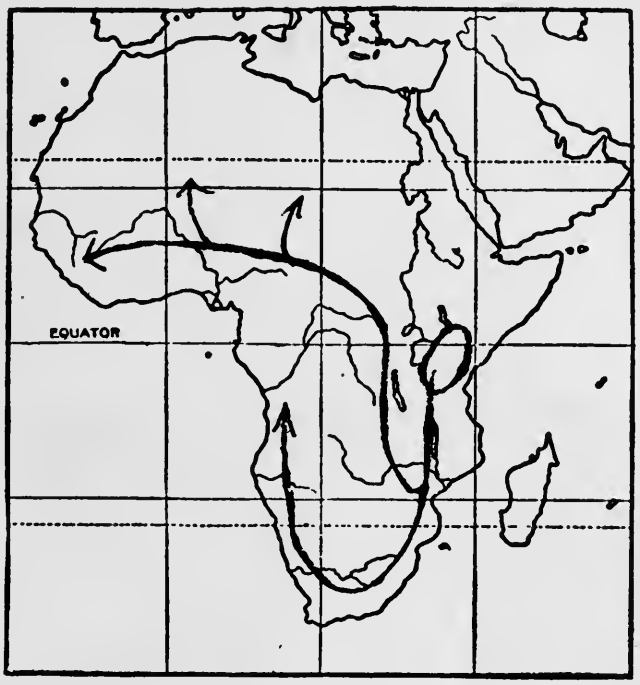

Fig. 56—THE EIGHTH INVASION

The chief migrations came from Europe as the population increased beyond the saturation stage. There were nearly always mixed movements of settlement, of barter, and of warlike invasions.

More recently Britain spread to America, Australia, New Zealand, South Africa, and India. Other nations are in line for compression at home, or depression of the birth rate.

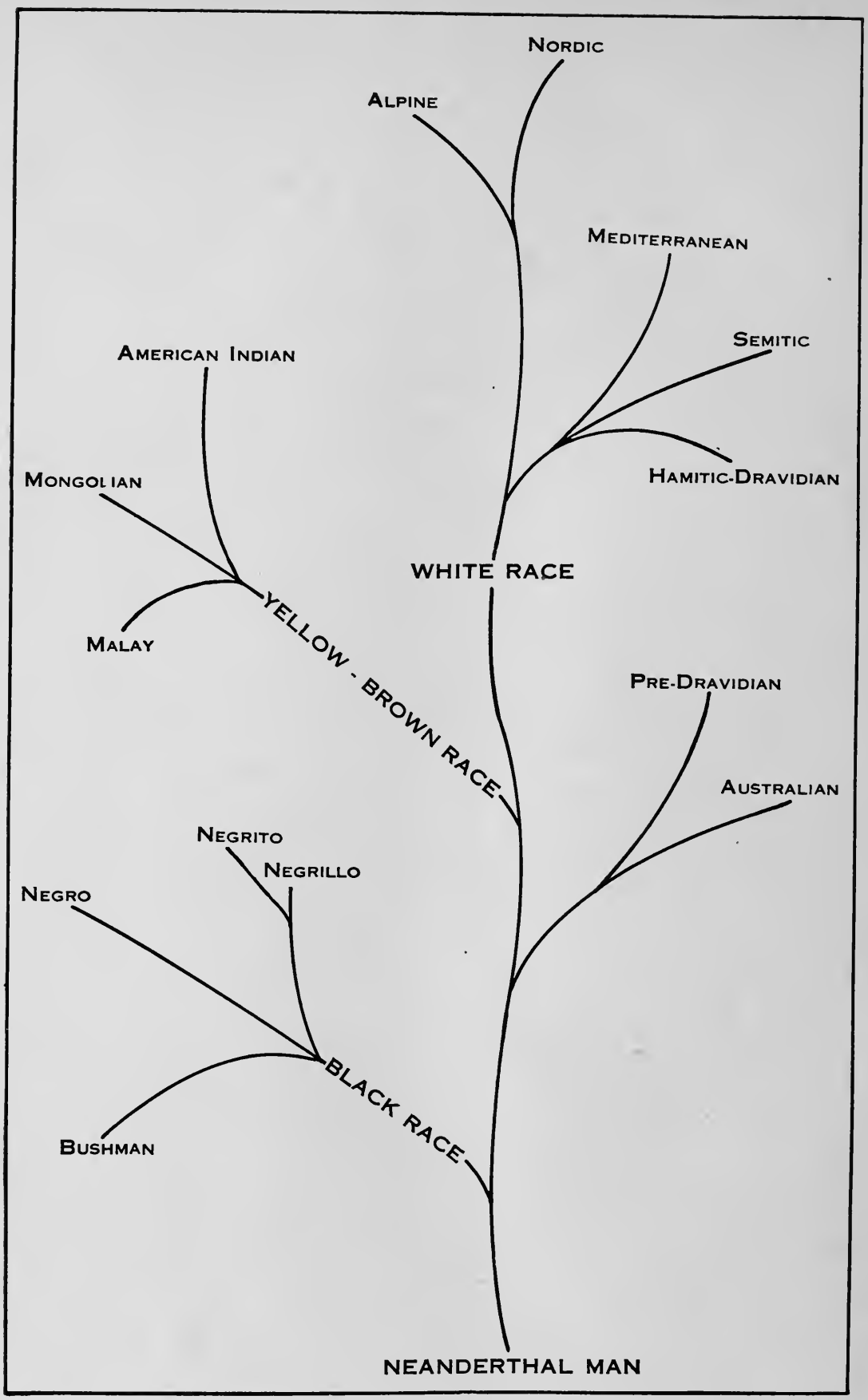

Fig. 57—THE TREE OF RACES

CHAPTER IX

MODERN MAN

THE three main great races of man, the White Race, the Yellow-Brown Race, and the Black Race, occupy the great land masses in the Old World. All three have also moved to the New World, where today they are intermingling and mixing to a greater or lesser degree. All of these as well as other living races originated from the same parental stock, and the evidence points to Europe with the most proximate parts of Asia and Africa as the original home of all three.

The Black and White races are the most divergent, whereas the Yellow-Brown Race is nearer to the White than to the Black. The Black Race in Africa, enervated by the heat of the tropics and handicapped by the dense jungles and by diseases peculiar to these localities, and the White Race, stimulated by the cold of the winters and aided by the healthfulness and fertility of the temperate zone, have developed along quite different lines. The hot, moist climate of the African jungle may have accelerated certain changes in the Black Race, such as increased color or pigmentation, kinky hair, broad nose, and even the head form and facial features, whereas the White and the Yellow-Brown races in the temperate zone did not become so rapidly differentiated from each other. They also retain in individuals various Neanderthaloid characters in more marked conditions than is found among the Blacks. A comparison of some of the most outstanding differences between the three races will be given in this chapter.

Skin Characteristics

The skin color of the White Race is "white," with variations from the almost depigmented, light rosy color of the blonds and reds and the pure white of the untanned Alpine brunette to the more or less tan of some of the Mediterraneans, the brown of

the Arab, and the dark to black of the Hindu and the Abyssinian. The skin color of the Yellow-Brown Race is yellowish brown as the name indicates, but varies in different groups and in various parts of the body under different conditions of clothing and sunlight from yellowish white or tan to leather yellow and all shades of brown. The skin color of the Black Race is essentially black, varying from shades of brown to shiny or sooty black.

The pigments in all the races are the same, but in the skin of the Black there are not only a greater number of granules than in the White and Yellow-Brown races, but the pigment granules are also larger and in more clustered masses. The skin folds or lines of the White Race are finer and closer together than are those of the Black Race. This condition, combined with the thickness of the skin and its inability to radiate or absorb the rays from the sun, gives to the skin of the Black Race that cool, soft, velvety surface which is so pleasant to the touch.

Hair Characteristics

The hair color in the White Race varies from lightest flaxen to golden or red through all shades of brown to jet black; that of the Yellow-Brown varies from jet black to reddish black; whereas that of the Black Race is coal black to grayish black.

The hair on the body in the White Race varies from scant to abundant. The hair of the head is rich, long, of fine texture, straight, wavy, or moderately curly. The cross section is an ellipse. There is much tendency to baldness, particularly in men, and gray hair appears early and tends to become pure white. The beard is fine and long, slightly wavy or loosely curly, and generally grows plentifully on the sides of the face.

The hair on the body of the Yellow-Brown Race is slight or none at all. The hair of the head is long, rich, straight, somewhat coarse or but moderately fine. The cross section is round to somewhat elliptical in contour. There is little tendency to baldness. A late moderate grayness occurs, generally incomplete, and the hair remains yellowish gray. The beard is scant to moderate, straight to slightly wavy, and generally absent on the sides of the face.

The hair on the body of the Black Race is often slight and rarely abundant. The hair of the head is bushy to scant, the

individual hairs medium sized to rather coarse, the form woolly, or kinky, or in thick curls to scattered spirals. The cross section of the Negro hair is elliptical, flattened so as to be almost thick ribbon-like. There is but slight tendency to baldness in old age. Grayness appears late and is generally incomplete. The beard may be fairly well developed but is never as abundant as in many Whites; it has either close or loose curls, and there is a smaller amount on the sides of the face.

The Iris and Pigmentation

The color of the iris in the White Race is pale to deep blue, greenish, gray, and all shades of brown, with the conjunctiva * bluish to pearly white; in the Yellow-Brown Race the iris is medium to dark brown, the conjuctiva blue (in children) to white and yellowish; in the Black Race the iris is dark brown to black, the conjunctiva pale reddish, yellowish, or very light brownish in color.

Differences in Physical Structure

The stature in the White Race is medium to tall, and although there are individual dwarfs there are no groups of pigmies. The legs are medium length to long, and so is the torso or sitting height. The legs are shapely and full, and in women are stout and in apposition (touching) when standing. The hands and feet range in size from small to large and the latter are well arched. The bones of the extremities are medium to long and moderately curved. Exostoses (outgrowths of bone) are common.

The stature in the Yellow-Brown Race is small to medium, seldom tall, occasionally approaching the pigmy. The legs are relatively short to medium, the torso or sitting height, relatively long to medium. The legs are not shapely and calves are often slender in men. The hands and feet are small to medium and the latter have a well developed arch. The bones are more like those of the White Race than those of the Negro. Flattening of the lower leg bones and of the humerus (the bone of the upper part of the arm) is frequent and pronounced, especially in some

* The mucous membrane which lines the inner surface of the eyelids.

of the American Indians. There are fewer exostoses than in the White Race and rickets are unknown.

The stature in the Black Race is very tall to very short, as in the Pigmies. The legs are relatively long and the torso relatively short in the Negroes and the reverse in the Negrillos and Negritos. The legs are moderately to well developed, but not shapely as in the White Race, and in the women they are slightly stout, often lanky, and in the slender not in full apposition or symmetrically opposite when standing. The hands and feet are long in the Negroes but short in the Negrillos and Negritos. The arches are low, which often gives flat feet. The bones of the forearm and lower leg are relatively long in the Negroes but relatively short in the Negrillos and Negritos. The long bones are all remarkably straight without any marked flattening as in the Yellow-Brown Race. The bones are remarkably free from exostoses of any kind, and rickets is rare in the natural environment, but frequent in the temperate zone, possibly because the black skin does not let enough of the ultra rays of the sun through.

Head and Skull

The White Race

The head and skull of the White Race are moderately long to broad, frequently high, large, and in shape variable. The skull bones are thinner than in the Negro. Pathological deformities of the skull are infrequent. The forehead is medium to high and the frontal eminences are double, one on each side, and not central as in the Black Race. The supraorbital ridges (ridges above the orbits of the eyes) are small to quite pronounced, and the glabella, which is the depression between the brow ridges, medium. The depression at the root of the nose may be absent or well defined, broad or deep. The fissures between the eyelids are horizontal and the visible part of the eye is spindle-shaped. The nose often has a prominent bridge and is medium to thin and narrow; the nasal aperture in the skull is slender, its borders sharp. The nasal spine is well developed and long. The nasal index is mostly low or leptorrhine (narrow-nosed). The cheek bones are seldom prominent and are often subdued; there is little or no facial or alveolar projection of the

jaws. The lips are medium to thin, the teeth small to medium. The upper incisors on the lingual side are mildly and uniformly concave from above downward in contradistinction to the

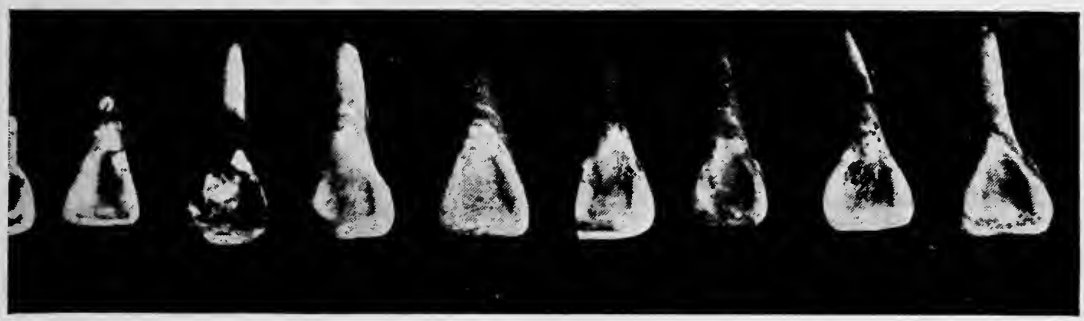

Fig. 58—A SERIES OF UPPER MEDIAN INCISORS OF AMERICAN INDIAN
Showing the shovel-shaped character
From the United States National Museum Collection
Furnished by Dr. Aleš Hrdlicka

shovel-shaped incisors in the Yellow-Brown Race. The chin is more or less prominent, and the jaws small, though large in some individuals. The face as a whole is relatively narrow with slight cheek bones and few or no angles.

The Yellow-Brown Race

The head and skull of the Yellow-Brown Race are medium to broad, low to high, and small to large, with much variation in shape and size, although on the whole slightly smaller than in the White Race. Pathological deformities of the cranium are very rare. The forehead is low to medium, the frontal eminences are generally double but not so well marked as in the White Race; the supraorbital ridges are medium to large, and the glabella is more or less ill developed. The eye fissures are oblique to horizontal; the visible part of the eye ranges from almond shaped to a shape much like that of the White. In some cases, especially in children, the corner of the upper lid next to the nose passes downward over the lower lid and makes the epicanthus or "Mongolian" fold, which causes the eye to appear still more oblique. The nose is long and moderately broad, with mostly a medium nasal index; the root of the nose is broad and shallow, and is in some groups ill defined; the bridge is not as prominent as in the Whites. The cheek bones tend to be prominent or voluminous and the face broad and long, thus making a large face, especially so in the American Indian. The

face is not flat nor does it protrude. The teeth have only moderate projection, and are medium sized to large. The inside of the upper incisors is generally shovel-shaped, which is a distinctive characteristic. In this respect the Yellow-Brown Race resembles the Neanderthal man more than does either the Black Race or the White Race. The lips are not turned out with a large spread of mucous membrane as in the Black Race. The chin is medium sized and the jaws are often large, strong, and well developed.

The Black Race

The head and skull of the Black Race are generally long, narrow and low, rarely broad, and smaller than in the White Race. The forehead is medium and usually has a single frontal protuberance or "lump" in the middle, which is especially marked in children. The supraorbital ridges are slight, the nasion depression deep, the nose low and broad, the nasal index platyrrhine (broad-nosed), and the nasal borders dull and sometimes in the form of gutters. The eyes are rather wide open or bulging, the eye slit mostly horizontal. The cranium has a characteristic shape which varies little in the true Negro. The front part is relatively small and slender, the parietal and occipital regions rather protuberant. The cheek bones are about medium, the face and jaws project forward more than in either Whites or Yellow-Browns, the teeth are large and the upper incisors occasionally shovel-shaped. The lips are thick, excessively so, and the mucous membrane dark and everted to show an extensive area. The chin is small or moderate and the jaws mostly of but medium size. The entire face projects forward, often in marked contrast with the lack of projection in the White and Yellow-Brown races.

The Neck and Body

The neck and body in the White Race are shapely. The breasts are generally hemispherical. The buttocks are shapely, sometimes with a slight over-development of fat (steatopygy). The neck and body of the Yellow-Brown Race are less shapely than in the White Race. The breasts are conical to hemispherical, the waist and hips rather broad. The buttocks are

Courtesy of the American Museum of Natural History

Fig. 59—A NEGRO

seldom large, and the generative organs are moderately developed.

The neck and body of the Black Race are medium sized; the neck is sometimes long, but the body is in excellent proportions, frequently with superb looking musculature. The breasts are conical in shape, and the waist and hips are narrow. The buttocks are shapely, but sometimes have a pronounced steatopygy or a great protrusion backward which forms a shelf.

The Ear

The ear of the Yellow-Brown Race is the largest. It is oval and somewhat flaring, with a lobule that hangs down low. The ear of the White Race, somewhat smaller than that of the former, is relatively narrow and long, and the lobule does not hang so low. The Negro ear is the smallest, and is at times angular in shape with a broad rim above and absence of lobule below; the helix, or incurved rim of the exterior portion of the ear, is quite often irregular in outline.

Mental Characteristics of the Three Races

In general, the brain of the White Race is large, the convolutions are rich, with deep fissures. The mental characteristics are activity, nervous and physical vivacity, strong ambitions and passions, and highly developed idealism. There is love of amusement, sport, exploration, and adventure. Art and music are highly developed in appreciation and skill. Poetry is also cultivated to a great extent. Egoism and individuality are strong, but worries and cares are excessive, and psychoses and other brain affections are not only frequent but are on the increase. The religious life of the Whites is varied and highly developed. Their industry is incessant and elaborate. They are more or less immune to certain diseases that affect the other races, but are subject to others.

The brain of the Yellow-Brown Race is about medium human in size, with medium to good convolutions, which are sometimes varied and deep. The mental characteristics of the Yellow-Browns need further study, but they seem to be less vivacious, with emotions and passions less evident when strong than in the other two races. They possess moderate idealism

and some love of sport, but have less spirit for exploration and adventure than the White Race. They are artistic, but their musical sense is subdued and they have little ability in poetical composition. They are less subject to cares and worries and are less varied and intense in religious feeling than is the White Race and have few psychoses and brain affections. They are industrious, endure fatigue, and are less likely to succumb to many of the infectious diseases than is either the White or the Black Race.

The size of the brain in the Black Race is below the medium both of the Whites and of the Yellow-Browns, frequently with relatively more simple convolutions. The frontal lobes are often low and narrow, the parietal lobes voluminous, the occipital protruding. The psychic activities of the Black Race are a careless, jolly vivacity, emotions and passions of short duration, and a strong and somewhat irrational egoism. Idealism, ambition, and the co-operative faculties are weak. They love amusement and sport, but have little initiative and adventurous spirit. Within limits the Blacks are rather artistic in music, but not intellectually so. They show some ability in pictorial, decorative, and industrial art, but generally lack steady application. They have poetry of a low order, are rather free from lasting worries, are cursed with superstitious fears, and have much emotionalism in religion. They are only moderately affected by psychoses. Their worst diseases come from sexual promiscuity, contact with the White Race, and lack of acclimatization.

Recapitulation

This brief résumé shows that the White Race is intermediate between the other two races in hair form, length of legs, ear form, and facial angle; the Yellow-Brown Race is intermediate in skull and brain size, in brain form, and in the projection of the nose and face; and the Black Race is intermediate in the amount of hair on the body. The Black Race has a greater number of extreme characteristics than either of the other two, and consequently is more fixed (static) in evolution. The alterations that take place during evolution are in separate characteristics and not in an entire individuality. There are extremes of one kind in one race and of another kind in another, therefore

it cannot be said that one race is more advanced in evolution except in relation to individual characteristics. The White Race is more advanced in the evolution of the brain and face and in color, the Yellow-Brown Race in the loss of body hair, and the Black Race in the ear form, hair form, and length of the legs.

The White Race, apparently, has greater immunity to city life and civilization with their diseases and lack of fresh air and sunshine; the Yellow-Brown Race has apparent immunity to certain diseases of the Orient, such as bubonic plague and cholera, and to some parasites; the Black Race has apparent immunity to tropic conditions and to certain diseases incident to tropical climates. If civilization and city life are to be the conditions of the future, the White Race has a survival value not possessed to nearly so great a degree by either of the other races.

CHAPTER X

CLASSIFICATION OF MAN

THE attempts to define race in terms of physical, mental, chemical, and pathologic differences is quite unsatisfactory because all racial characteristics greatly overlap between the groups, and none of the characteristics in any group may be regarded as wholly fixed. There are wide ranges of individual and group variations, and the extremes overlap those of other racial units.

Conditions of indefiniteness, or imperfect stability, and overlapping apply to all characteristics of whatever nature. Nothing is set, nothing immutable, nothing wholly apart from the rest. The conclusion that man is represented today by but one species, and that his subdivisions deserve no further designation than that of races, seems the only justifiable conclusion.

White, Yellow-Brown, and Black, as first designated by Hrdlička constitute the three large divisions in which most of mankind can be included. The remainder are few in number, and are usually mixed, as the Senoi or Sakai of the Malay Peninsula, who are apparently mixed Malays, Pre-Dravidians, and Negritos. There is no satisfactory classification of the types of mankind, and we do not know the causes of race differences nor the extent to which a racial type is fixed. There is much flux to and fro, in the various groups, and the best we can do is to approximate the outstanding characteristics of each group. It is only by dealing with large numbers of individuals and by considering many criteria that we can strike an average which justifies the term race.

Anthropologists and others have made many observations and measurements of peoples all over the world, and it is by means of profound studies of all the accumulated facts that one arrives at conclusions regarding the characteristics of the races and their distribution throughout the world.

The earliest classification of man was by Linnaeus, who placed him among mammals under the order of Primates, as one species *Homo sapiens,* divided into *Europeous, Asiaticus, Asser* (Negro), and *Americanus.* Two other races are mentioned *Homo fesur* (savage) and *Homo monstruosus,* connected with peculiar notions of the past.

Blumenbach next added Malay, which made five races because he left out the savage and monstrous. Later, in 1801, Virey recognized only two races, or "species"; Morton, in 1839, twenty-two; Huxley, in 1870, nineteen; Topinard, in 1885, nineteen; Deniker, in 1901 and 1926, twenty-nine; and Burke, sixty-three. With greater perception, Haddon, in 1925, grouped mankind into three races, according to hair form: The Ulotrichi, or woolly haired (Black), with nine sub-races; the Cymotrichi, or wavy haired (White), with twenty sub-races; and the Leiotrichi, or straight haired (Yellow-Brown), with ten sub-races.

If an intellectual person should try to classify man based on his own observations he would inevitably say in the first place that there are: "White people (Europeans)"; "Yellow-Brown people (Asiatics)"; and "Black people (Africans)."

Further observations would show him that there are three groups of Europeans: dark, rather short people, like the Spaniards or the Italians (Mediterranean Race); people of intermediate stature and complexion, such as we picture the south Germans or native Swiss (Alpine Race); and fair, tall, people, such as the Scandinavians (Nordic Race). There are non-European sub-divisions of the White Race—the Hamitic and the Semitic races. Similarly there are sub-races of the Yellow-Brown and the Black races. These we will now consider in their order.

Sub-Races of the White Races

The Mediterranean Race

The Mediterranean Race is characterized by a white to tawny skin, swarthier than that of the Nordic Race. When not exposed to sunlight of any intensity it may become ivory white with rosy tints in health, but tans readily and it may become of different shades of tan or even brown, as in some Arabs and

Egyptians. The eyes are medium to dark brown. The stature is mostly about the average for men, or near five feet, five inches, and it is about five feet for women, but there are many shorter groups. The stature is remarkably stable under many different conditions in various parts of Europe, Asia, and Africa, and with few exceptions it has changed little from the time of the ancient Egyptian to the time of the modern Englishman.

Fig. 60—AN AMERICAN WOMAN OF THE MEDITERRANEAN RACE

The other physical characteristics are also remarkably though not absolutely stable. The head of the Mediterranean tends to be long and narrow, and the back of the head projects markedly. The hair varies from dark to black, and from straight to loosely curly. The beard is rather plentiful, characteristic, and uniform. The face is oblong, the features rather prominent, and the lower jaw of medium strength. The nose is likely to be straight and not very thin. The mouth is small, with lips well curved, and now and then rather full.

The first highly civilized contingent of this race about which we hear in history is the Sumerian; then follow the Phoenician, the Cretan, the Greek, and the Roman.

The Mediterranean Race today occupies in general the Mediterranean coasts from the Azores and Canaries to about the Levant, parts of India, part of northern and eastern Africa, and parts of western Europe. In Britain they are well represented in south Wales and Cornwall, are scattered generally throughout England and the islands along the west coast of Scotland,

Fig. 61a—REPRESENTATIVE TYPES OF THE WHITE RACE

Fig. 61b—REPRESENTATIVE TYPES OF THE WHITE RACE

and are to be found in the Irish provinces of Connaught and Donegal.

Scattered parts of the Mediterranean Race still remain in the eastern Mediterranean hinterland: the Persians, the Azer-

Fig. 62—ALPINE RACE

baijani of Persia and the Caucasus, the Hajemi of Persia, the Susians, the Samaritans, with other scattered groups. They merge here with the Semites.

The Alpine Race

The Alpine Race has a complexion which is intermediate between dark and fair. The hair is mostly brown, straight to slightly wavy. The beard is ample. The head is generally broad and rather high with but little protruding in the back. The face is somewhat broader than in the Mediterranean, but the features are equally prominent. The nose is of good size and often rather broad. It is especially prominent in what is known as the Dinaric type. The stature is mostly medium with a tendency toward a heavy build.

The Alpine Race, mixed more or less with other groups, forms the predominant part of the peoples of the Russian nation, of central Europe, and of the Balkans. It has left its impress

on the Russian and other Jews, and it has modified more or less all the groups of man around the Mediterranean and the Baltic and in the British Isles.

The Nordic Race

The Nordic Race has a very fair complexion, ruddy rather than ivory white, which does not tan readily. The hair is light in color and texture, and straight to slightly wavy. The beard is long. The head is oblong and high, the face long with prominent features. The nose is long, narrow, high, and prominent. The eyes are blue, the stature tall, and other characteristics remind one occasionally of the Aurignacian people.

The Nordic Race in great purity is confined to the Baltic region, north Germany, and especially to eastern Scandinavia, where it is purest of all. Skeletons similar to those of the Nordic Race are found in the kurgans of Russia and the "row graves" of Germany. The Nordics have mixed with all the peoples of Europe, with some of western Asia, and with some of northern Africa, and their blond characteristics have been partially obscured by crossing with darker races.

The three races just described, the *Mediterranean, Alpine,* and *Nordic,* belong especially to Europe, but the other two subdivisions of the White Race, the Hamitic and the Semitic, are not found in Europe today except in isolated or scattered groups.

The Australian Race

The Pre-Dravidian, or Australian Race, is by origin distantly related to the Whites. Its members are characterized by a dark to almost black complexion. Usually the hair is very curly and "matted," but in those unmixed with Papuan, it is straight or wavy. The hair in some men is plentiful over the entire body, and the beard is heavy and thick. The hair is not kinky or "cork-screw" as in the Negro, but in many who otherwise show Melanesian mixture it is decidedly curly. The head is oblong and in some cases narrow. In the men heavy brow-ridges, resembling more or less those of the Neanderthal, cross the entire base of the forehead. This race often has a low, receding forehead, approaching the Neanderthal type. The individual features of the face, including a broad nose and a moderate to

Fig. 63—AN AUSTRALIAN
An old man of the Arunta tribe

receding chin are also Neanderthal-like. The jaws project forward, the nose has a depressed root though a fairly prominent bridge, and the lower margin of the nasal aperture is nearly smooth or guttered. The eyes are dark and sheltered by the overhanging brows which in general are more marked than in any other living race. The mouth is large with full lips. The stature is sub-medium to medium.

What remains of the Australian Race is found in greatest numbers in northwestern Australia. At one time this race occupied the entire continent. It is, however, gradually diminishing and will doubtless disappear. People of similar physical characteristics and derivation lived in Tasmania, but are now completely extinct. The type, as such, has also disappeared elsewhere in Malaysia and India.

The Australian Race, which sprang from a late Neanderthal or early Aurignacian form, came in all probability from the direction of Asia Minor into India, thence southward and eastward through the Malay Peninsula, which in early times was connected with Sumatra and Java. Celebes, New Guinea, and the neighboring islands were then it seems joined to Australia.

The Australian man shows primitive characteristics rarely found in modern man. In many cases he is extremely hairy, in marked contrast with the Negro, and more like an occasional White.

The Australians of today are greatly mixed, with large con-

sequent differences in color, hair, stature, shape of the head, and other traits. Blood tests still show a greater resemblance to the European than to any other people.

Their nomadic character, lack of agriculture, of houses and clothes, and their failure to form communities show a primitive civilization, yet their totemism,* complex marriage regulations, and material culture are much specialized.

Certain forms of Aurignacian man in Europe, such as Grimaldi at Mentone, the Combe-Capelle in France, and the remarkable collection of skeletons discovered by Maska at Předmost and Brno in Moravia, in many respects resemble the aboriginal Australian. The Předmost skeletons were associated with a large collection of cultural objects somewhat similar to the *churingia* of the Australians.

The modern Australian has been so greatly modified by mixture with other peoples that hardly any pure blooded aboriginal Australians are now living. They are a temperate people, with much endurance and agility. Their skill in the use of the boomerang is marvelous. Their language is elaborate but without any system of writing; with the exception of mathematics they learn rapidly in schools. They represent a retarded development of a small old section of the White Race.

Remnants of this stock apparently may be found in Ceylon among the Veddas, where their hair is long, black, coarse, wavy or slightly curly, the skin dark brown, the stature short, the head long and small, the forehead slightly retreating, brow-ridges more or less prominent, face Australoid, and nose rather broad and short. Some of the jungle tribes of southern India, some people of east Sumatra, and the Toala of the Celebes may originally have been kin to the Australians, and there is a large substratum of the Australoid throughout the Pacific islands.

The Hamitic Race

The physical traits which distinguish the Hamitic Race today are: dark brown to black hair, straight, wavy to moderately

* Totemism is a primitive form of religion and society wherein a *totem,* an object usually representing some animal or plant, is considered as having some intimate relation to a man or group of men and is therefore sacred. A group of persons allied to one particular totem bears the name of that totem. Marriage within the group is strictly forbidden.

curly; reddish brown or darker skin; sub-medium to medium stature; slender build; oblong head; oval, elongated face with not very prominent nose; lips medium; chin fairly prominent; and jaws not projecting.

The Hamites of Egypt and North Africa, and the Dravidians of India were from the same stock that moved from the direction of Asia Minor. They moved with their cattle and their knowledge of agriculture, and as they spread over Egypt and India they introduced their cultures. They may have brought the Capsian culture into Africa and later presented it to the Mediterranean Race who carried it into southwestern Europe. The Hamitic Race penetrated into Africa as far as the Great African Lakes, where they spread and stayed for a great length of time. They reached into Eritrea below Meroë and into Somaliland. The Danakils, the Hamegs, the Somalis, and other numerous tribes are of Hamitic stock with some Negro admixture. Any older stock about the Nile is chiefly Hamitic. In Nubia the stock is Hamitic back to great antiquity. All the early Nilotic peoples and those about the Great African Lakes were Hamitics. The widely-spread keeping of cattle and the refinement of features betoken the influence

Courtesy of Dr. Aleš Hrdlička

Fig. 64—TWO YOUNG NUBIAN MEN OF THE HAMITIC RACE

of the Hamitic Race throughout Africa. They admixed, as later did the Semitics, even among the ancestors of the Bantu tribes.

The Semitic Race

The Semitic Race is characterized by black hair, by dark eyes, by a rather long face, and usually by a convex and prominent nose. The skin is white, but in Africa and Asia may be dusky or even brown among the Arabs, and the hair is mostly wavy to loosely curly. The stature is medium or taller and they are of rather slender build. The most marked characteristics of the northern Semitics are the prominent convex nose, the eyes, and the rather full lips. The southern Semites are chiefly Arabs and resemble the Mediterranean or Hamitic races.

Their present habitat is in north Africa, Arabia, Mesopotamia, Syria, Persia, Asia Minor and parts of the Caucasus; they are also scattered over Europe and America and in the Pacific islands in small numbers. The Jewish branch is scattered over the whole world, though wherever the Jews migrate they grow through admixture to resemble the people among whom they live for a length of time. About five-sixths live in eastern and central Europe and one-sixth in the remainder of the world.

Fig. 65—IGOROTS OF NORTHERN LUZON, P. I.

Modified representatives of the Hamitic Race

The Sub-Races of the Yellow-Brown Race

The Mongolian Race

The Mongolians, as exemplified by the Chinese, are of yellowish to brownish complexion with intense black, quite straight hair, scant beard, and little if any hair on the body. The head is oblong to broad, and the face is rather flat. The nose, low in the upper part, and long, does not project from the face as in the White races, is not flat as in the Negro, and the nostrils are moderately wide. The iris is dark, the eyelids often have the Mongolian fold and there is a general obliquity of the eye slits. The stature ranges from above low to medium.

The American Indian

The American Indian has a short to tall stature, yellowish brown to dark brown skin, long, black, lank, somewhat coarse hair nearly round in section, head broad to narrow, eye dark brown, eye slits straight to moderately oblique, face large, jaws often massive with medium projection, cheek bones prominent, and nose large and straight or aquiline.

The mouth is large, the lips fuller than in the Whites, the chin well developed. The upper incisors are shovel-shaped on the inside, deeply concave, quite different from the Whites. The ears are rather large. The neck is of medium length, and the chest deeper than in the Whites. The hands and feet are of moderate dimensions and the relation of the lower leg to the upper leg and the lower arm to the upper arm length are intermediate between the Whites and Blacks, and fairly constant in both North and South America.

The Malay Race

The Malay for the most part is sub-medium in stature, with black, lank, straight hair; the skin varies from medium brown to yellowish; the head and face are mostly broad, sometimes the jaws project and the cheek bones are large; the nose is short and not prominent with fairly broad nostrils; the eyes are dark brown and often oblique with the Mongolian fold.

Fig. 66—REPRESENTATIVE TYPES OF THE YELLOW-BROWN RACE

Fig. 67—A BAGOBO MAN OF MINDANAO, PHILIPPINE ISLANDS

The Malays are derived chiefly from the more southeastern Asiatics. They have mixed with the Negritos and other races, such as the Australoid, the Polynesian, and the Melanesian.

The Sub-Races of the Black Race

The Negro Race

The Negro is medium to tall in stature; the skin varies from dark brown to black; the hair is black and frizzly or kinky; the head is long; the forehead has a single bulging center; often there is a marked projection of the jaws; the lips are thick and everted; and the nose is broad and flat. There are two main types of Negroes, one is burly with unusually long arms, the other is slender with unusually long legs.

The Negrillo and Negrito Races

The Negrillo has very short, kinky hair, dark rusty brown to black skin, slight hair on the face, short trunk, long neck, oblong to rounded head, short limbs, hands, and feet, a broad and flat face, bulging eyes, upper lip deep and convex, both lips full but not everted, bridge and ridge of nose broad and flat, nostrils very broad. In stature the men are a little over four feet. If we approach the Negrillos from any direction in Africa

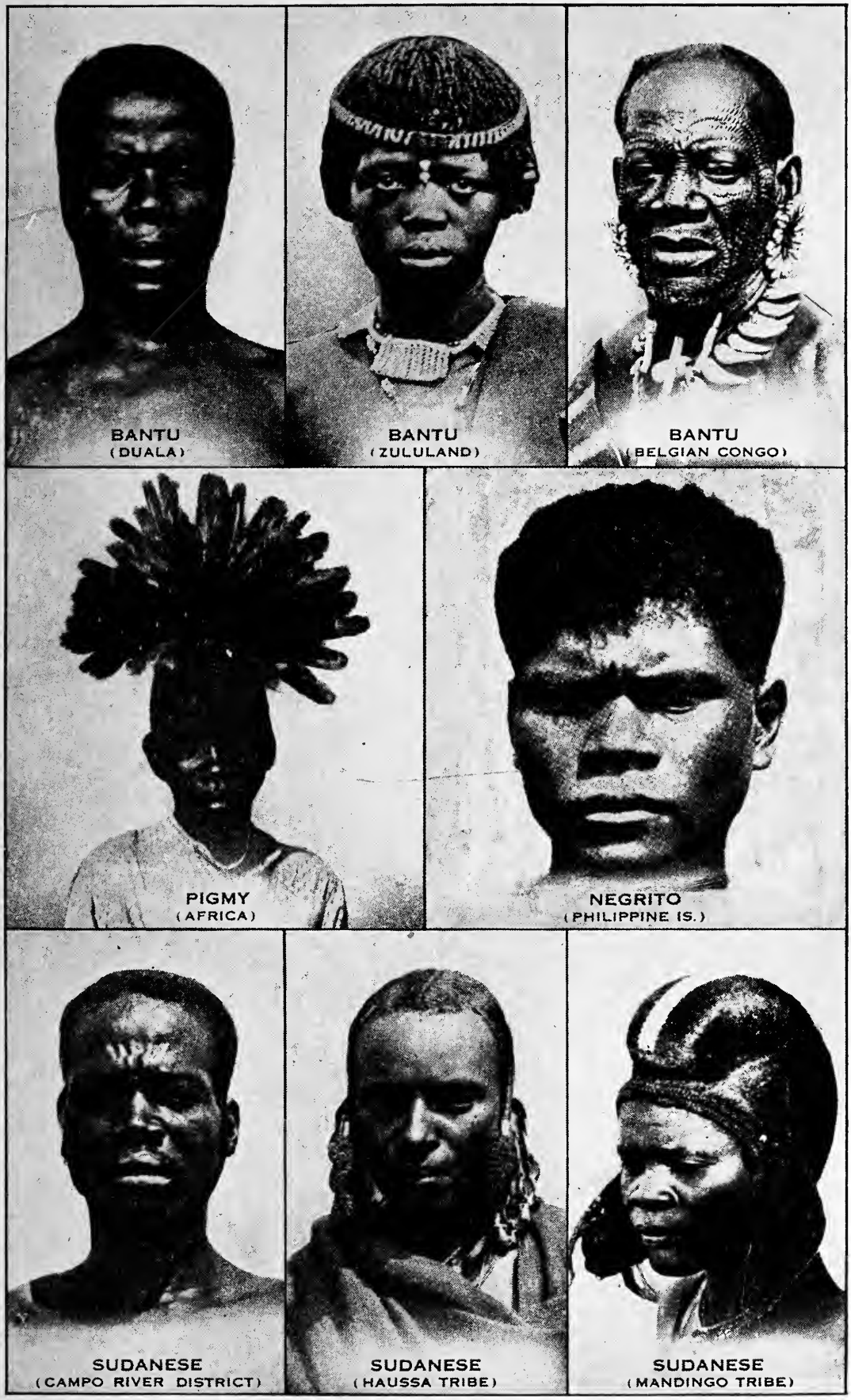

Fig. 68—REPRESENTATIVE TYPES OF THE BLACK RACE

the type changes from the Negroid on the outside through the Negro to the Negrillo, the stature decreases and all the characteristics become altered. The Negrillos represent a modified Negro who is more capable of resisting the hardships under which he labors.

The Negritos are so much like the Negrillos that description is not necessary. There are several types of Negritos, however, some of whom are the result of mixtures with adjacent peoples who have come into the islands.

The Bushmen

The Bushmen have short hair rolled into small spirals leaving bare spaces between, and have but little hair on the body; the skin varies from deeply yellow to dark; the stature is small—about five feet; hands and feet are small; the head is small, low, and not broad, negroid; the face is flattened with relatively prominent cheek bones, bulging forehead, lips rather thick; the nose is very broad and flat; the eyes are often narrow and slightly oblique; frequently there is no lobule to the ear, which may be distorted in outline.

Location of the Mixed Races

The location of the mixed races and the designation of all the mixed groups would be too intricate to justify the time and space. Most mixtures are found in Europe, the eastern Mediterranean area, the Philippines, Oceania, and America. Africa has mixtures of Negroes, Negrillos, Bushmen, Hottentots, Hamites, Semites, and Mediterraneans, especially in the north and east, and in the recent past Europeans have been mixing with the others there. The Pacific islands have mixtures of Negritos, Australoids, Hamites, Mediterraneans, Alpines, Malays, and more recently Chinese and Europeans. The British Isles have the Neanderthaloid, Aurignacian, Hamites, Mediterraneans, Kelts, Alpines, and Nordics. There are semblances of several races in Japan. Almost everywhere in the world today mixtures are going on.

The greatest conglomerate of all is in the United States. Here we have about one-tenth of the population of the Black Race, a large number of Indians, some Chinese and Japanese,

Fig. 69—REPRESENTATIVE TYPES FROM OCEANIA

representations of all the nations of Europe and of some of the Near East. Wherever people have mingled they have mixed ultimately. Such will probably be the result in the United States. The Negro will probably disappear as such by amalgamation. All peoples will mix and blend to produce "nationalities," from which gradually arise new types and further differentiation. The process of "re-creation" is still active. The result will be that those best fitted to survive in various climates and under various conditions of life will still be more or less unlike each other, but all will have closer resemblances than exist throughout the world today. Much will depend upon man's will to discover the facts of human heredity, and his wit to put this knowledge into effect for the elimination of the worst and the retention of the best.

APPENDIX

TABLE I—THE MOVEMENTS OF MAN *

A—Early Culture Periods In Europe

Late Neanderthal	Not later than 18,000 B.C.
Aurignacian	Not later than 14,000 B.C.
Solutrean	Not later than 11,500 B.C.
Magdalenean (Cro-Magnon)	Not later than 9,000 B.C.
Capsian (Mediterranean)	Not later than 5,000 B.C. in Spain. Not later than 3,000 B.C. in Britain.
Neolithic	Not later than 5,000 B.C. in Europe.
Alpine	Not later than 4,000 B.C.
Bronze Age	Not later than 3,000 B.C.
First Dynasty in Egypt	Not later than 2,900 B.C.

B—Horsemen of the Steppes In Europe

Volga Valley	Not later than 2,500 B.C.
Bronze Sword Horsemen	Not later than 2,000 B.C.
Kassites	Not later than 1,675 B.C.
Denmark	Not later than 1,500 B.C.
Greece (Phrygians)	Not later than 1,300 B.C.
Greece (Achaens)	Not later than 1,200 B.C.
France	Not later than 1,200 B.C.
Iron Sword (Thessaly)	Not later than 1,000 B.C.
Dorian invasion	Not later than 1,000 B.C.
Drove out Bronze Sword Horsemen	Not later than 900 B.C.
Villa Nova Culture, Pompeii, Valley of Valino, Predil Pass, Isonzo Valley, Frieli Plain, Valley of Po, Apennines, Bologna	After 900 B.C.

* Dates are approximate.

C—Semitic Race

In Akkad ..... Not later than 3,000 B.C.
In Mesopotamia ..... Not later than 2,500 B.C.
In Canaan ..... Not later than 2,400 B.C.
Joseph in Lower Egypt (Hyksos) ... Not later than 1,675 B.C.
Aramaean invasion ..... Not later than 1,350 B.C.
Arabs in Egypt ..... Not later than 1,000 B.C.
Israelites (Babylonian captivity) .... Not later than 580 B.C.

D—Alpine Race

Alpines started toward Europe or arose in Europe ..... About 6,000 B.C.
Alpine Hamitic Pre-Sumerians .... About 5,000 B.C.
Alpine Hamitic Etruscans (Prospectors) .... About 2,500 B.C.
Alpines spread over Egypt ..... About 2,000 B.C.
Alpines (Hittites) overthrew Hammurabi ... About 1,926 B.C.
Alpines in Armenia? ..... About 1,500 B.C.

E—Mediterranean Race

Capsian Culture into Spain ..... About 5,000 B.C.
Eastern Europe ..... About 5,000 B.C.
Sumerians started civilization ..... About 4,500 B.C.
Flower of Sumerian civilization ..... About 3,500 B.C.
In Egypt? ..... About 3,500 B.C.
As Philistines from Aegean in Canaan ..... About 1,200 B.C.

F—Nordic Race

(See Horsemen of the Steppes)

Spread over Russia ..... 800-400 B.C.
Spread over Europe ..... 400 B.C.-800 A.D.
Spread over north Britain, west France, Iceland, and Greenland, as Vikings ..... 800-1200 A.D.

TABLE II—GEOLOGIC CHRONOLOGY *

Era and Its Duration	Epochs		Dominant Life
Cenozoic 60 million years	Quaternary	Geologic present	Age of Man
		Pleistocene	
	Tertiary	Pliocene	Age of Mammals (First traces of man)
		Miocene	
		Oligocene	
		Eocene	
Mesozoic 140 million years	Cretaceous		Age of Reptiles
	Jurassic		
	Triassic		
Paleozoic 350 million years	Permian		Age of Amphibians
	Carboniferous		
	Devonian		Age of Fishes
	Silurian		
	Ordovician		Age of Invertebrates
	Cambrian		
Proterozoic 650 million years			Primitive life
Archeozoic 800 million years			First traces of life
Azoic 600 million years			Formation stage
Cosmic 400 million years			Gaseous stage

Oldest era at bottom.

* See Note A on page 120.

Time * B.C.	Culture	Race	Climate
0	Iron (La Tène / Hallstatt)	Nordic	Cool Maritime
500			
1,000			
2,000	Bronze	Alpine	Warm Continental
3,000	Carnacian	Alpine	Warm Maritime
4,000	Robenhausen Campignian		
5,000	Maglemosean	Mediterranean	
6,000	Azilian		
7,000			
8,000			
9,000		Cro-Magnon	Sub-Arctic
10,000	Magdalenian		
11,000			
12,000			
13,000	Solutrean	Late Aurignacian (Similar to American Indian) Grimaldi	
14,000			
15,000	Aurignacian	Early Aurignacian (Similar to Australian)	and
16,000			
17,000			
18,000			
19,000			
20,000			Arctic
21,000			
22,000			
Time period indefinite	Mousterian Acheulian Pre-Chellean	Neanderthal	
	Eolithic		

* See Note B on page 120.

Forests	Alpine Glacial Epoch	Stone	Geologic Age
Spruce			
Oak	Daun	Neolithic Stone cyst Dolmen Smooth stone	Recent
Hazel Pine Birch	Gschnitz	Mesolithic Harpoon Javelin	
	Buhl	Frescoes Lateral notched point Laurel leaf point Front-Robert point Art graver Scratcher	
	Zurich		
Dryas	Schlieren	Chipped flints	Quaternary
	Kilwangen	Paleolithic cleaver and scraper	(Pleistocene)
		Indefinite	Tertiary

Note A

The scale in years on the left of the geologic chart is based on the most precise method man has so far discovered for determining geologic ages. Uranium and thorium, for example, disintegrate at a regular rate through successive stages into lead. By this method rocks have been analyzed, and further calculations then made indicate that the earth is 3,000 million years old. Later we may know more exactly its real age.

Note B

The calculations of the geologic ages and the ages of man are somewhat indefinite, and vary from time to time depending upon the method of calculation and the person doing the calculations. We may place the time period from the earliest chipped flints to the present day at somewhere in the neighborhood of 300,000 years in all probability.

SUGGESTIONS FOR FURTHER READING

Prepared by the Author

THE SKELETAL REMAINS OF EARLY MAN—*Aleš Hrdlička* SMITHSONIAN
An exhaustive scientific study of the known sites of early man with their physical character and geographic background.

HUMAN ORIGINS—*George Grant MacCurdy* APPLETON
A scientific study of man's culture in the Old and New Stone Ages and in the Ages of Bronze and Iron.

THE CONQUEST OF CIVILIZATION—*James H. Breasted* HARPER
A voluminous work on the cultures of civilization.

HUMAN BIOLOGY AND RACIAL WELFARE—*Edmund V. Cowdry* and twenty-six other authors; especially THE RACES OF MAN by *Aleš Hrdlička* HOEBER
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A study of the evolution, migration, settlement, and status of the race of man by the Australian geographer and antarctic traveler, especially considering the influence of physical environment.

OUR FACE FROM FISH TO MAN—*William King Gregory* PUTNAM
The evolution of the face, skull, and features of man told largely by pictures.

AN INTRODUCTION TO PHYSICAL ANTHROPOLOGY—*E. P. Stibbe* LONGMANS
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THE BRONZE AGE AND THE CELTIC WORLD—*Harold Peake* BENN
A delightful account of the origin and distribution of the Indo-European Kelts (Celts) from the standpoint largely of archeology.

STUDY OF RACES IN THE ANCIENT NEAR EAST—*William Hoyt Worrell* APPLETON
Discusses the geography, ethnology, and language of the peoples of the ancient Near East, particularly those of Hamitic-Semitic origin.

THE MOST ANCIENT EAST—*V. Gordon Childe* KNOPF
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A study of the distribution of Indians and Indian culture.

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SMITHSONIAN—Smithsonian Institution, Washington, D. C.
YALE—Yale University Press, 143 Elm Street, New Haven, Conn.

GLOSSARY

[Only those terms are defined in this glossary which either are not explained in the text or are explained once and are used again several pages away from the explanation.]

ACHEULIAN: third epoch of the Lower Paleolithic period; named from St. Acheul (Somme), France.

ALPINE RACE: a sub-race of the White Race; it is slightly modified from the Cro-Magnon, the Keltic, and the Nordic races by having a broader head and body proportions.

ARYANS: the people who occupied the Iranian plateau.

AURIGNACIAN: first epoch of the Upper Paleolithic period; named from Aurignac (Haute-Garonne), France.

AURIGNACIAN MAN: resembles the Neanderthal man, but is more modern; the late Aurignacian man was much like the American Indian.

AUSTRALIAN, ABORIGINAL: almost like the Neanderthal man, but slightly more modern.

AUSTRALIAN, MODERN: resembles the Neanderthal man, but is a white man with much hair more or less all over the body.

AZILIAN: the epoch of transition from the Paleolithic period to the Neolithic period; named from Mas d'Azil (Ariège), France.

BANTU: a subdivision of the Negro Race; also a system of African languages.

BINOCULAR VISION: see STEREOSCOPIC IMAGE.

BLEND: a hybrid between two homogeneous races.

BRNO MAN: so named because the skeletons were found in the loess deposits in the region about Brno in Moravia and are preserved in the museum in Brno; this man belonged to Cro-Magnon Race of the Aurignacian epoch.

BRÜNN: German spelling of Brno.

BUSHMAN: a sub-race of the Black Race; about five feet tall, yellow to dark skinned, small hands and feet, very small head, prominent cheek-bones, thick lips, very broad nose. Formerly extended over greater part of South Africa, but now confined almost entirely to the Kalahari desert.

CAMPIGNIAN: final stage of the Mesolithic period; named from Campigny (Seine-Inférieure), France.

CAPSIAN CULTURE: the Upper Paleolithic stone industry of north Africa.

CHELLEAN: the second epoch of the Lower Paleolithic period; named from Chelles (Seine-et-Marne), France.

COMBE-CAPELLE MAN: this skeleton of a tall man was found in 1909 in the rock shelter of Combe-Capelle near Montferraud (Dordogne), France, and is now in the museum in Berlin. He was a Cro-Magnon of the Aurignacian epoch.

CRO-MAGNON MAN: the oldest race of the species to which modern man belongs; so named from Cro-Magnon (Dordogne), France, where the type material was found in 1868; in contrast with the Neanderthal man, Cro-Magnon man was characterized by a prominent chin and forehead, tall stature, and relatively long legs.

DEVONIAN PERIOD: the period of the Paleozoic Era which follows the Silurian; named from Devon, England, where the rocks which characterize the period were first studied.

DRAVIDIAN RACE: the name applied to that division of the Hamitic race which is found in the southern part of India called the Deccan.

FINNO-UGRIAN: see URAL-ALTAIC.

GRIMALDI MAN: belonged to Cro-Magnon Race. Since 1872 the caves of Grimaldi on the Franco-Italian frontier have yielded a number of skeletons; they are of medium stature, with somewhat negroid jaws and a broad, nasal index.

HAMITIC RACE: a sub-race of the White Race; probably the first type of modern white man realized after man began to move away from the Iranian plateau, but it has become modified in modern times.

HOTTENTOT: a mixed race belonging to the Black Race; a cross between the Bushman and the Bantu; found in southwestern Africa.

INDO-ARYANS: a native race of India of Aryan speech and blood.

INDONESIAN: of Hamitic ancestry but modified by mixture with other races in the Pacific.

MAGDALENIAN: the closing epoch of the Upper Paleolithic period; named from the ruins of La Madeleine (Dordogne), France.

MAGLEMOSEAN: the Scandinavian equivalent of Azilian, the epoch of transition from the Paleolithic period to the Neolithic period.

MALAY RACE: a sub-race of the Yellow-Brown Race; derived from the southeastern Asiatic and mixed with the Negrito, the Hamitic-Dravidian, and recently the Chinese.

MEDITERRANEAN RACE: a sub-race of the White Race; similar to the Semitic and Hamitic races, but smaller and slenderer, and with a long, narrow head and face.

MELANESIAN RACE: one of the mixed races; chiefly Negro and Australian mixed with Indonesian.

MICROLITH: diminutive stone tool occurring in various culture levels from the Aurignacian to the Tardenoisian inclusive.

MIOCENE: the third epoch of the Cenozoic era.

MIXTURE: a hybrid between two heterogeneous races.

MOSAIC: a hybrid which exhibits characters of both parents side by side unblended.

MOUSTERIAN: the epoch between the Lower and the Upper Paleolithic periods; named from Le Moustier (Dordogne), France.

NEANDERTHAL MAN: the first manlike form that is truly man. The posture is semi-erect; the head bent slightly down; the forehead low with a heavy roll of bone above deep-set eyes; the nose large and prominent; teeth and jaws heavy; the chin receding; shoulders of great strength; arms powerful; legs rather small.

NEGRILLO: a sub-race of the Black Race; a small infantile-like negro about four feet tall with a round head, a broad, flat face and nose, short limbs, hands, and feet; found in the heart of Africa.

NEGRITO: a sub-race of the Black Race; almost the same as the Negrillo, but found in the islands of the Pacific Ocean near the Asiatic mainland and in out-of-the-way places in the Malay Peninsula and southern India. Included in this sub-race are: the Andamanese of the Andaman Islands, the Semang of the central region of Malay Peninsula and East Sumatra, the Aeta of the Philippine Islands, and the Tapiro of New Guinea.

NEGRO: a sub-race of the Black Race; medium to tall in stature (63 to 70 inches), a marked projection of the jaws, lips thick and everted. Included in this subrace are the Sudanese and the Bantu. The True Negro is found only along the Congo, the west coast adjacent to its mouth, and in the central interior of Africa.

NEOLITHIC: the last period of the Stone Age; the New Stone Age—the period of smooth stone—polished.

NORDIC RACE: characterized by tall stature, blond hair, long heads, rugged frames, and great mental and physical activity.

OLIGOCENE: the second epoch of the Cenozoic era.

PALEOLITHIC: the Old Stone Age, corresponding approximately to the Pleistocene epoch.

PLEISTOCENE: the fifth and latest epoch of the Cenozoic era.

PLIOCENE: the fourth epoch of the Cenozoic era.

POLYNESIAN: one of the mixed races of the Pacific; essentially Hamitic or Indonesian, but mixed with Malay on the north and with Melanesian on the south.

PRE-DRAVIDIAN: the same as the Aboriginal Australian, although modified toward modern man; they occupied India before the Hamitic, or Dravidian, as they are called in India.

PRIMITIVENESS: a primary condition in which not much differentiation or specialization has taken place.

QUATERNARY: the last part of the Cenozoic era; often called the Age of Man.

SEMITIC RACE: a sub-race of the White Race; similar to the Hamitic Race, but in the northern group having more Alpine (broad head and body form with

large prominent nose) and in the southern group more Mediterranean (long head and slender nose).

SPECIALIZATION: an advanced condition in which differentiation has taken place to a greater or less extent.

STEPPE: one of the vast level, and forestless tracts in southeastern Europe and in Asia; some are desert wastes, and others are fertile and capable of high cultivation.

STEREOSCOPIC IMAGE: the blending into one image of two pictures of an object seen from slightly different points of view; the image resulting from binocular vision.

STONE AGE: the first of the three culture ages of prehistoric man; it was characterized by the widespread use of stone implements. It was subdivided into three periods, Paleolithic, Mesolithic, and Neolithic; sometimes divided Old Stone Age and New Stone Age.

TARDENOISIAN: the final stage in the transition from the Paleolithic period to the Neolithic period; named from Fère-en-Tardenois (Aisne), France.

TATAR: see URAL-ALTAIC.

TONUS: the condition of slight but more or less continuous chemical activity in muscles, maintained by constant reflex excitation, controlled through the cerebellum, and leading to the production of heat.

TURKI: see URAL-ALTAIC.

URAL-ALTAIC, FINNO-UGRIAN, TATAR, and TURKI STOCKS: occupy the land between the Whites and the Yellow-Browns, extending from Finland and the Ural Mountains to Korea and Japan; embrace the original Finns, natives of Volga, Huns, possibly Bulgars, Tartars, and various "Turanian" or "Turkic" stocks. They may have included the original Koreans and the early Japanese.

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† For key to pronunciation, see page 134.
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Key to Pronunciation

ā as in dāy	ē as in mēte	ī as in tīme	ŏ as in nŏt
â " " senâte	ê " " êvent	î " " îdea	ô " " lôrd
ă " " ădd	ĕ " " ĕnd	ĭ " " ĭll	
å " " cåre	ē " " tērm	ī " " fīrm	ū " " ūse
			û " " ûnite
ä " " färˈ	ġ = j (gentile)	ō " " ōld	ŭ " " ŭs
à " " làst	g̃ as in get	ô " " ôbey	û " " tûrn

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