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A table of contents for *Bibliotheca Sacra* can be found here:

[https://biblicalstudies.org.uk/articles\\_bib-sacra\\_01.php](https://biblicalstudies.org.uk/articles_bib-sacra_01.php)

## ARTICLE II.

## ORIGIN AND ANTIQUITY OF MAN.

BY WARREN UPHAM, D.SC., ST. PAUL, MINN.

AFTER nearly forty years of special studies of the Ice Age and its glacial and modified drift deposits, which contain here and there on this continent and in Europe the stone implements and the bones of primitive man, Professor Wright has written a new book<sup>1</sup> on the probable place, time, and way of man's creation and early dispersal to all habitable parts of the earth. Be it by the personal design and guidance of a divine Creator, or by natural laws of evolution, in which, as Tennyson wrote,

"Yet I doubt not through the ages one increasing purpose  
runs,"—

in either case we view a very grand scene reaching back to mists and uncertainties of vision in the far distance.

The first three chapters, on "The Methods of Scientific Approach," "The Historical Evidence," and "The Linguistic Argument," pave the way to the more detailed studies set forth in Chapters IV and V, "Origin of the Races of Europe" and "The Origin and Antiquity of the American Indian," and Chapters VI to XI, which give careful consideration to the evidences of man's existence during the Ice Age, with reasons for distrusting his presence in even the

<sup>1</sup> *Origin and Antiquity of Man.* By G. Frederick Wright, D.D., LL.D., F.G.S.A. With Six Maps and Thirty-six Other Illustrations. 12mo. Pp. xxii, 547. Oberlin, Ohio: Bibliotheca Sacra Company. 1912.

closing part of the Tertiary era. These six chapters are successively entitled "Significance of the Glacial Epoch," "Man in the Glacial Epoch," "Man and the Lava Beds of the Pacific Coast," "Remains of Glacial Man in Europe," "Supposed Evidence of Tertiary Man," and "Glacial Man in Central Asia."

The last four chapters relate more specifically to the evolution and antiquity of the human species, namely, "The Physiological Argument," "The Psychological Argument," "The Biblical Scheme," and "Summary and Conclusion."

In an appendix of thirty-two pages are gathered the citations of previous writers, a few additions to the general text, and an outline of recent work of Professor N. H. Winchell, entitled "Implements deemed to be of great age from study of the Patinated Surfaces." An excellent index of nineteen pages completes this very thorough discussion of a most interesting subject, on which, however, much yet needs to be further discovered and more amply debated.

History as known and taught in schools and colleges during the author's boyhood and youth was limited to about three thousand years of ancient Rome and Greece, and to a computed period of nearly six thousand years since the creation of the earth and man at the beginning of the Bible record. More remote history is brought to light by the spade of the archæologist in the Euphrates and Nile valleys, revealing the attainment of much civilization, with highly developed languages, partly preserved by writings and inscriptions, about six to eight thousand years ago.

Of the wonderful progress of man within prehistoric time, probably becoming almost the intellectual equal of the most favored nations to-day, Professor Wright very impressively says:

"At the first dawn of history, and earlier by thousands of years than the classic era of Greece, we find in Crete, Egypt, Babylonia, and Central Asia, military, political, and social organizations worthy of the highest regard and in many respects fit to be an example to all subsequent ages. We shall be fortunate if we succeed in restoring the irrigating systems in operation six thousand or seven thousand years ago in the valleys of the Murgab, the Euphrates, and the Nile. We find in Egypt at that early period a conception of the Deity nobler than that to which Plato and Aristotle attained, an appreciation of the family scarcely less commendable than that of modern times, and in all these centers a progress in the arts only lacking inventions of steam and electricity to make it equal to that of the present time" (pp. 64-65).

Contemporaneous with such very ancient civilization about the eastern Mediterranean and in Mesopotamia and farther east, the great ice-sheets of the Glacial period were melting away from the northern half of North America and from northwestern Europe. By many evidences, as the rate of recession of Niagara Falls, well studied by Wright and Gilbert, the age of St. Anthony Falls, estimated by Winchell to be only about 8,000 years, and the very scanty erosion of rock surfaces exposed to weathering ever since the end of the Ice Age, it is clearly ascertained that these continental ice-sheets were finally melted between 10,000 and 5,000 years ago, with the formation of their grand series of marginal moraines, marking stages of any slight halt or re-advance interrupting the general wane and departure of the ice.

Associated in many places with the late glacial and modified drift, fossil remains of man, or more plentifully his stone implements, are found in both America and Europe, attesting his wide dispersal before the end of this Glacial period. Moreover, it is very interesting to learn that even then the distinct races of man were quite fully developed. This is shown by the skeleton discovered in 1888 at Galley

Hill, England, in Pleistocene high-level river drift of the Thames valley, and by another skeleton found in 1902 deeply entombed in the Missouri valley loess near Lansing, Kansas, the former having a skull "closely related to that of the modern European" (p. 298), while the Lansing skull is "not much different from that of a modern American Indian" (p. 236).

Thus we learn from the physical characters of Late Glacial man in far-separated regions, as likewise from the portrayal of the coeval men of the Nile and the Euphrates, that the great racial distinctions of mankind had been already attained and established nearly as now at almost the remotest time that affords abundant and indisputable proofs of man's existence. Professor Wright argues, indeed, that the entire previous duration of the human species, including the evolution of races and widely diverse languages, with all the progress to the arts and refinement seen at the very dawn of history, may have required no longer time than the subsequent historic period, or perhaps not more than a quarter or even an eighth part of that time. On this branch of his subject he has written as follows, giving a useful challenge that will lead to increased research for new discoveries and convincing arguments by archæologic workers who believe in very long duration of Palæolithic and Eolithic man:

"The civilization of Egypt and Babylonia may possibly have been preceded by many thousand years of uneventful human history, or, on the other hand, if we are left to judge simply from the record of human progress directly within our knowledge, it may have been preceded only by one or two thousand years of man's more primitive state. For it is quite possible, as a simple calculation in geometrical progression will show, for the race, starting from a single pair, to have so multiplied and covered the earth in a thousand years as to furnish all the population of which the written record of Egypt gives any indication in the time of the First Dynasty. There may, indeed, have been many

thousands of years of weary preparation for the incoming civilization of the Pharaohs; but the study of history furnishes us no trustworthy data for such an inference" (pp. 69-70).

Few anthropologists will probably be found ready to agree with this view of the author, in which he assigns only ten to fifteen thousand years as in his opinion the full measure of man's antiquity. For a decision to satisfy all inquirers, we cannot rely on theories of evolution or creation, on which theorists have widely diverse opinions, some holding the origin and development of man to have been exceedingly gradual and slow, others asserting that he probably came into existence as a distinct and enduring species by sudden natural or creative changes, which science has called "sports." Geology, in its records of the Ice Age and of man's relationship to the changes of climate, faunas, and floras, during Tertiary and Quaternary time, must be the arbiter of these questions.

Here the reviewer may be pardoned for referring to his observations in 1897 in the Somme valley of northern France, finding abundant reasons for agreeing with the views of Tylor and Ladrière, cited by Professor Wright in this volume with his approval. From my paper "Primitive Man in the Somme Valley," published in the *American Geologist*, December, 1898, the following personal opinions and conclusions are quoted, noting my belief that men were there, making the stone implements found in the oldest gravel beds with marine shells, before the great uplift there began as an areal part of the continental elevation preceding and causing the Glacial period:

**"The Palæolithic and Glacial periods are shown to have been nearly co-extensive in duration. . . . When the Glacial period was waning, the latest Palæolithic men of western Europe appear to have exterminated most of the species of large mammals . . . through persistently hunting them for food, so**

that at last this people, destitute of metals, but skillful in making implements of stone, bone, and horn, and having even a high artistic taste in carving figures of animals on horn and ivory, became mainly restricted, in providing food, to the sea borders, living in the greatest numbers in Denmark, and subsisting on smaller game, fish, and especially littoral marine mollusks . . . . About the time of the recession of the ice-sheet from the Mecklenburg or Baltic moraines, . . . . another race or group of peoples, more advanced toward civilization, having attained the art of polishing their stone implements, tending herds and practising agriculture in some degree, and bringing with them domestic animals and cultivated plants derived from wild species in the fauna and flora of western central Asia, immigrated and took possession of Europe, supplanting and probably mainly exterminating the old Palæolithic people. This great immigration, ending the Palæolithic and inaugurating the Neolithic period, was probably the dispersal of the Aryans, who, as shown by the researches of philologists, carried throughout Europe languages of close affinity with those which at the same time or partly later spread also through Persia and India.

"The men of the Somme gravel deposits belonged, if I rightly interpret the geologic record, to the early part of the Glacial period, previous to its culmination; the inhabitants of the caverns of Dordogne, in southwestern France, possessing greater skill in the manufacture of flint implements and adding others of bone and horn, hunting herds of wild horses and reindeer, seem correlative with the maximum stage of glaciation, and later these people spread northward, following the retreating ice-sheet to the boundary of its Mecklenburgian stage. De Mortillet and Cartailhac, as archæologists, divide the Palæolithic period of France into four epochs or stages, succeeding one another as follows: 1, Acheullan, named from St. Acheul (or Chellean, from Chelles near Paris); 2, Mousterian, from Le Moustier in Dordogne; 3, Solutrian, from Solutré in Burgundy; and 4, Magdalenian, from the caves of La Madeleine in Dordogne. These time divisions are characterized by increasing variety and excellence of the implements made, and by concomitant changes of the fauna. The implements found in the Somme valley are referable only to the earliest stage, which had at first a mild and moist climate, changing afterward to severe cold, with thick ice on the rivers in winter, broken and floating large blocks of the rock in spring . . . .

". . . The record of the Glacial period here appears, in my view, to be almost wholly represented by deposition of the gravel and sand on the lower flanks of the valley slopes, chiefly adjoining

the mouths of tributaries; and it is in the older of these gravel beds that the flint implements occur, indicating the sojourn of men there at the beginning and through the early part of the Ice Age" (pp. 351-355).

Accepting the estimates and computations of the entire duration of geologic time since the earliest forms of life appeared on the earth, given from geologic, physical, and astronomical researches by Dana, Walcott, George H. Darwin, Tait, Newcomb, Young, and others, as somewhere between ten and a hundred million years, Professor Wright estimates that on a similar ratio the Glacial period, in all its complexity of the accumulation, recessions, readvances, and final departure of the continental ice-sheets, measured perhaps only about 50,000 years, and surely no more than twice that time.

The great antiquity of the Kansan stage of maximum glaciation in the United States, which some glacialists, especially Chamberlin, Salisbury, and Calvin, have regarded as far surpassing the figures just noted, is shown to be subject to a large discount, bringing it probably within 40,000 years ago, or, at the longest, within 75,000 years, by the observations of Professor Edward H. Williams along the border of the Kansan drift. With reference to the prolonged weathering and oxidation of that very old drift sheet, Professor Wright cites the work of Williams as follows:

"Again, the blanket of glacial material covering the attenuated border, though in general highly oxidized, contained wherever examined, and that was in hundreds of places, a small intermixture of rocky fragments which were almost unoxidized, though of a kind to be specially subject to oxidation. Evidently the age of the deposits is determined by this unoxidized material which had been picked up in the movement and brought along with a great mass of material which, as before said, had been already oxidized from the start. Furthermore, Mr. Williams found numerous rounded pebbles which had been oxidized almost to the cen-

ter, but leaving a core of unoxidized material. But some of these pebbles had been glaciated upon one side so as almost to expose the core without disturbing the deep bands of oxidation on the other side, thus demonstrating that the main oxidation of the pebbles had occurred before they were picked up in their original beds in the far north" (pp. 215-216).

Whatever may have been the length of the Glacial period, its closing stage, when its great moraines were amassed, came suddenly and was geologically brief. This was probably due to the depression of the glaciated lands from their great uplift which had caused their cold and snowy climate. By the depression a temperate climate, hot in the summers, was restored along the boundary of the ice-sheets, rapidly melting them away. The Glacial Lake Agassiz, existing while the waning central remnant of our continental ice-sheet was a barrier dam on the basins of Lake Winnipeg and Hudson Bay, could have had a duration of only one or two thousand years, as is known through the amount of work accomplished by its waves and currents in eroding and depositing the gravel and sand of its beaches.

Glacial time, which may be approximately the measure of the age of the human species, is reasonably accepted as less than 100,000 years. The final Wisconsin stage of glaciation, when the moraines were formed and the land uncovered by the ice retreat, is indicated by Lake Agassiz to have been less than 10,000 years; and the Postglacial period, from the Ice Age to the present day, has probably measured only 10,000 to 5,000 years, this period being shortest on the central parts of the glaciated areas.

If an Eolithic period, comprising the dawn of man's use of stone implements, preceded the Palæolithic period and the Ice Age, it may double our estimate of the antiquity of mankind.

Before leaving this part of our subject, the reviewer wishes to note his approval and high appreciation of Professor Wright's view of the stages of recession of the icefields, called interglacial epochs, succeeded by readvance of glaciation. His discussion is so clearly stated, agreeing with my own view for the most remarkable interglacial fossiliferous section known in America, that it is here fully quoted:

"The question of the entire length of the Glacial epoch depends to a considerable extent upon the time which must be allowed for the interglacial epochs. That these were of considerable length appears from the fact that extensive forest beds and stores of peat are found between the deposits of these various stages spoken of and of various minor advances. Doubtless some centuries, and perhaps many centuries, must have elapsed between the recession of the ice during these episodes and its readvancement to cover the accumulations of vegetal material and the eroded surfaces that had been sculptured during the interglacial exposure. Whether these intervals are to be measured by hundreds of years, as in Alaska, or by thousands of years, is not capable in many cases of demonstration. But nowhere does it seem necessary to assume intervals expressed by a higher order of figures, namely tens of thousands.

"The clearest evidence of a prolonged interglacial episode appears in the deposits carefully studied at Toronto by Professor A. P. Coleman. Here on the northern shore of Lake Ontario there are two series of glacial deposits, one overlying the other, separated by interglacial deposits representing both a flora and a fauna containing species that even now do not live in that latitude, but are found no nearer than the Mississippi Valley and the upper portion of the valley of the Ohio. There must therefore have been an interglacial period in the latitude of Toronto long enough and warm enough to permit the migration of shell-fish and of various trees and plants from the Mississippi Valley into Canada, where they had opportunity to flourish for a considerable period.

"When, however, we attempt to estimate this time, we are confronted by various paradoxes of the Glacial epoch. In the first place, it is evident that, for the ice to have melted away as rapidly as it did, an unusually warm climate was necessary. So that it seems likely that extremes of climate met during a considerable time when the summers were very warm and the winters

very cold. This supposition is supported not only from the nature of the case, which requires an excessive amount of warmth to melt the ice back as fast as we have shown that it did in the valley of the Red River of the North, but also by discoveries which Professor Holst, of the Swedish Geological Survey, has made in the glacial deposits near Malmö. Here he has found, mingled in the same lake deposits, species both of plants and of animals which are ordinarily characteristic of widely separated latitudes. But during the close of the Glacial epoch in Southern Sweden there were climatic conditions such that all could flourish in the same locality. While it may not be permitted to suppose that elms, oaks, maples, and pawpaws flourished during an interglacial epoch at Toronto when the edge of the continental ice-sheet was a few miles away, it is not at all beyond the realm of plausible supposition that the ice edge was not more than fifty or one hundred miles away, in which case two or three thousand years may be ample time for both the retreat and the readvance of the ice" (pp. 212-214).

Where was the country or district of man's origin, the Garden of Eden? Professor Wright answers, in an elaborate provisional theory, that it was probably in central Asia, east and somewhat north of the Euphrates.

"A study of the earliest known centers of human development and their relation to the changing conditions which characterized the Post-Pliocene period also leads us . . . to Central and Western Asia as the center where the races of mankind were first developed and from which they have migrated to all parts of the world. It also indicates late Pliocene or early Post-Pliocene times as the period of the earliest development of the species. It is in the valley of the Euphrates and in the southern border of the Aral-Caspian depression that we find the earliest traces of civilization, whose antiquity is reckoned approximately as ten thousand years. At that time cities of considerable importance had arisen in both these centers, a large number of the most useful animals and plants had been domesticated, and most of the important arts necessary for human welfare had been evolved.

"The study of language leads us to the same center of original dispersion. The Aryan tongues, in all probability, originated in the oases which spread out from the base of the mountains which form the southern border of the Aral-Caspian depression. From here, in prehistoric times, Aryan-speaking tribes migrated to Persia and India on the one side, and on the other to Russia and

the rest of Europe. This also seems to have been the center of dispersal for the tribes using the agglutinative forms of speech. For these tongues are still peculiarly characteristic of the region between the Ural and the Altai mountains and very naturally spread to Finland on the one side, and on the other to the shores of America, and to various places in Eastern and Southern Asia.

"From the earliest times there have gone forth from this center migrations of men, marking epochs in the world's history. The conquests of Genghis Khan and Timur the Tartar, and the invasions of Europe by the Turks and the Huns, are more recent examples of these movements" (pp. 351-353).

". . . Central Asia, at the present time, is handicapped by an insufficient rainfall. Over the lower areas only a few inches of rain fall in each year. Besides, the extremes of temperature are almost unbearable. While the thermometer rises on the plains of Turkestan to 130° F. in summer, it descends to the freezing point of mercury in the winter, all due to the dryness of the atmosphere. As it is, the population is compelled to seek shelter in the base of the mountains both from the heat of summer and from the cold of winter. The moist climatic conditions which brought on the Glacial epoch must have spread a most grateful amelioration of both the summer and the winter climate over these now arid regions. In short, it is no unwarranted stretch of the imagination to conceive of this region as the original paradise of the human race" (p. 370).

The lineage of man's ascent, as an animal species, from some ancestral stock whence himself and the apes have diverged, has not yet been traced by geologists. The supposed intermediate species, *Pithecanthropus erectus*, discovered by Dr. Dubois in Java in 1894, is regarded by Wright, following Cope and Lydekker, as "entirely human" (p. 395). We may not answer, therefore, completely and confidently the questions as to when, and where, and how, the Creator "formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul."

Other and subordinate questions, yet of great importance, are well considered in this work, as the lines of origin of the races of Europe, the routes of migrations from the Old

World peopling the New World, and the chronology of the beginning chapters of the Bible.

To us in America the earliest migrations of men to this continent are of very great interest. Professor Wright shows that the American Indians are most nearly allied with Asiatic peoples, and that their routes of coming here were doubtless across Bering strait, also along the chain of the Aleutian islands, and also probably in the course of the ocean currents farther south. Even the past century supplies records of the wrecks of no less than forty-one Japanese ships cast upon the American coast in the vicinity of Puget sound, twenty-nine of these bringing a portion of the crew alive.

The many divergent branches of the American peoples and their remarkable progress toward civilization in Mexico, Central America, and Peru, before the discovery by Columbus, indicate for this division of mankind probably almost as great antiquity as in the eastern hemisphere. Although we are unable to define the date, in thousands of years of antiquity, when the American race came into its heritage, we may paradoxically say that it came here before it had been differentiated from the primordial stock of mankind so as to be racially distinct.

Taken in its orderly arrangement and outlook in many fields, this very interesting and fascinating book is the best on its subject that has yet appeared, being of equal interest to specialists and ordinary readers. It deserves throughout to be carefully studied and pondered by all who believe, with Alexander Pope, that

“The proper study of mankind is man.”