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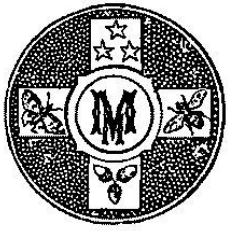
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PREHISTORIC MAN ***

PREHISTORIC MAN





KASKATACHYUH.
A CHIMPSEYAN CHIEF.

Drawn by D. Wilson LL.D. from sketches by Paul Kane.
Cooper & Hodson Lith. 188, Strand, London, W.C.

PREHISTORIC MAN

Researches into the Origin of Civilisation in the Old and the New World.

BY

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IN FOND MEMORIAL

OF A BROTHER'S LIFE-LONG SYMPATHY

IN MANY FAVOURITE RESEARCHES

THESE VOLUMES

DEPRIVED BY DEATH OF THEIR PURPOSED DEDICATION

ARE INSCRIBED WITH THE LOVED NAME OF

GEORGE WILSON, M.D. F.R.S.E.

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PREFACE.

THE subject primarily treated of in the following pages is the man of that new hemisphere which was revealed to Europe in 1492. There through all historic centuries he had lived apart, absolutely uninfluenced by any reflex of the civilisation of the Ancient World; and yet, as it appears, pursuing a course in many respects strikingly analogous to that by means of which the civilisation of Europe originated. The recognition of this is not only of value as an aid to the realisation of the necessary conditions through which man passed in reaching the stage at which he is found at the dawn of history; but it seems to point to the significant conclusion that civilisation is the development of capacities inherent in man.

The term used in the title was first employed, in 1851, in my *Prehistoric Annals of Scotland*, where evidence was adduced in proof of man's presence in Britain "long anterior to the earliest indications of the Aryan nations passing into Europe." It was purposely coined to express the whole period disclosed to us by means of archæological evidence, as distinguished from what is known through written records; and in this sense the term was speedily adopted by the Archæologists of Europe. But the subject thus defined is a comprehensive one; and in its rapid growth, distinctive subdivisions have been introduced which tend to narrow the application of the term. Nevertheless it is still a legitimate definition of man, wherever his history is recoverable solely by means of primitive arts.

The first edition of *Prehistoric Man*, published in 1862, was followed in 1865 by another, carefully revised in accordance with later disclosures. Since then I have availed myself of further opportunities for study and research in reference both to existing

races, and to the arts and monumental remains of extinct nations of the New World. Within the same period important additions have been contributed to our knowledge not only of the arts, but of the physical characteristics of primeval man in Europe. In the present edition, accordingly, much of the original work has been rewritten. Several chapters have been replaced by new matter. Others have been condensed, or recast, with considerable modifications and a new arrangement of the whole.

The illustrations have been correspondingly augmented; and some of them engraved anew from more accurate drawings. In the first edition they numbered seventy-one. They now amount to one hundred and thirty-four, including several for which I am indebted to the courtesy of Mr. John Evans, F.R.S., to the publishers of *Nature*, and to the Council of the Society of Antiquaries of Scotland.

D. W.

University College, Toronto,
18th November 1875.

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CHAPTER I.

INTRODUCTION.

THE INFLUENCE OF THE DISCOVERY OF AMERICA—THE OLD WORLD AND THE NEW—AMERICAN PHASES OF LIFE—THE TERM PREHISTORIC—INFLUENCE OF MIGRATIONS—WHAT IS CIVILISATION?—DOMESTICATION—INDIAN PHILOSOPHY—ABORIGINES—THE TARTAR—THE ARAB—LANGUAGES OF AMERICA—WANDERINGS OF THE NATIONS—FOSSIL MAN—OCCUPATION OF THE NEW WORLD.

The recent development of archæology as a science is due in no slight degree to the simplicity which characterises the prehistoric disclosures of Scandinavia, Ireland, and other regions of Europe lying beyond the range of Greek and Roman influence. But the same element presents itself on a far more comprehensive scale alike in the archæology and the ethnology of the western hemisphere. America may be assumed with little hesitation to have begun its human period subsequent to that of the old world, and to have started later in the race of civilisation. At any rate it admits of no question that its most civilised nations had made a very partial advancement when, in the fifteenth century, they were abruptly brought into contact with the matured civilisation of Europe. Hence the earlier stages of human progress can be tested there freed from many obscuring elements inevitable from the intermingling of essentially diverse phases of civilisation on old historic areas. In the days of Herodotus, Transalpine Europe was a greater mystery to the nations on the shores of the Mediterranean than Central Africa is to us. To the Romans of four centuries later, Britain was still almost another world; and the great northern hive from whence the spoilers of the dismembered empire of the Cæsars were speedily to emerge, was so entirely unknown to them, that, as Dr. Arnold

remarks, “The Roman colonies along the banks of the Rhine and the Danube looked out on the country beyond those rivers as we look up at the stars, and actually see with our eyes a world of which we know nothing.” Nevertheless, the civilisation of the historic centres around the Mediterranean was not without some influence on the germs of modern nations then nursing the hardihood of a vigorous infancy beyond the Danube and the Baltic. The shores of the Atlantic and German oceans, and the islands of the British seas, had long before yielded tribute to the Phœnician mariner; and as the archæologist and the ethnologist pursue their researches, and restore to light memorials of Europe’s early youth, they are startled with affinities to the ancient historic nations, in language, arts, and rites, no less than by the recovered traces of an unfamiliar past.

But it is altogether different with the New World which Columbus revealed. Superficial students of its monuments have indeed misinterpreted characteristics pertaining to the infantile instincts common to human thought, into fancied analogies with the arts of Egypt; and more than one ingenious philosopher has traced out affinities with the mythology and astronomical science of the ancient East; but the western continent still stands a world apart, with a peculiar people, and with languages, arts, and customs essentially its own. To whatever source the American nations may be traced, they had remained shut in for unnumbered centuries by ocean barriers from all the influences of the historic hemisphere. Yet there the first European explorers found man so little dissimilar to all with which they were already familiar, that the name of Indian originated in the belief, retained by the great cosmographer to the last, that the American

continent was no new world, but only the eastern confines of Asia.

Such, then, is a continent where man may be studied under circumstances which seem to furnish the best guarantee of his independent development. No reflex light of Grecian or Roman civilisation has guided him on his way. The great sources of religious and moral suasion which have given form to medieval and modern Europe, and so largely influenced the polity and culture of Asia, and even of Africa, were effectually excluded; and however prolonged the period of occupation of the western hemisphere by its own American nations may have been, man is still seen there in a condition which seems to reproduce some of the most familiar phases ascribed to the infancy of the unhistoric world. The records of its childhood are not obscured, as in Europe, by later chroniclings; where, in every attempt to decipher the traces of an earlier history, we have to spell out a nearly obliterated palimpsest. Amid the simplicity of its palæography, the aphorism, by which alone the Roman could claim to be among the world's ancient races acquires a new force: "antiquitas seculi, juventus mundi."

The discovery of America was itself one of the great events in the most memorable era of the world's progress. It wrought a marvellous change in the ideas and opinions of mankind relative to the planet they occupy, and prepared the way for many subsequent revolutions in thought, as well as in action. The world as the arena of human history was thenceforth divided into the Old and the New. In the one hemisphere tradition and myth reach backward towards a dawn of undefined antiquity; in the other, history has a definite and altogether modern beginning. Nevertheless no great research is needed

to show that it also has been the theatre of human life, and of many revolutions of nations, through centuries reaching back towards an antiquity as vague as that which lies behind Europe's historic dawn; and the study alike of the prehistoric and the unhistoric races of America is replete with promise of novel truths in reference to primeval man. Some of the oldest problems in relation to him find their solution there; and, amid the novel inquiries which now perplex the student of science, answers of unexpected value are rendered from the same source.

The study of man's condition and progress in Europe's prehistoric centuries reveals him as a savage hunter, armed solely with weapons of flint and bone, frequenting the lake and river margins of a continent clothed in primeval forests and haunted by enormous beasts of prey. Displaced by intrusive migrations, this rude pioneer disappears, and his traces are overlaid or erased by the improved arts of his supplanters. The infancy of the historic nations begins. Metallurgy, architecture, science, and letters follow, effacing the faint records of Europe's nomadic pioneers; and the first traces of late intruders acquire so primitive an aspect, that the existence of older European nations than the Celtæ seemed till recently too extravagant an idea for serious consideration.

After devoting considerable research to the recovery of the traces of early arts in Britain, and realising from many primitive disclosures some clear conception of the barbarian of Europe's prehistoric dawn, it has been my fortune to become a settler on the American continent, in the midst of scenes where the primeval forests and their savage occupants are in process of displacement by the arts and races of civilised Europe. Peculiarly favourable opportunities have helped to facilitate the study of this phase of

the New World, thus seen in one of its great transitional eras: with its native tribes, and its European and African colonists in various stages of mutation, consequent on migration, intermixture, or collision. In observing the novel aspects of life resulting from such a condition of things, I have been impressed with the conviction that many of the ethnological phenomena of Europe's prehistoric centuries are here reproduced on the grandest scale. Man is seen subject to influences similar to those which have affected him in all great migrations and collisions of diverse races. Here also is the savage in direct contact with civilisation, and exposed to the same causes by means of which the wild fauna disappear. Some difficult problems of ethnology have been simplified to my own mind; and opinions relative to Europe's prehistoric races, based on inference or induction, have received striking confirmation. Encouraged by this experience, I venture to set forth the results of an inquiry into the essential characteristics of man, based chiefly on a comparison of the theoretical ethnology of primitive Europe, with such disclosures of the New World.

Man may be assumed to be prehistoric wherever his chroniclings of himself are undesigned, and his history is wholly recoverable by induction. The term has, strictly speaking, no chronological significance; but, in its relative application, corresponds to other archæological, in contradistinction to geological, periods. There are modern as well as ancient prehistoric races; and both are available for solving the problem of man's true natural condition. But also the relation of man to external nature as the occupant of specific geographical areas, and subject to certain influences of climate, food, material appliances and conditions of life, involves

conclusions of growing importance, in view of many novel questions to which the enlarged inquiry as to his true place in nature has given rise. If races of men are indigenous to specific areas, and controlled by the same laws which seem to regulate the geographical distribution of the animal kingdom, the results of their infringement of such laws have been subjected to the most comprehensive tests since the discovery of America. The horse transported to the New World roams in magnificent herds over the boundless pampas; and the hog, restored to a state of nature, has exchanged the degradation of the stye for the fierce courage of the wild boar. There also the indigenous man of the prairie and the forest can still be seen unaffected by native or intruded civilisation; while the most civilised races of Europe have been brought into contact with the African savage; and both have been subjected to all the novel influences in which the western continent contrasts no less strikingly with the temperate than with the tropical regions of the eastern hemisphere. The resultant changes have been great, and the scale on which they have been wrought out is so ample as to stamp whatever conclusions can be legitimately deduced from them with the highest interest and value.

The consequences following from changes of area and climate play a remarkable part in the history of man, and have no analogies in the migrations of the lower animals. The Frank, the Anglo-Saxon, and the Norman; the Hungarian, the Saracen, and the Turk: are all to a great extent products of the transplanting of seemingly indigenous races to more favouring localities; but the change to all of them was less than that to which the colonists of the New World have been subjected. There the old process was reversed; and the offspring of Europe’s highest civilisation,

abruptly transferred to the virgin forest and steppes of the American wilderness, was left amid the widening inheritance of new clearings to develop whatever tendencies lay dormant in the artificial European man.

Here then are materials full of promise for the ethnical student:—the Red-Man, indigenous, seemingly aboriginal, and still in what it is customary to call a state of nature; the Negro, with many African attributes uneffaced, systematically precluded until very recent years from the free reception of the civilisation with which he has been brought in contact, but subjected nevertheless to novel influences of climate, food, and all external appliances; the White-Man also undergoing the transforming effects of climate, amid novel social and political institutions; and all three extreme types of variety or race testing, on a sufficiently comprehensive scale, their capacity for a fertile intermingling of blood. The period, moreover, is in some respects favourable for summing up results, as changes are at work which mark the close of a cycle in the novel conditions to which one at least of the intruded races has been subjected for upwards of three centuries.

In Europe we study man only as he has been moulded by a thousand external circumstances. The arts, born at the very dawn of history, give form to its modern social life. The faith and morals nurtured among the hills of Judah, the intellect of Greece, the jurisprudence and military prowess of Rome, and the civil and ecclesiastical institutions of medieval Christendom, have all helped to make of us what we are: till in the European of the nineteenth century it becomes a curious question how much pertains to the man, and how much to that civilisation, of which

he is in part the author and in part the offspring? In vain we strive to detach European man from elements foreign to him, that we may look on him as he is or was by nature; for he only exists for us as the product of all those multifarious elements which have accumulated along the track of countless generations. The very serf of the Russian steppes cannot grow freely, as his nomad brother of Asia does; but must don the unfamiliar fashions of the Frank, as strange to him as the armour of Saul upon the youthful Ephrathite.

Is, then, civilisation natural to man; or is it only a habit or condition artificially superinduced, and as foreign to his nature as the bit and bridle to the horse, or the truck-cart to the wild ass of the desert? Such questions involve the whole ethnological problem reopened by Lamarck, Agassiz, Darwin, Huxley, and others. Whence is man? What are his antecedents? What—within the compass with which alone science deals,—are his future destinies? Does civilisation move only through limited cycles, repeating in new centuries the work of the old; attaining, under some varying phase, to the same maximum of our imperfect humanity, and then, like the wandering comet, returning from the splendour of its perihelion back to night?

Perhaps a question preliminary even to this is: What is civilisation? He who has seen the Euromerican and the Indian side by side can be at no loss as to the difference between civilised and uncivilised man. But is he therefore at liberty to conclude that the element which so markedly distinguishes the White- from the Red- man of the New World is an attribute peculiar to the former, rather than the development of innate powers common to both, and in the possession of which man

differs from all other animals? DOMESTICATION is, for the lower animals, the subjection of them to artificial conditions foreign to their nature, which they could not originate for themselves, and which they neither mature nor perpetuate: but, on the contrary, hasten to throw off so soon as left to their own uncontrolled action. CIVILISATION is for man development. It is self-originated; it matures all the faculties natural to him, and is progressive and seemingly ineradicable. Of both postulates the social life alike of the forest and of the clearings of the New World seems to offer proofs; and to other questions involved in an inquiry into the origin of civilisation and man's relations to it, answers may also be recovered from the same source. There the latest developments of human progress are abruptly brought face to face with the most unprogressive phases of savage nature; and many old problems are being solved anew under novel conditions. The race to which this is chiefly due had been isolated during centuries of preparatory training, and illustrates in some of the sources of its progress the impediments to the civilisation of savage races brought in contact with others at so dissimilar a stage. The very elements for Britain's greatness seem to lie in her slow maturity; in her collision with successive races only a little in advance of herself; in her transition through all the stages from infancy to vigorous manhood. But that done, the Old Englander becomes the New Englander; starts from his matured vantage-ground on a fresh career, and displaces the American Red-man by the American White-Man, the free product of the great past and the great present.

It was with a strange and fascinating pleasure, that, after having striven to resuscitate the races of Britain's prehistoric ages, by means of their buried

arts,[1] I found myself face to face with the aborigines of the New World. Much that had become familiar to me in fancy, as pertaining to a long obliterated past, was here the living present; while around me, in every stage of transition, lay the phases of savage and civilised life: the nature of the forest, the art of the city; the God-made country, the man-made town: each in the very process of change, extinction, and re-creation. Here, then, was a new field for the study of civilisation and all that it involves. The wild beast is in its native state, and hastens, when relieved from artificial constraints, to return to the forest wilds as to its natural condition. The forest-man—is he too in his natural condition? for Europe's sons have, for upwards of three centuries, been levelling his forests, and planting their civilisation on the clearings, yet he accepts not their civilisation as a higher goal for him. He, at least, thinks that the white man and the red are of diverse natures; that the city and the cultivated field are for the one, but the wild forest and the free chase for the other. He does not envy the white man, he only wonders at him as a being of a different nature.

Broken-Arm, the Chief of the Crees, receiving the traveller Paul Kane and his party into his lodge, at their encampment in the valley of the Saskatchewan, told him the following tradition of the tribe. One of the Crees became a Christian. He was a very good man, and did what was right; and when he died he was taken up to the white man's heaven, where everything was very beautiful. All were happy amongst their friends and relatives who had gone before them; but the Indian could not share their joy, for everything was strange to him. He met none of the spirits of his ancestors to welcome him: no hunting nor fishing, nor any of those occupations in

which he was wont to delight. Then the Great Manitou called him, and asked him why he was joyless in His beautiful heaven; and the Indian replied that he sighed for the company of the spirits of his own people. So the Great Manitou told him that he could not send him to the Indian heaven, as he had, whilst on earth, chosen this one; but as he had been a very good man, he would send him back to earth again.

The Indian does not believe in the superiority of the white man. The difference between them is only such as he discerns between the social, constructive beaver, and the solitary, cunning fox. The Great Spirit implanted in each his peculiar faculties; why should the one covet the nature of the other? Hence one element of the unhopeful Indian future. The progress of the white man offers even less incentive to his ambition than the cunning of the fox, or the architectural instincts of the beaver. He, at least, does not overlook, in his sylvan philosophy, that feature in the physical history of mankind, which Agassiz complained of having been neglected: viz., the natural relations between different types of man and the animals and plants inhabiting the same regions. Yet the Indian of the American wilds is no more primeval than his forests. Beneath the roots of their oldest giants lie memorials of an older native civilisation; and the American ethnologist and naturalist, while satisfying themselves of the persistency of a common type, and of specific ethnical characteristics prevailing throughout all the widely-scattered tribes of the American continent,[2] have been studying only the temporary supplanters of nations strange to us as the extinct life of older geological periods.

In that old East, to which science still turns when

searching for the cradle-land of the human family, vast areas exist, the characteristics of which seem to stamp with unprogressive endurance the inheritors of the soil. Along the shores of the Indian Ocean and the Levant, and stretching from the Persian Gulf into the fertile valleys of the Euphrates and the Tigris, are still found seats of civilisation coexistent with the earliest dawn of man's history. But beyond these lies the elevated table-land of Central Asia, stretching away northward, and pouring its waters into inland seas, or directing their uncivilising courses into the frozen waters of the Arctic circle. Abrupt mountain-chains subdivide this elevated plateau into regions which have been for unrecorded ages the hives of pastoral tribes, unaffected by any intrusion of civilising arts or settled social habits; until, impelled by unknown causes, they have poured southward over the seats of primitive Asiatic civilisation, or westward into the younger continent of Europe.

From the wandering hordes of the great Asiatic steppes have come the Huns, the Magyars, and the Turks, as well as a considerable portion of the Bulgarians of modern Europe; while the sterile peninsula of Arabia has given birth to moral revolutions of the most enduring influence. Yet the capacity for civilisation of the Magyar or the Turk, transferred to new physical conditions, and subjected to higher moral and intellectual influences; or the wondrous intellectual vigour of the Arab of Bagdad or Cordova: affords no scale by which to gauge the immobility of the Tartar on his native steppe, or the Arab in his desert wilderness. Without agriculture or any idea of property in land, destitute of the very rudiments of architecture, knowing no written law, or any form of government save the patriarchal expansion to the tribe of the primitive family ties: we

can discern no change in the wild nomad, though we trace him back for three thousand years. Migratory offshoots of the hordes of Central Asia, and of the wanderers of the Arabian desert, have gone forth to prove the capacity for progress of the least progressive races; but the great body tarries still in the wilderness and on the steppe, to prove what an enduring capacity man also has to live as one of the wild fauna of the waste.

The Indians of the New World, whencesoever they derived their origin, present to us just such a type of unprogressive life as the nomads of the Asiatic steppe. The Red-Man of the North-West exhibits no change from his precursors of the fifteenth century; and for aught that appears in him of a capacity for development, the forests of the American continent may have sheltered hunting and warring tribes of Indians, just as they have sheltered and pastured its wild herds of buffaloes, for countless centuries since the continent rose from its ocean-bed. That he is no recent intruder is indisputably proved alike by physical and intellectual evidence. On any theory of human origin, the blended gradations of America's widely diversified indigenous races, demand a lengthened period for their development; and equally, on any theory of the origin of languages, must time be prolonged to admit of the multiplication of mutually unintelligible dialects and tongues in the New World. It is estimated that there are nearly six hundred languages, and dialects matured into independent tongues, in Europe. The known origin and growth of some of these may supply a standard whereby to gauge the time indicated by such a multiplication of tongues. But the languages of the American continents have been estimated to exceed twelve hundred and sixty,

including agglutinate languages of peculiarly elaborate structure, and inflectional forms of complex development. Of the grammar of the Lenni-Lenapé Indians, Duponceau remarks: “It exhibits a language entirely the work of the children of nature, unaided by our arts and sciences, and, what is most remarkable, ignorant of the art of writing. Its forms are rich, regular, and methodical, closely following the analogy of the ideas which they are intended to express; compounded, but not confused; occasionally elliptical in their mode of expression, but not more so than the languages of Europe, and much less so than those of a large group of nations on the eastern coast of Asia. The terminations of their verbs, expressive of number, person, time, and other modifications of action and passion, while they are richer in their extension than those of the Latin and Greek, which we call emphatically the *learned* languages, appear to have been formed on a similar but enlarged model, without other aid than that which was afforded by nature operating upon the intellectual faculties of man.”[3] At the same time it is no less important to note the limited range of vocabulary in many of the American languages. Those characteristics, taken along with their peculiar holophrastic power of inflecting complex word-sentences, and expressing by their means delicate shades of meaning, exhibit the phenomena of human speech in some of their most remarkable phases. But the range of the vocabularies furnishes a true gauge of the intellectual development of the Indian: incapable of abstract idealism, realising few generic relations, and multiplying words by comparisons and descriptive compounds.

To whatever cause we attribute such phenomena, much is gained by being able to study them apart

from the complex derivative elements which trammel the study of European philology. Assuming for our present argument the unity of the human race, not in the ambiguous sense of a common typical structure, but literally, as descendants of one stock: in the primitive scattering of infant nations, the Mongol and the American went eastward, while the Indo-European began his still uncompleted wanderings towards the far west. The Mongol and the Indo-European have repeatedly met and mingled. They now share, unequally, the Indian peninsula and the continent of Europe. But the American and the Indo-European only met after an interval measurable by thousands of years, coming from opposite directions, and having made the circuit of the globe.

The Red-Man, it thus appears, is among the ancients of the earth. How old he may be it is impossible to determine; but with one American school of ethnologists, no historical antiquity is sufficient for him. The earliest contributions of the New World to the geological traces of man were little less startling, when first brought to light, than any that the European drift has since revealed. The island of Guadaloupe, one of the lesser Antilles, discovered by Columbus in 1493, furnished the first examples of fossil man, and of works of art imbedded in the solid rock. They seemed to the wondering naturalist to upset all preconceived ideas of the origin of the human race. But more careful investigation proved the rock to be a concretionary limestone formed from the detritus of corals and shells. The skeletons are probably by no means ancient, even according to the reckoning of American history; though supplying a curious link in the palæontological treasures both of the British Museum and the Jardin des Plantes. Dr. Lund, the Danish naturalist, has described human

bones, bearing, as he believed, marks of geological antiquity, found along with those of many extinct mammals, in the calcareous caves of Brazil. Fossil human remains have also been recovered from a calcareous conglomerate of the coral reefs of Florida, estimated by Professor Agassiz to be not less than 10,000 years old;[4] and the Academy of Natural Sciences of Philadelphia treasures the *os innominatum* of a human skeleton, a fragment of disputed antiquity, dug up near Natchez, on the Mississippi, beneath the bones of the megalonyx.[5]

From those, and other discoveries of a like kind, this at least becomes apparent, that in the New World, as in the Old, the closing epoch of geology must be turned to for the initial chapters of archæology and ethnology. According to geological reckoning, much of the American continent has but recently emerged from the ocean. Among the organic remains of Canadian post-tertiary deposits are found the *Phoca*, *Balœna*, and other existing marine mammals and fishes along with the *Elephas primigenius*, the *Mastodon Ohioticus*, and other long-extinct species. Looking on the human skeletons of the Guadaloupe limestone in the Museums of London and Paris,—the first examples of the bones of man in a fossil state,—the gradation in form between him and other animals presents no very important contrast to the uninstructed eye. Modern though those rock-imbedded skeletons are, they accord with older traces of human remains mingling with those of extinct mammals, to which more recent speculations have given so novel an interest in relation to the question of the antiquity of man. The origin and duration of the American type still remain in obscurity. Man entered on the occupation of the New World in centuries which there, as elsewhere,

stretch backward as we strive to explore them. His early history is lost, for it is not yet four centuries since its discovery; and he still survives there, as he then did, a being apart from all that specially distinguishes either the cultivated or the uncultured man of Europe. His continent, too, has become the stage whereon are being tested great problems in social science, in politics, and in ethnology. There the civilised man and the savage have been brought face to face to determine anew how far God "giveth to all life, and breath, and all things; and hath made of one blood all nations of men to dwell on all the face of the earth; and hath determined the times before appointed, and the bounds of their habitation." There, too, the Black man and the Red, whose destinies seemed to separate them wide as the world's hemispheres, have been brought together to try whether the African is more enduring than the indigenous American on his own soil; to try for us, also, as could no otherwise be tried, questions of amalgamation and hybridity, of development and perpetuity of varieties, of a dominant, a savage, and a servile race. In all ways: in its recoverable past, in its comprehensible present, in its conceivable future, the New World invites our study, with the promise of disclosures replete with interest in their bearing on secrets of the elder world.

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[1] Vide *Prehistoric Annals of Scotland*.

[2] Morton: *Crania Americana*; Nott: *Indigenous Races*, etc.

[3] *American Philosophical Transactions*, N. S. vol. iii. p. 248.

[4] *Types of Mankind.* P. 352.

[5] *Proceed. Acad. Nat. Sc. Philad.* Oct. 1846. P. 107.

CHAPTER II.

THE PRIMEVAL TRANSITION.

THE LATEST MIGRATIONS—FOUNDING A CAPITAL—BEGINNINGS OF HISTORY—PREHISTORIC PHASES—NON-METALLURGIC ERAS—OSCILLATIONS OF THE LAND—THE GLACIAL PERIOD—FOSSIL MAMMALIA—THE FLINT-FOLK OF THE DRIFT—ADVENT OF EUROPEAN MAN—THE DRIFT IMPLEMENTS—CHRONOLOGY OF THE FRENCH DRIFT—SCOTTISH ALLUVIUM—PRECELTIC RACES—THEIR IMITATIVE ARTS—MAN PRIMEVAL—HIS INTELLECTUAL CONDITION—INSTINCT—ACCUMULATED KNOWLEDGE—PRIMEVAL BRITAIN—ITS FOSSIL FAUNA—OSSIFEROUS CAVES—BRIXHAM CAVE—SCOTTISH REINDEER—AMERICAN DRIFT—RELICS OF ANCIENT LIFE—EXTINCT FAUNA—MAN AND THE MASTODON—INDIAN TRADITIONS—GIANTS—DRIFT DISCLOSURES—AMERICAN CRANIAL TYPE—ANTIQUITY OF THE AMERICAN MAN—PRIMITIVE ARTS.

The striking contrasts which the New World presents, in nearly every respect, to the Old, are full of significance in relation to the origin of civilisation, and its influence on the progress of man. Viewed merely as the latest scene of migration of European races on a great scale, America has much to disclose in illustration of primitive history. There we see the land cleared of its virgin forest, the soil prepared for its first tillage, the site of the future city chosen, and the birth of the world's historic capitals epitomised in those of the youngest American commonwealths. Taking our stand on one of the newest of these civic sites, let us trace the brief history of the political and

commercial capital of Upper Canada.

Built along the margin of a bay, enclosed by a peninsular spit of land running out from the north shore of Lake Ontario, the city of Toronto rests on a drift formation of sand and clay, only disturbed in its nearly level uniformity by the rain-gullies and ravines which mark the courses of the rivulets that drain its surface. This the original projectors of the city mapped off into parallelograms, by streets uniformly intersecting each other at right angles; and in carrying out their plan, every ravine and undulation is smoothed and levelled, as with the indiscriminating precision of the mower's scythe. The country rises to the north for about twenty miles, by a gradual slope to the water-shed between Ontario and Lake Simcoe, and then descends to the level of the northern lake and the old hunting-grounds of the Hurons. It is a nearly unvarying expanse of partially cleared forest: a blank, with its Indian traditions effaced, its colonial traditions uncreated. The cities of the old world have their mythic founders and quaint legends still commemorated in heraldic blazonry. But there is no mystery about the beginnings of Toronto. Upper Canada was erected into a distinct province in 1791, only eight years after France finally renounced all claim on the province of Quebec; and a few months thereafter General Simcoe, the first governor of the new province, arrived at the old French fort, at the mouth of the Niagara river, and in May 1793 selected the Bay of Toronto as the site of the future capital. The chosen spot presented a dreary aspect of swamp and uncleared pine forest; but amid these his sagacious eye saw in anticipation the city rise, which already numbers upwards of 60,000 inhabitants; and rejecting the old Indian name, since restored, he

gave to his embryo capital that of York. Colonel Bouchette, Surveyor-General of Lower Canada, was selected to lay out the projected city and harbour; and he thus describes the locality as it then existed: "I still distinctly recollect the untamed aspect which the country exhibited when first I entered the beautiful basin. Dense and trackless forests lined the margin of the lake, and reflected their inverted images in its glassy surface. The wandering savage had constructed his ephemeral habitation beneath their luxuriant foliage, the group then consisting of two families of Mississagas; and the bay and neighbouring marshes were the hitherto uninvaded haunts of immense coveys of wild-fowl; indeed, they were so abundant as in some measure to annoy us during the night."[6]

The vicissitudes attending the progress of the Canadian city have been minutely chronicled by local historians, who record how many dwellings of round logs, squared timber, or more ambitious frame-houses exceeding a single story, were in existence at various dates. The first vessel which belonged to the town, and turned its harbour to account; the first brick house, the earliest stone one; and even the first gig of an ambitious citizen, subsequent to 1812, are all duly chronicled. Could we learn with equal truthfulness of the first years of the city built by Romulus on the Palatine Hill, its annals would tell no less homely truths, even now dimly hinted at in the legend of the scornful Remus leaping over its infant ramparts. Tiber's hill was once the site only of the solitary herdsman's hut; and an old citizen has described to me his youthful recollections of Toronto as consisting of a few log-huts in the clearing, and an Indian village of birch-bark wigwams, near the Don, with a mere trail

through the woods to the old French fort, on the line where now upwards of two miles of costly stores, hotels, and public buildings mark the principal street of the busy city.

M. Theodore Pavi describes Toronto, in his *Souvenirs Atlantiques*, published at Paris in 1833, as still in the woods, a mere advanced post of civilisation on the outskirts of a boundless waste. “To the houses succeed immediately the forests, and how profound must be those immense forests, when we reflect that they continue without interruption till they lose themselves in the icy regions of Hudson’s Bay near the Arctic Pole.” Upwards of forty years have since elapsed, and that for New-World cities is an æon. Every year has witnessed more rapid strides, alike in the progress of Toronto, and in the clearing and settling of the surrounding country. Railways have opened up new avenues of trade and commerce, and borne troops of sturdy pioneers into the wilderness behind. So rapid has been the clearing of the forest, and so great the rise in the price of labour, that fuel, brought from the distant coal-fields of Pennsylvania, already undersells the cord-wood hewn in Canadian forests; and even Newcastle coal warms many a luxurious winter hearth. All is rife with progress. The new past is despised; the old past is unheeded; and for antiquity there is neither reverence nor faith. These are beginnings of history; and are full of significance to those who have wrought out some of the curious problems of an ancient past, amid historic scenes contrasting in all respects with this unhistoric but vigorous youth of the New World. The contrast between the new and the old is here sufficiently striking. Yet the old also was once new; had even such beginnings as this; and was as devoid of history as the rawest clearing of the

Far West.

There are other aspects also in which a New World, thus entering on its historic life, is calculated to throw light on the origin of civilisation. Though neither its forests nor its aborigines are primeval, they realise for us just such a primitive condition as that in which human history appears to begin. In all the most characteristic aspects of the Indian, as well as in the traces of native American metallurgy, architecture, letters, and science, we find reproduced the same phases through which man passed in oldest prehistoric times; and when, in the fifteenth and sixteenth centuries, we witness the mineral wealth of the Andes tempting European colonisation beyond the Atlantic, we only see the expeditions of new Argonauts; and realise incidents of the first voyage to the Cassiterides; or the planting of the infant colonies of Gadir, Massala, and Carthage by Phocian and Punic adventurers of the historic dawn. But the speculations of modern science carry us far beyond any dawn of definite history, even when research is directed to the evidence of man's primitive arts, and the origin of his civilisation.

The investigation of the underlying chronicles of Europe's most ancient human history has placed beyond question that its historic period was preceded by an unhistoric one of long duration, marked by a slow progression from arts of the rudest kind to others which involved the germs of all later development. From Europe, and the historic lands of Asia and Africa, we derive our ideas of man; and of the youngest of these continents, on which he has thus advanced from savage artlessness to the highest arts of civilisation, we have history, written or traditional, for at least two thousand years. But in the year 1492 a New World was discovered, peopled

with its own millions, for the most part in no degree advanced beyond that primeval starting-point which lies far behind Europe's oldest traditions. To have found there beings strange as the inhabitants of Swift's Houyhnhnm's Land, or the monsters conjured up in the philosophic day-dreams of Sir Humphry Davy for the peopling of other planets,[7] would have seemed less wonderful to the men of that fifteenth century than what they did find: man in a state of savage infancy, with arts altogether rudimentary; language without letters, tradition without history, everything as it were but in its beginning, and yet himself looking back into a past even more vast and vague than their own. The significance of this state of things is worth inquiring into, if it be for nothing else than the light which the analogies of such a living present may throw on the infancy of Europe, and beyond that, on the primal infancy of the human race.

Recent discoveries of primitive art in the diluvial formations both of France and England have tended to add a fresh interest to the investigation of that "primeval stone-period" which underlies the most ancient memorials of Europe's civilisation. The oldest of all written chronicles assigns a period of some duration in the history of the human race, during which man tilled the ground, pursued the chase, and made garments of its spoils, without any knowledge of the working in metals, on which the simplest of all known arts depend. Through such a primitive stage it had already appeared to me probable that all civilised nations had passed,[8] before disclosures of a still older flint-period in the chroniclings of the drift added new significance to the term *primeval*, in its application to the non-metallurgic era of Europe's arts.

The incredulity and even contempt with which the application of a system of archæological periods to the antiquities of Britain was received, in recent years, by a certain class of critics, was inevitable, from the exclusive attention previously devoted to Roman and medieval remains. But the attention of the antiquary, as well as the geologist, is now being directed to conclusions forced on both by the traces of man in the stratified gravel of post-pleiocene formations. The circumstances attending their repeated discovery place their remote antiquity beyond question. The difficulty indeed is to bring the phenomena illustrated by palæolithic relics of the quaternary period into any conceivable harmony with the limits of chronology as hitherto applied to man. The pre-Celtic architects of the British long-barrow, and the allophyliæ of the European stone age, are but men of yesterday in comparison with the FLINT-FOLK OF THE DRIFT. They belong to a lost Atlantis,—another continent, now in part at least buried beneath the ocean; and compared with which the Old World of history is as new as that found for it by Columbus.

The disclosures of geology have familiarised us with the conviction that the “stable land,” the “perpetual hills,” and the “everlasting mountains” are but figures of speech. But the idea forces itself on reluctant minds that man himself has witnessed the disappearance of Alpine chains and the submergence of continents. The Pacific archipelagos are but the mountain-crests of a southern continent, which in earlier ages may have facilitated the wanderings of the nations. The startling discoveries in the French and English drift are results of oscillations of the northern hemisphere, which, in times nearer to historic centuries, depressed the bed of the Baltic in

the era of the Danish kjökkenmöddingr, and made dry land of the upper estuaries of the Forth and Clyde. It is doubtful, indeed, if the shallowing of Danish and Scottish seas by the rise of their ocean-beds is altogether a work of prehistoric times. The rise still going on in parts of the Swedish coast is a phenomenon long familiar to geologists; and the upheaval of the Scottish region, embracing the valleys of the Forth and Clyde, it now appears probable, has been protracted into historic times, and has even affected the relative levels of sea and land since the building of the Roman wall.

The changes thus witnessed on a comparatively small scale, on familiar areas, help us in some degree to estimate the vast physical revolutions that have taken place throughout the northern hemisphere within that recent geological period which succeeded the formation of the pleiocene strata. One of the most remarkable phenomena now recognised as affecting the conditions of life in recent geological epochs is the prolonged existence, throughout the whole northern hemisphere, of a temperature resembling that of the Arctic regions at the present time. After a period more nearly assimilating in climatic character to the tropics, though otherwise under varying conditions, the temperature of the whole northern hemisphere gradually diminished towards the end of the tertiary epoch, until the highlands of Scotland and Wales—then at a much higher elevation,—resembled Greenland at the present time, and an Arctic temperature extended southward to the Pyrenees and the Alps. Glaciers formed under the influence of perpetual frost and snow descended into the valleys and plains over the greater portion of Central Europe and Northern Asia, and an Arctic winter reigned throughout.

This condition of things, pertaining to what is known as the glacial period, was unquestionably of long duration. But after some partial variations of temperature, and a consequent advance and retrocession of the glacial influences along what was then the border lines of a north temperate zone, the first period of extreme cold drew to a close. Between the Alps and the mountain ranges of Scotland and Wales, the winter resembled that which even now prevails on the North American continent, in latitudes in which the moose, the wapiti, and the grizzly bear, freely range over the same areas where during a brief summer of intense heat enormous herds of buffalo annually migrate from the south. A similar alternation of seasons within the European glacial period can alone account for the presence, alongside of an Arctic fauna, of animals such as the hippopotamus and the hyæna, known only throughout the historical period as natives of the tropics. The range of temperature of Canadian seasons admits of the Arctic skua-gull, the snow-goose, the Lapland bunting, and the like Arctic visitors, meeting the king-bird, the humming-bird, and other wanderers from the gulf of Mexico.

Such conditions of climate may account for the recovery of the remains of the reindeer and the hippopotamus in the same drift and cave-deposits of Europe’s glacial period. The woolly mammoth and rhinoceros, the musk-ox, reindeer, and other Arctic fauna, may be presumed to have annually retreated from the summer heats, and given place to those animals, the living representatives of which are now found only in tropical Africa. A period of depression followed, during which, throughout an extensive area, all but the highest levels was submerged beneath an Arctic ocean, and the drift and boulders

of the highlands of Norway and Scotland were dispersed by means of icebergs over the low levels of what was then an archipelago, in which only the higher peaks of Britain rose out of the sea. Far to the south of the Thames and the Seine, the drift of this Arctic ocean was then accumulating the evidence which now reveals to us the fauna and the arts of quaternary Europe; just as the overlying boulders of the American drift far south in the Ohio valleys show their derivation from the Laurentian mountains of Canada. With the elevation of the old ocean-bed there appears to have been a renewal of an Arctic temperature indicated by the traces of local glaciers in the mountains of Scotland, Cumberland, and Wales; and so the glacial period drew to a close. A gradual rise of temperature carried the lines of ice and perpetual snow further and further northward, excepting in regions of great elevation, as in the Swiss Alps. This was necessarily accompanied with the melting of the glaciers accumulated in the mountain valleys throughout the protracted period of cold. The broken rocks and soil of the highlands were swept into the valleys by torrents of melted ice and snow; the lower valleys were hollowed out and reformed under this novel agency; and the landscape assumed its latest contour of valley, estuary, and river-beds.

This is what the elder geologists, including Dean Buckland, accepted for a time as the evidence of the Mosaic deluge. It is now universally recognised as the product of no sudden cataclysm, but the result of operations carried on continuously throughout periods of vast duration, during which the memorials of animal and vegetable life of the pleiocene and pleistocene epochs were slowly imbedded in the accumulated débris of this diluvian reconstruction.

The characteristics of the fossil mammals of the post-glacial period differ in many respects so widely from all that we are accustomed to associate with the presence of man, that they help to suggest even an exaggerated idea of antiquity. Nevertheless, there is no break of continuity. Animals still living have their fossil representatives alongside of the pleiocene mastodon, cave-lion, and bear: if indeed the latter be not itself the *ursus ferox*, or grizzly bear of North America, the claws of which are still worn as the proudest trophy of the Red Indian hunter.

Of twenty-one species of post-glacial mammals identified in the deposits of Brixham Cavern, only four are regarded as extinct species, and these include the *ursus spelæus* and *hyæna spelæa*. But their habitats have been widely changed in the climatic and geographical revolutions which have intervened. Some have to be sought for within the Arctic circle; others in low latitudes, and on continents lying wholly outside of that world which was alone known to Aristotle and Pliny. Every thing indicates a revolution slowly wrought through unnumbered ages, during which the ancient fauna was being supplanted by novel species, including those which belong to the historical period of temperate Europe. So far as appears from present evidence, man himself has to be included among the new additions to the European fauna. To this post-glacial period must, at any rate, be assigned the advent of the Flint-Folk of the Drift: a race of hunters and fishers not greatly differing in their rude arts from the more immediate precursors of the Historic races in Europe's Stone Age; but who were contemporaneous with the Siberian mammoth and other extinct elephants, the woolly rhinoceros, the musk-ox, and the reindeer of France; and with numerous extinct carnivora of

proportions corresponding to the gigantic herbivora on which they preyed.

The regions in which remains of the Flint-Folk have hitherto chiefly occurred embrace the valleys of Northern France and Southern England, where now the vine and the hop clothe the sunny slopes with their luxuriance. But as fresh evidence accumulates, corresponding indications are found to extend to the shores and islands of the Mediterranean. Traces of Europe's neolithic artificers have been found in the caves of Gibraltar; and among a singularly interesting accumulation of flint-flakes, polished stone axes, rude pottery, etc., lying beside the skeletons of their owners, in the same caves of Andalusia from one of which a golden tiara of primitive workmanship has been recovered.[9] Among remoter traces in the Maccagnone, Sicilian cave, Dr. Falconer could discover nothing suggestive of a different period for the rude flint implements and the numerous bones of the hippopotamus, mammoth, cave-lion, and other fossil mammals with which they were conjoined; while far eastward, near Beyrout, the Rev. H. B. Tristram reports the occurrence, in the stalagmitic flooring of a limestone cave, of bones and teeth assigned to a fossil ox, the red-deer, and the reindeer, alongside of the flint-knives or flakes which the prehistoric cave-men of Lebanon had used when feasting on such prey.[10] But though such traces occur on ancient historic sites, we search in vain for any connecting link between the oldest historic races and those belonging to an era which one distinguished geologist has designated as "The Second Elephantine Period";[11] when, according to his reconstruction of the physical geography of the region, the Thames was a tributary of the Rhine; the English Channel was not yet in

being, and Britain existed only as part of a continent which stretched away uninterruptedly northward towards the Arctic circle.

It thus appears that the advent of man in Northern Europe is assignable to a period when the mammoth and the tichorine rhinoceros still roamed its forests, and the great cave-tiger and other extinct carnivora haunted its caverns; when the gigantic Irish elk, the reindeer, the musk-ox, and the wild horse were objects of the chase; and the hippopotamus major was a summer visitor to the Seine and the Thames. When first employing the term *prehistoric* which has since obtained such universal acceptance, I remarked, in reference to Scottish aboriginal traces: "There is one certain point in this inquiry into primitive arts which the British antiquary possesses over all others, and from whence he can start without fear of error. From our insular position it is unquestionable that the first colonist of the British Isles must have been able to construct some kind of boat, and have possessed sufficient knowledge of navigation to steer his course through the open sea."[12] It then seemed a postulate on which the most cautious adventurer into the great darkness which lies behind us might confidently take his stand. But the point was no certain one after all. The fauna of the later Elephantine period still roamed over a wide continent unbroken by the English Channel or the Irish Sea; and the valley of the Rhine stretching northward through the still unsubmerged plain of the German Ocean, received as tributaries the Thames and the Humber, perhaps also the Tweed and the Forth. Measured therefore by the most moderate estimate of geological chronology, the historical period is, in relation to the interval since the first appearance of man, somewhat in a

ratio with the superficial soil and vegetable mould, as compared with the whole deposits of the stratified drift: in other words, it is so insignificant as, in a geological point of view, to be scarcely worth taking into account.

Whatever be the consequences involved in such comprehensive inductions, proofs appear to accumulate, with every renewed search, of the wide diffusion throughout the bone-bearing drift of the post-glacial period, of symmetrically-formed flints, bearing indubitable traces of intelligence and primitive mechanical skill.

It is the old argument of Paley, reproduced in a form undreamt of in his philosophy. “If,” he might have said, “in digging into a bank of gravel we find a flint, we do not pause to ask whence it came; but if our spade strike on a watch?”——In the age of the Flint-Folk mechanical ingenuity expended itself for other purposes than the manufacture of time-measurers; but if the artificial origin of the implements of the drift, and their consequent indications of the presence of man, be acknowledged, our greatest difficulty is the remoteness of the period which they seem to indicate. Worked flints and other assumed human industrial remains have now been recovered from caverns, in various countries of Europe, as in the caves of Engis and Chokier, near Liége; at Mont Salève, Geneva; in the south of France, in Belgium, and in England: in every case so mingled with remains of the mammoth, rhinoceros, hyæna, and other extinct mammals, as to lead to the conviction of their contemporaneous deposition. Recent carefully conducted explorations in the Devonshire caves have resulted in seemingly indisputable proof that English flint-implements of the Amiens type are coeval with the extinct fauna;

and that consequently the presence of their manufacturers must be assigned to periods prior to the successive inundations and depositions by which Brixham cave was gradually filled with layers of water-worn gravel, silt, or cave-earth, bone breccia, and solid floorings of carbonate of lime.

The rudeness of many of the worked flints has suggested the idea of their accidental origin; but the most diligent search in the heaps of chalk-flints broken for the roads, in France or England, or crushed *in situ* by subterranean movements, as in the Isle of Wight, has failed to recover a single specimen resembling even the rudest implements of the drift; whereas, in the ancient flint pits of the Shawnees, and probably of the Mound-Builders of Ohio,—to which I shall again refer,—I have collected fractured flints of precisely the same types as those familiar to us among the rudest drift implements. They differ for the most part in size, and also in type, from those found in early British or Danish grave-mounds; but artificial origin and inventive design are as obvious in the one as in the other.

That forgery of drift implements has been practised latterly, especially by the French workmen, is indisputable, but this need not affect the question. The facts connected with their discovery had been on record for nearly a century and a half before their significance was perceived; and specimens lay unheeded in the British Museum and in the collection of the Society of Antiquaries of London, with their human workmanship undisputed, so long as their origin was ascribed to Celtic art.[13] In reality the explorers of the drift have been perplexed by the very abundance of the traces of art which it discloses. Dr. Rigollot states that in the pits of St. Acheul alone, between August and December 1854,

upwards of four hundred specimens were obtained. The lowest estimate of the number recovered in the valley of the Somme is 3000; but this is exclusive of the more dubious flint-flakes, styled knives, estimated by Sir Charles Lyell at many thousands more.[14] In England flint implements of the same peculiar type have already rewarded research in many localities; so that Mr. Evans justly remarks: "The number found is almost beyond belief."[15] Some reasons tending to account for their accumulation in such localities are discussed in the following chapter, in the light of analogous discoveries in the New World. But while it is no longer possible to question their artificial origin, and the consequent evidence of the presence of man in those localities where they abound, the haunts of those primeval hunters and fishers were the river-valleys of an elder world; and any attempt at estimating the time required for changes of climate, extinction of fauna, the succession of races implied in the phases of palæolithic and neolithic arts, and the gradual introduction and development of metallurgy, involves so many unknown quantities, that at present it must suffice to recognise as no longer disputable that the whole historic period of Northern Europe is insignificant when compared with the time requisite to account for all the phenomena in question. The relative chronology of the French drift is: *1st*, superficially, tombs and other remains of the Roman period, scarcely perceptibly affected in their geological relations by nearly the whole interval of the Christian era; *2d*, in the alluvium, seemingly imbedded by natural accumulation, at an average depth of 15 feet, remains of a European stone-period, corresponding to those of the recently discovered pfahlbauten, or lacustrine villages of the Swiss Lakes;

and, *3d*, the tool-bearing gravel, imbedding works of the Flint-Folk, wrought seemingly when the rivers were but beginning the work of excavating the valleys which give their present contour to the landscapes of France and England.

With such indications of the remoteness of the era of the Drift-Folk it scarcely calls for special notice, that their tools correspond to some of those found in cave-deposits, as in Kent's Hole, Devonshire; but that they are readily distinguishable from the smaller implements and weapons of the same material wrought by the primitive Barrow-Builders of Europe, or by modern savage tribes still ignorant of metallurgy. From whatever point we attempt to view the facts thus presented to our consideration, it becomes equally obvious that we are dealing with the traces of a period irreconcilable with any received system of historic chronology; but within which, nevertheless, we are compelled to recognise many indications of the presence of man.

By evidence of a like character, the intermediate but still remote periods of prehistoric centuries are peopled with successive races of men. Proofs of oscillation, upheaval, and derangement of the course of ancient rivers, had furnished indications of the enormous lapse of time embraced within the British stone-period before the discoveries of Abbeville and Amiens were heard of.[16] In the year 1819 there was disclosed in the alluvium of the carse-land, where the river Forth winds its circuitous course through ancient historic scenes, the skeleton of a gigantic whale, with a perforated lance or harpoon of deer's-horn beside it. They lay together near the base of Dunmyat, one of the Ochil Hills, twenty feet above the highest tide of the neighbouring estuary. Over this an accumulation of five feet of alluvial soil was

covered with a thin bed of moss. The locality was examined by scientific observers peculiarly competent to the task; and at the same time sufficient traces of the old Roman causeway were observed, leading to one of the fords of the Forth, to prove that no important change had taken place on the bed of the river, or the general features of the strath, during the era of authentic history.[17] Nor was this example a solitary one. Remains of gigantic Balænæ have been repeatedly found; and one skeleton discovered in 1824, seven miles further inland, was deposited in the Museum of Edinburgh University, along with the primitive harpoon of deer's-horn found beside it, which in this instance retained some portion of the wooden shaft by which it had been wielded. Among antique spoils recovered at various depths in the same carse-land, the collection of the Scottish Antiquaries includes a primitive quern, or hand-mill, fashioned from the section of an oak,—such as is still in use by the Indians of America for pounding their grain,—and a wooden wheel of ingenious construction, found with several flint arrow-heads alongside of it.

With such well-authenticated and altogether indisputable evidence already in our possession, the additions made to our grounds for belief in the antiquity of the prehistoric dawn of Britain or Europe do not materially affect the conclusions thereby involved, though they add to the apparent duration of the human era. Whatever difficulties may seem to arise from the discoveries at Abbeville and Amiens, or the older ones at Gray's Inn Lane, Hoxne, and elsewhere, in relation to the age of man, the chronology which suffices to embrace the ancient Caledonian whaler within the period of human history will equally adapt itself to more recent

disclosures. And lying, as the Scottish relics did, almost beneath the paving of the Roman causeway, they suffice to show that discoveries relative to the British Celt of Julius Cæsar's time, or to the Romanised Briton of Claudius or Nero, which have hitherto seemed to the antiquary to illuminate the primeval dawn, bear somewhat less relation to the period to which the Dunmyat and Blair-Drummond Moss harpoons belong, than the American aborigines of the fifteenth century do to primeval generations of the New World. The very question raised anew by such disclosures as the British drift, ossiferous caves, grave-mounds, and chance deposits reveal, is whether the ancient Celt, on whom Roman and Saxon intruded, was not himself a very recent intruder on older allophylian occupants?[18] If he was not, we are left to imagine for his race an antiquity and a history, compared with which the dreams of Merlin and the fables of Geoffrey of Monmouth are credible things.

With the advent of man antedated in geological eras, the Roman period becomes, in truth, a part of very modern history; and the vast ages computed to have intervened between the two periods baffle the fancy in its efforts to comprehend the links by which they are connected. But crude as are the arts of that primeval age, it will be seen that they compare favourably with those of uncultured man at any later period. Recent explorations, and especially those of the Dordogne caves of Central France, disclose carvings in bone, and engravings on ivory and slate, hereafter referred to, revealing an imitative skill, and powers of observation in the delineation of characteristic details of form and action, such as have rarely, if ever, been equalled in the art of modern uncultured races. If by the aid of those

singularly interesting disclosures, we do indeed recover traces of the Flint-Folk belonging to an era estimated by some scientific chronologists as antedating our own by hundreds of thousands of years, it is of no slight importance to perceive that the interval which has wrought such revolutions on the earth as are recorded in the mammaliferous drift, show man the same reasoning, tentative, and inventive mechanician, as clearly distinguished then from the highest orders of contemporary life of the Elephantine or cave periods, as he is now from the most intelligent of the brute creation. In truth, so far from arriving by such disclosures any nearer an anthropoid link between man and the brute, the oldest art-traces of the palæotechnic men of Central France not only surpass those of many savage races, but they indicate an intellectual aptitude in no degree inferior to the average Frenchman of the nineteenth century.

Much of the reasoning relative to the characteristics which archæological discoveries assign to man in his primeval stage originates in an illogical association of the concomitants of modern intellectual and social progress with the indispensable requisites implied in man's primary condition as a rational being. It is not necessary for the confirmation of a primeval Stone or Flint Period, that we degrade man from that majestic genesis of our race, when he heard the voice of the Lord God amongst the trees of Paradise and was not afraid. Still less is it requisite that we make of him that "extinct species of anthropoid animal" hastily invented by over-sensitive Mosaic geologists to meet the problematic case of pleistocene products of art. In that primeval transition of the ethnologist in which geology draws to a close, and archæology has

its beginning, amid all the rudeness of palæolithic art, we may still recognise the rational lord of creation, the being endowed, not with physical but moral supremacy; in whom intelligence and accumulated experience were to prove more than a match for all the brute force of those gigantic mammalia so familiar to us now in fossil disclosures of the drift-gravels and cave-earth. Even if no more is claimed for primeval man than a condition akin to that of many modern uncivilised races, we can still discern the new and higher order of beings for which all others were to make way.

But if our modern technological standards are to be the only received tests of intellectual nobility, "his fair large front and eye sublime," with all the suggestive picturings of Milton's primeval man, are vain. His arts, though ample enough for all his wants, if tested by such standards, declare him no better than "the ignoble creature that arrow-heads and flint-knives would indicate." He needed no weapons for war or the chase; implements of husbandry were scarcely less superfluous, amid a profusion ampler than the luxuriant plenty of the islands of the Southern Ocean. The needle and the loom were as foreign to his requirements as the printing-press or the electric telegraph. What use had he for the potter's wheel, or the sculptor's chisel, or the mason's tools? And if his simple wants did suggest the need of some cutting implement, the flint-knife, or

"Such other gardening tools as art, yet rude,
Guiltless of fire, had formed,"

harmonise with the simplicity of that primeval life, and its easy toils, far more naturally than the most artistic Sheffield cutlery could do, with all its requisite preliminary processes of mining, smelting,

forging, grinding, and hafting the needless tool.

The idea which associates man's intellectual elevation with the accompaniments of mechanical skill, as though they stood somehow in the relation of cause and effect, and with the intellectual as the offspring, instead of the parent, of the mechanical element, is the product of modern thought. The very element which begets the unintellectual condition of the savage is that his whole energies are expended, and all his thoughts are absorbed, in providing daily food and clothing, and the requisite tools by which those are to be secured; or where, as in the luxuriant islands of Polynesia, nature seems to provide all things to his hand, his degraded moral nature unparadises the Eden of the bread-fruit tree.

A primeval "Stone period" appears to underlie the most remote traces of European civilisation; and not only to carry back the evidence of man's presence to times greatly more remote than any hitherto conceived of, but to confirm the idea that his earliest condition was one not only devoid of metallurgy, but characterised by mechanical arts of the very simplest kind. But it does not necessarily follow that he was in a condition of intellectual dormancy. The degradation of his moral nature, and not the absence of the arts which we associate with modern luxury and enterprise, made him a savage. The Arab sheikh, wandering with his flocks over the desert, is not greatly in advance of the Indian of the American forests, either in mechanical skill or artistic refinement; yet the Idumean Job was just such a pastoral Arab, but, nevertheless, a philosopher and a poet, far above any who dwelt amid the wondrous developments of mechanical and artistic progress in the cities of the Tigris or the Euphrates. It is not to be inferred, however, that the whole history of the

human race is affirmed by the archæologist to disclose a regular succession of periods—Stone, Bronze, and Iron, or however otherwise designated, —akin to the organic disclosures of geology; or that where their traces are found they necessarily imply such an order in their succession. The only true analogy between the geologist and the archæologist is, that both find their evidence imbedded in the earth's superficial crust, and deduce the chronicles of an otherwise obliterated past by legitimate induction therefrom. The radical difference between the palæontologist and the ethnologist lies in this, that the one aims at recovering the history of unintelligent divisions of extinct life; the other investigates all that pertains to a still existing, intelligent being, capable of advancing from his own past condition, or returning to it, under the most diverse external circumstances.

Amid that strangely diversified series of organic beings which pertains to the studies of the geologist, there appears at length one, "the beauty of the world, the paragon of animals";[19] a being capable of high moral and intellectual elevation, fertile in design, and with a capacity for transmitting experience, and working out comprehensive plans by the combined labours of many successive generations. In all this there is no analogy to any of the inferior orders of being. The works of the ant and the beaver, the coral zoophyte and the bee, display singular ingenuity and powers of combination; and each feathered songster builds its nest with wondrous forethought, in nature's appointed season. But the instincts of the inferior orders of creation are in vain compared with the devices of man, even in his savage state. Their most ingenious works cost them no intellectual effort to acquire the craft, and

experience adds no improvements in all the continuous labours of the wonderful mechanicians. The beaver constructs a dam more perfect than the best achievements of human ingenuity in the formation of breakwaters, and builds for itself a hut which the author of the *Decline and Fall of the Roman Empire* justly contrasts in architectural skill with the ruder dwelling of the Asiatic Tartar. The bee, in forming its cell, solves a mathematical problem which has tasked the labours of acutest analysts. But each ingenious artificer is practising a craft which no master taught, and to which it has nothing to add. The wondrous, instinctive, living machine creates for itself the highest pleasure it is capable of in working out the art with which it is endowed; and accomplishes it with infallible accuracy, as all its untaught predecessors did, and as, without teaching, each new-born successor will do. To such architects and artists history does not pertain, for their arts knew no primeval condition of imperfection, and witness no progress. Of their works, as of their organic structure, one example is a sufficient type of the whole. The palæontologist's materials have been designated by one popular geologist, "the Medals of Creation"; and the term, though borrowed from the antiquary, has a significance which peculiarly marks the contrast now referred to between geology and archæology. Like medals struck in the same die, the multitude of examples of an extinct species, each exquisitely modelled coral, and every cast of a symmetrical sigillaria, repeat the same typical characteristics; and the poet's fancy may be accepted as literally true, in relation to the most ingenious arts which engage the study of the naturalist:—

"All the winged habitants of paradise,
Whose songs once mingled with the songs of angels,

Wove their first nests as curiously and well
As the wood minstrel in our evil day
After the labour of six thousand years."[20]

But with the relics of human art, even in its most primitive stage, it is otherwise. Each example possesses an individuality of its own, for it is the product of an intelligent will, capable of development, and profiting by experience.

Accumulated knowledge is the grand characteristic of man. Every age bequeaths some results of its experience; and this constitutes the vantage-ground of succeeding generations. The deterioration which follows in the wake of every impediment to such transmission and accumulation of knowledge no less essentially distinguishes man from the ingenious spinners, weavers, and builders, who require no lesson from the past, and bequeath no experience to the future. Man alone can be conceived of as an intelligent mechanician, starting with the first rudiments of art, devising tools, initiating knowledge, and accumulating experience. Whatever, therefore, tends to disclose glimpses of such a primitive condition, and of his earliest acquisitions in mechanical arts and metallurgic knowledge, helps to a just conception of primeval man. Let us then glance at the evidence we possess of such an initial stage of being. And first in seeming chronological order are those traces of human arts in the drift, or in ossiferous caves among the bones of strange orders of beings hitherto supposed to have long preceded the existence of man. In the ancient alluvial deposits—most modern among the strata of the geologist,—lie abundant traces of extinct animal life, belonging to that recent transitional era of the globe in which man first appears. In nearly all respects they present a contrast to everything we are

familiar with in the history of our earth as the theatre of human action. In a zoological point of view they include man and the existing races of animals, as well as extinct races which appear to have been contemporaneous with indigenous species. To the archæologist they are rich in records of that primeval transition in which the beginnings of history lie. How early in that closing geological epoch man appeared, or how late into that archæological era the extinct fossil mammals survived, are the two independent propositions which the sister sciences have to establish and reconcile.

The insular character of Great Britain renders it a peculiarly interesting epitome of archæological study, a microcosm complete in itself, and little less ample in the variety of its records than the great continent, divorced from it by the ocean; yet the question, as we have seen, is reopened: Was it already insular when its earliest nomad trod its unhistoric soil? The Caledonian allophylian, as we now know, pursued the gigantic whale in an estuary which swept along the base of the far-inland Ochils; and guided his tiny canoe, above an ocean-bed, which had to be upheaved into the sunshine of many centuries before it could become the arena of deeds that live associated on the historic page with the names of Agricola, Edward, Wallace and Bruce, of Montrose, Cromwell, and Mar. Its history dawns in an era of geological mutation; yet not more so than is now at work in other and neighbouring historic lands. It is a type of the changes which were gradually transforming that strange post-tertiary microcosm into the familiar historic Britain of this nineteenth century.

From an examination of the detritus and included

fossils, and the disclosures of peat-mosses, we learn that, when the British Isles were in possession of their first colonists, the country must have been almost entirely covered with forests, and overrun by animals long since extinct. In the deposits of marl that underlie the accumulated peat-bogs of Scotland and Ireland occur abundant remains of the fossil elk, an animal far exceeding in magnitude any existing species of deer. Its bones have been found associated with skeletons of the mammoth and other proboscidians, and with numerous teeth, jaws, and detached bones of the extinct rhinoceros, hippopotamus, hyæna, fossil ox, etc.; yet no doubt is now entertained that the elk was contemporaneous with man in the British Isles. Stone hatchets, flint arrow-heads, and fragments of pottery have been recovered alongside of its skeleton, under circumstances that satisfy geologists, as well as archæologists, of their contemporaneous deposition; its bones have been found with the tool-marks of the flint chisel and saw; and evidence of various kinds seems to exhibit this gigantic deer as an object of the chase, and a source of primitive food, clothing, and tools.

Professor Jamieson and Dr. Mantell note the discovery, in the county of Cork, of a human body exhumed from a marshy soil, beneath a peat-bog eleven feet thick. The soft parts were converted into adipocere, and the body, thus preserved, was enveloped in a deer-skin of such large dimensions, as to lead them to the opinion that it belonged to the extinct elk. In 1863, Professor Beete Jukes exhibited to the geological section of the British Association the left femur, with a portion of one of the tines of an antler, recently dug up in the vicinity of Edgeworthstown, lying in marl, under forty feet of

bog. A transverse cut on the lower end of the femur corresponded with another on the antler, by which they appeared to have been adapted for junction. After carefully examining this bone, I entertain no doubt of its having been cut by a sharp tool, and purposely prepared as the haft of the horn blade which lay beside it. When the two were fastened together, they must have made a formidable weapon. Other bones of this fossil deer have been observed to bear marks of artificial cutting; but one of the most interesting evidences of their use was produced at a meeting of the Archæological Institute, June 3, 1864, when the Earl of Dunraven exhibited an imperfect Irish lyre, found in the moat of Desmond Castle, Adare, the material of which was pronounced by Professor Owen to be bone of the Irish elk. The improbability of the recovery of a musical instrument coeval with the Irish elk has been greatly lessened by more recent discoveries. Among the carved bone and graven ivory relics of the Troglodytes of the Dordogne valley was a reindeer bone pierced at one end by an oblique hole, reaching to the medullary canal. By blowing upon this, as on a hollow key, a shrill sound is produced; and to this instrument accordingly M. Paul Broca applies the name of the rallying whistle. But a later discovery furnishes more definite evidence of ancient musical art. In 1871 M. E. Piette explored the cavern of Gourdan (Haute-Garonne), and there in a layer of charcoal and cinders, intermingled with flint implements, he found what he describes as a neolithic flute. It also is formed of bone, but pierced with holes at the side: an undoubted example of the art of one of Jubal's primitive disciples.

The evidence supplied by the ossiferous caves of England, as of the continents of Europe and America,

is full of interest from corresponding revelations. Kirkdale Cave, Yorkshire, has acquired a special celebrity from the description and illustration of its contents, given by Dr. Buckland in his *Reliquiæ Diluvianæ*, in connection with a diluvial theory subsequently abandoned; and Kent's Hole, Devonshire, one of the richest depositories of British fossil carnivora, yielded no less remarkable traces of primitive mechanical arts. Intermingled with remains of the rhinoceros, cave-hyæna, great cave-tiger, cave-bear, and other extinct mammalia in unusual abundance, lay not only worked flints and the like traces of human art, but also numerous implements wrought from their bones; and subsequent investigations of ossiferous caves in various localities, by competent scientific explorers, guided by the accumulated knowledge and experience of upwards of thirty years, have given precision to the ideas already entertained of the coexistence of man with the extinct fauna of the caves.

In those instances, as well as in similar disclosures in Belgium and Southern France, where the remains of man himself, as well as his handiwork, have been found associated with the fossil mammalia, the facts were for a time discredited, or explained away, as irreconcilable with long-accepted conclusions relative to the age and early condition of man. But in 1858 another ossiferous limestone cave was accidentally discovered at Brixham, in the vicinity of the famous Kent's Hole, and negotiations were soon after entered into with a view to its thorough exploration for purposes of science. Unlike Kent's Hole Cavern, after a succession of prolonged alternations of occupation by the carnivora of a late quaternary epoch; of submergence by local floods, with the deposition of

their detrital accumulations in beds of varying character and contents; and the formation over all, at favourable points, of a flooring of carbonate of lime upwards of a foot thick: the falling in of a portion of the roof closed up the entrance of Brixham Cave, except to the smaller rodents and burrowing animals. Its history as the resort of the older mammalia, and of man himself, was thus abruptly closed, and it thenceforth remained intact, until its recent exploration. Thus, though in its indications of the presence of man, its evidence is meagre when compared with Kent's Hole, it is wholly free from any confusing elements such as in that remarkable cavern manifestly pertain to Celtic, Roman, and even Saxon times.

Brixham Cave appears to have long been the resort of hyænas, who dragged their prey into its main passages, and left there the gnawed bones of the rhinoceros, the fossil horse and ox, the reindeer, roebuck, great red-deer, etc. It included unmistakable traces of the mammoth, or other huge proboscidian, was visited by the cave-tiger (*Felis spelæa*), and finally became a favourite haunt of the great cave-bear (*Ursus spelæus*), as well as of two other species of bears, one of which seems to correspond to the *Ursus arctos*, or brown bear, and another has been supposed to be identical with the *Ursus ferox*, or grizzly bear. From time to time it was also visited, and some of its remote recesses explored by man. Thirty-six flints in all have been recovered in the different strata of the cave beds. A few of those are simply unworked flints; but twenty-three of them betray traces of human workmanship and use; and include knives and oval and lanceolate blades, closely analogous to implements found in the Cavern of Aurignac, in the Pyrenees, and in that of Le

Moustier, in the Dordogne. Others, though mere flint-flakes, bear decided marks of use as scraping tools. Another implement is a round pebble of siliceous sandstone, weighing 1 lb. 3 oz., which must have been brought from a distance, and shows on the side opposite to that by which it is most readily grasped by the hand distinct evidence of its use as a hammer stone. One, and only one, object wrought from animal substance, a small cylindrical pin, or rod of ivory, accompanied the more durable flints. Some of those indications of the presence of man were found in the bottom, or shingle-bed, overlaid by undisturbed cave-earth rich in mammalian remains; and the entire succession of beds was overlaid by a layer of stalagmite in which bones of the mammoth, rhinoceros, and other fossil mammals occurred.

It does not appear that Brixham Cave had at any time been inhabited by man. It has no accumulation of split bones or broken tools, nor any traces of the hearth, as in Kent's Hole, or in the Caves of Dordogne and the Pyrenees. But the men of the mammoth period had resorted thither occasionally, —for hiding, it may be, or in pursuit of their prey; and thus dropped the worked flints which now reveal the evidence of their presence. There is no trace of human bones, or any indication that man fell a prey to the powerful wild animals which chiefly haunted the cave. But he explored its recesses, in one case at least, to a distance of seventy-four feet from the entrance; and unless we suppose him to have groped his way thither, when in search of a more effectual hiding-place from some human foe, it seems no unfair surmise that he carried with him the illuminating torch. The extinguished hearths of the French Caves, as at Aurignac and the Vezère, leave no room to question man's early acquaintance with

fire. Nor does it seem to me probable that, under the rigorous climate to which he was exposed in that remote post-glacial period, he could fail, as man, to employ the art of fire-making to alleviate his necessities, even as is now done under corresponding exigencies by the Arctic Esquimaux. Nevertheless it is to be noted that the flint implements found in Brixham Cave are of the rudest character; and like other specimens of the worked-flints of the men of the Drift or Cave periods, indicate a very slight development of constructive skill: unless, as hereafter shown from analogous American examples, there may be reason to regard many of them as merely in the first stage of manufacture into weapons or tools.

Kent's Cavern yielded a greatly more varied illustration of primitive arts, such as barbed harpoon heads, bodkins, awls, and needles of bone. Like others found in the French Caves, they suggest comparison with the ingenious arts of the Esquimaux: and may also justify the inference that in milder regions, and under other favouring circumstances, contemporary man, then as now, manifested a higher intellectual vigour when free from the exhausting strain involved in the battle for life, either of the modern hyperborean, or of the post-glacial artificer of the cave period.

At an epoch which, though still prehistoric, is modern when compared with the latest traces of post-glacial or cave periods, the worked flints and implements of bone, found in many European primitive deposits, in caverns, chambered cairns, barrows, and among the chance disclosures of the agriculturist, continue to exhibit the most infantile stage of rudimentary art. Fragments of sun-baked urns, and rounded slabs of slate of a plate-like form, are associated with indications of rude culinary

practices, illustrative of the habits and tastes of savage man. Broken pottery, calcined bones, charcoal ashes, and other traces of cooking operations, have been noted under similar circumstances, alike in England and on the continent of Europe; showing where the hearth of the Allophylian had stood. Along with those, in Kent's cavern especially, the flints lay dispersed in all conditions, from the rounded mass as it came out of the chalk, through various stages of progress, on to finished arrow-heads and hatchets; while small flint-chips, and partially used flint-blocks, thickly scattered through the soil, served to indicate that the British troglodyte had there his workshop, as well as his kitchen, and wrought the raw material of that primitive stone-period into the requisite tools and weapons of the chase. Nor were indications wanting of the specific food of man in the remote era thus recalled for us. Besides accumulated bones, shells of the mussel, limpet, and oyster, lay heaped together near the mouth of the cave, along with a palate of the scarus: indicating that the aborigines found their precarious subsistence from the products of the chase and the spoils of the neighbouring sea.

The same fact is further illustrated by similar relics of a subterranean stone dwelling at Saverock, near Kirkwall, in Orkney, situated, like the natural caverns of Torbay, close to the sea-shore. Accumulated remains of charcoal and peat ashes lay intermingled with bones of the small northern sheep, the horse, ox, deer, and whale, and also with some rude implements illustrative of primitive Orcadian arts; while a layer of shells of the oyster, escallop, and periwinkle, the common whelk, the purpura, and the limpet, covered the floor and the adjacent ground, in some places half a foot deep.

In the interval since I first drew attention to such traces of Scotland's prehistoric centuries, this class of remains has excited special interest. Ancient shell-mounds, analogous to the kjökkenmöddingr of Denmark, discovered on the coasts of Elgin and Inverness-shire, have yielded similar results; and the explorations of other mounds, especially that of Keiss, in Caithness, have proved beyond question that the natives of North Britain were familiar at a comparative late period with the Reindeer. Specimens of its horns have been found not only associated with flint implements, cups and personal ornaments of stone and shale, the miscellaneous heaps of fish-bones, littoral shells, and other débris of a kitchen-midden; but with the masonry of the Scottish Broch, or primitive round tower. Some of the reindeer horns thus found show marks of sawing and cutting, apparently with metal tools. How old they are may not be strictly determinable; but they serve to place the Scottish Reindeer Period in a very modern era, compared with that assigned to the "Reindeer Period" of France; and remove all grounds for rejecting the statement of Torfæus that, so recently as the twelfth century, the Jarls of Orkney were wont to cross the Pentland Firth, to chase the roe and the reindeer in the wilds of Caithness.

But recent discoveries replete with interest and value, which thus extend the resources of the European archæologist and anthropologist, are only known to me through the ordinary channels of information; and I turn therefore to another field of study and research, rendered valuable by the contrast which it presents in all ways to that of historic Europe, with its confusing elements pertaining to times when the ambition of Rome so overrode all nationalities, and obliterated the

memories of history, that even now it is hard to persuade some men there was a European world before that of the Cæsars.

The city of Toronto, on the northern shore of Lake Ontario, is built on the drift clays which have accumulated above the rocks of the Lower Silurian formation to an average depth of upwards of thirty feet, and in some places to more than seventy feet. The same overlying beds of boulder clay and drift-gravel extend with monotonous uniformity eastward from Lake Huron to the Ottawa; and throughout the lower valley of the St. Lawrence to Labrador. The traces of ancient life recovered from those Canadian glacial deposits, with very few exceptions, correspond to living species,—including Radiata, Mollusca, Articulata, and Vertebrata, now found in other latitudes. As might be anticipated, the older glacial beds indicate a more Arctic condition of life; and thus accord with other evidence in pointing to a gradual amelioration of climate in Northern America. But it is only in the boulder clay of the lower St. Lawrence that the palæontologist finds the fossils by means of which such conclusions are formed; and alongside of which it would be reasonable to anticipate traces of the presence of man. The construction of an esplanade along the margin of the Bay of Toronto, during recent years, exposed a cutting of upwards of two miles in length, and laid bare the virgin soil of the most populous site now devoted to the civilising processes of European colonisation in Upper Canada. The same drift clay and gravel have been exposed in numerous other excavations, but hitherto without disclosures of interest to the archæologist. In two cases only, so far as I have been able to ascertain, did any trace of prior human presence appear. At the depth of nearly

two feet from the surface, in front of the Parliament buildings, the bones and horn of a deer lay amid an accumulation of charcoal and wood ashes, and with them a rude stone chisel or hatchet. More recently, to the west of the same spot, at a depth of eight or nine feet, one of the cervical vertebræ of the Wapiti (*Cervus Canadensis*), was found along with a rude stone hatchet and a lance-head of flint. But the travelled fossils of the Toronto drift are of a very different era, and belong to the Hudson river group of the Lower Silurian, like the rocks on which it is superimposed. With varying organic remains imbedded in its clay and gravel, the same formation overlies the true fossiliferous rocks of Western Canada; and seems to make of its long stretch of wooded levels and gentle undulations a country fitted to slumber through untold centuries under the shadow of its forests, a type of the earth of primeval man, until the new-born mechanical science of Europe provided for it the railway and the locomotive, and made its vast chain of rivers and lakes a highway for the steamboat. With such novel facilities added to the indomitable energy of the intruding occupants, the whole face of the continent is in rapid process of transformation; and it is well, ere the change is completed, that some note be made of every decipherable index of the characteristics of a past thus destined to speedy obliteration.

From the uncleared wilds that still occupy the shores of Lake Superior, south-eastward through the great lakes and rivers to the valley of the St. Lawrence, those drift deposits reveal to the geologist marvellous changes that have transpired in this extensive area of the North American continent. Along the low shores stretching away from the rapids of Sault Ste. Marie to Lake Superior, huge granitic

boulders lie strewed like the wreck of some Titanic Babel; raised beaches at various levels on the shores of Lakes Huron, Erie, and Ontario, show traces of other revolutions; and wherever the waves of the St. Lawrence reopen the deposits along the lower portion of the valley, the bottoms of an ancient ocean are revealed, frequently with littoral or deep-sea shells imbedded at different levels in the stratified drift. But remote as is the antiquity, according to all human chronology, to which the fauna of these beds of marine detritus belong, the palæontologist detects among their post-tertiary fossils the phoca, balænæ of more than one species, fishes, articulata, and the shells of many mollusca still inhabiting the neighbouring ocean along the northern Atlantic coasts. The period, therefore, which embraces those relics of ancient life is the same to which man belongs; and they mark for it one of the phases of that last transitional era during which the continent was being prepared for his entrance upon it. Since the natica, fusus, turritella, and other marine animals of the post-pleiocene period, were the living occupants of the St. Lawrence valley, vast changes have been wrought on the physical geography of the continent. The relative levels of the sea and land have altered, so as to elevate old sea-margins to the slopes of lofty hills, and leave many hundred miles inland escarpments wrought by the waves of that ancient sea. The conditions of climate have undergone no less important changes, developing in a corresponding degree the new character and conditions of life pertaining to this bed of an extinct ocean: covered with successive deposits of marine detritus, and then elevated into the region of sun and rain, to be clothed with the umbrageous forest, and to become

the dwelling-place through another dimly-measured period of the wapiti, the beaver, and the bison; and with them, of the Iroquois, the Huron, and the Chippewa: all alike the fauna of conditions of life belonging to a transitional period of the New World preparatory to our own.

Marvellous as are those cosmical revolutions belonging to the period of emergence of the northern zone of America from the great Arctic Ocean, when we look on each completed whole the process appears to have been characterised by no abnormal violence. Slowly through long centuries the ocean shallowed. The deep-sea organisms of a former generation were overlaid by the littoral shells of a newer marine life, and then the tidal waves retreated from the emerging sea-beach; until now we seek far down in the gulf of the St. Lawrence and on the coast of Labrador for the living descendants of species gathered from the post-pleiocene drift. Thus the closing epoch of geology in the New World, as in the Old, is brought into contact with that in which its archæology begins; and we look upon the North American continent as at length prepared for the presence of man.

Such records are here noted among the disclosures of the great valley of the St. Lawrence, which drains well-nigh half a continent; for it is in the valleys by which the present drainage of historic areas takes place, that not only such deposits of recent shells and fossil relics of existing fauna occur, but also that the most extensive remains of the extinct mammalia are disclosed, in association with objects serving to link them with those of modern eras. In formations of this character have been found, in the lower valley of the Mississippi, the *Elephas primigenius*, the *Mastodon Ohioticus*, the *Megalonyx*,

Megalodon, *Ereptodon*, and the *Equus curvidens*, or extinct American horse: with many other traces of an unfamiliar fauna, and also a flora, contemporaneous with those gigantic mammifers, but which also include both marine and terrestrial representatives of existing species. Corresponding in its great geographical outlines very nearly to its present condition, the American continent must have presented in nearly all other characteristics a striking contrast to its modern aspect, clothed though it seems to us in primeval forests, and scarcely modified by the presence of man. In the post-pleiocene formations of South Carolina, exposed along the bed of the Ashley River, remains of the megatherium, megalodon, and other gigantic extinct mammals occur, not only associated with existing species peculiar to the American continent, but also apparently with others, hitherto believed to have been domesticated and introduced for the first time by modern European colonists. But more interesting for our present purpose, as possibly indicating the contemporaneous existence of some of those strange mammals with man, are notices of remains of human art in the same formation. Professor Holmes, in exhibiting a collection of fossils from the post-pleiocene of South Carolina before the Academy of Natural Sciences of Philadelphia, remarked: “Dr. Klipstein, who resides near Charleston, in digging a ditch for the purpose of reclaiming a large swamp, discovered and sent to me the tooth of a mastodon, with the request that I should go down and visit the place, as there were indications of the bones and teeth of the animal still remaining in the sands which underlie the peat-bed. Accordingly, with a small party of gentlemen, we visited the doctor, and succeeded not only in obtaining several other teeth

and bones of this animal, but nearly one entire tusk, and immediately alongside of the tusk discovered the fragment of pottery which I hold in my hand, and which is similar to that manufactured at the present time by the American Indians."[21] It would not be wise to found hasty theories on such strange juxtaposition of relics, possibly of very widely separated periods. The Ashley River has channeled for itself a course through the eocene and post-pleiocene formations of South Carolina, and where these are exposed on its shores the fossils are washed from their beds, and become mingled with the remains of recent indigenous and domestic animals, and objects of human art. But the discovery of Dr. Klipstein was made in excavating an undisturbed and, geologically speaking, a comparatively recent formation. The tusk of the mastodon lay alongside of the fragment of pottery, in a deposit of the peat and sands of the post-pleiocene beds. Immediately underneath lie marine deposits, rich with varied groups of mollusca, corresponding to species now living on the sea-coast of Carolina, but also including two fossil species no longer to be met with there, though common in the Gulf of Mexico and the West Indian seas.

Here the palæontology of the New World discloses to us types of a fauna pertaining to its latest transitional period, which serve to illustrate the marvellous contrast between its commencement and its close. Until the discovery of teeth of the megatherium in the post-pleiocene bed of the Ashley River, remains of that extinct mammal had been found only in the state of Georgia, in North America, while the *Mastodon Ohioticus* and *Elephas primigenius* are among the well-known fauna of the Canadian drift. Of those, some North American localities have

furnished remains in remarkable profusion, but none more so than the celebrated morass in Kentucky, known by its homely but expressive name of the Big-bone Lick. Imbedded in the blue clay of this ancient bog, entire skeletons, or detached bones, of not less than one hundred mastodons and twenty mammoths, have been found, besides remains of the megalonyx and other extinct quadrupeds. A magnificent skeleton of the *Mastodon Ohioticus*, now in the British Museum, was discovered, with teeth and bones of many others, near the banks of La Pomme de Terre, a tributary of the Osage River, Missouri; and there once more we seem to come upon contemporaneous traces of man. "The bones," says Mantell, who examined them in the presence of Mr. Albert Koch, their discoverer, "were imbedded in a brown sandy deposit full of vegetable matter, with recognisable remains of the cypress, tropical cane, and swamp-moss, stems of the palmetto, etc., and this was covered by beds of blue clay and gravel to a thickness of about 15 feet. Mr. Koch states, and he personally assured me of the correctness of the statement, that an Indian flint arrow-head was found beneath the leg-bones of this skeleton, and four similar weapons were imbedded in the same stratum."[22] Some of the deductions of Mr. Koch were extravagant, and tended to bring discredit on his statement. But there appear to be no just grounds for doubting the main facts. A full-sized view of the large arrow-head is given in the Smithsonian Report of 1872. Another, but more dubious account, preserved in the *American Journal of Science*, describes the discovery in Missouri of the bones of a mammoth, with considerable portions of the skin, associated with stone spear-heads, axes, and knives, under circumstances which suggest the idea that it

had been entangled in a bog, and there stoned to death and partially consumed by fire.[23] Such contiguity of the works of man with those extinct mammals warns us at least to be on our guard against any supercilious rejection of indications of his ancient presence in the New World as well as in the Old.

Whether or not the mammoth and mastodon had been contemporary with man, their remains were objects of sufficiently striking magnitude to awaken the curiosity even of the unimpressible Indian; and traditions were common among the aborigines relative to their existence and destruction. M. Fabri, a French officer, informed Buffon that they ascribed those bones to an animal which they named the *Père aux Bœufs*. Among the Shawnees, and other southern tribes, the belief was current that the mastodon once occupied the continent along with a race of giants of corresponding proportions, and that both perished together by the thunderbolts of the Great Spirit. Another Indian tradition of Virginia told that these monstrous quadrupeds had assembled together, and were destroying the herds of deer and bisons, with the other animals created by the Great Spirit for the use of his red children, when he slew them all with his thunderbolts, excepting the big bull, who defiantly presented his enormous forehead to the bolts, and shook them off as they fell; until, being at length wounded, he fled to the region of the great lakes, where he is to this day.

The first notice in an English scientific journal of the fossil mammals of the American drift furnishes such a counterpart to the Shawnee traditions of extinct giants as might teach a lesson to modern speculators in science; when it is borne in remembrance that the difficulty now is to reconcile

with preconceived beliefs the discovery of works of human art alongside of their remains. In 1712, certain gigantic bones, which would now most probably be referred to the mastodon, were found near Cluverack, in New England. The famous Dr. Increase Mather soon after communicated the discovery to the Royal Society of London; and an abstract in the *Philosophical Transactions* duly set forth his opinion of this supposed confirmation of the existence of men of prodigious stature in the antediluvian world, as proved by the bones and teeth, which he judged to be human, "particularly a tooth, which was a very large grinder, weighing four pounds and three-quarters, with a thigh bone seventeen feet long."[24] They were doubtless looked upon with no little satisfaction by Dr. Mather, as a striking confirmation of the Mosaic record, that "there were giants in those days." To have doubted the New England philosopher's conclusions might have been even more dangerous then than to believe them now. Possibly, after the lapse of another century and a half, some of our own confused minglings of religious questions with scientific investigations will not seem less foolish than the antediluvian giants of the New England divine.

In all that relates to the history of man in the New World, we have ever to reserve ourselves for further truths. There are languages of living tribes, of which we have neither vocabulary nor grammar. There are nations of whose physical aspect we scarcely know anything; and areas where it is a moot point even now, whether the ancient civilisation of central America may not be still a living thing. The ossiferous caves of England have only revealed their wonders during the present century, and the works of art in the French drift lay concealed till our own

day. We cannot, therefore, even guess what America's disclosures will be. Discoveries in its ossiferous caverns have already pointed to the same conclusions as those of Europe. A cabinet of the British Museum is filled with fossil bones of mammalia, obtained by Dr. Lund and M. Claussen from limestone caverns in the Brazils, closely resembling the ossiferous caves of Europe. The relics were imbedded in a reddish-coloured loam, covered over with a thick stalagmitic flooring; and along with them lay numerous bones of genera still inhabiting the continent, with shells of the large *bulimus*, a common terrestrial mollusc of South America.

No clear line of demarcation can be traced here between the era of the extinct carnivora and edentata, and those of existing species; and there is therefore no greater cause of wonder than in the analogous examples of Europe, to learn that in the same detritus of those Brazilian caves Dr. Lund found human skeletons, which he believed to be coeval with some of the extinct mammalia. Nor have the first disclosures of works of art in the American drift still to be made. I have in my possession an imperfect flint-knife (Fig. 1), to all appearance as unquestionable a relic of human art as the most symmetrical of those assigned to a similar origin by the explorers of the French and English drift-gravels. It was given to me by Mr. P. A. Scott, an intelligent Canadian, who found it at a depth of upwards of fourteen feet, among the rolled gravel and gold-bearing quartz of the Grinell Leads, in Kansas Territory, while engaged in digging for gold. In an alluvial bottom, in the Blue Range of the Rocky Mountains, distant several hundred feet from a small stream called Clear Creek, a shaft was sunk, passing through four feet of rich black soil, and below this,

through upwards of ten feet of gravel, reddish clay, and rounded quartz. Here the flint implement was found, and its unmistakably artificial origin so impressed the finder, that he secured it, and carefully noted the depth at which it lay.

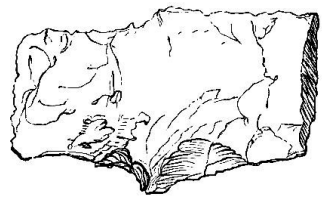


FIG. 1.—Flint-Knife, Grinell Leads.

It is difficult at present to test such chance evidence accurately. The discovery of the palæolithic implements of Europe had been recorded upwards of half a century before their true significance was recognised; whereas the American explorer is on the look-out for similar disclosures, and evinces at times a feeling as though the honour of his country is imperilled if he fail. It will be seen, moreover, from the narrative of a subsequent chapter, that the abundance of flint and stone implements in the virgin soil of the New World is almost marvellous. The discovery, therefore, of stray specimens in modern river-gravels, the washings of gold-drift, or in any excavations liable to be affected by surface admixtures, must be viewed with the utmost caution. Several flint implements from the auriferous gravel of California were produced at the Paris Exposition of 1855. According to the geological survey of Illinois, for 1866, the bones of the mastodon and other fossil mammals have been found in a bed of "local drift" near Alton, underlying the Loess; and at the same depth stone axes and flint spear-heads were obtained.[25]

But such disclosures of worked flints or polished implements of stone are cast into the shade by the reputed discovery of human remains in the auriferous drift of California. In 1857 Dr. C. F. Winslow produced a fragment of a human skull

found eighteen feet below the surface, in the "pay drift," at Table Mountain, in connection with the bones of the mastodon and fossil elephant. A later disclosure brought to light a complete human skull, reported to have been discovered in auriferous gravel, underlying five successive lava formations. Professor Whitney, after satisfying himself of the genuineness of the discovery, produced the skull at the Chicago meeting of the American Association for the Advancement of Science, in 1869, to the manifest delight of some who were prepared at once to relegate American man to a remoter epoch than the Flint-folk of the Abbeville and Amiens gravel drift. More recently a highly polished plummet of syenite, in the form of a double cone perforated at one end, was produced before the Chicago Academy of Sciences, as an implement found at a depth of thirty feet, in the drift-gravel of San Joaquin, California, by some workmen engaged in digging a well. In this case also Professor Whitney appears to have had no hesitation in assigning it to the age of the fossil elephant and mastodon. It does not seem to have been recognised how much more probable it is that a highly finished stone implement like the San Joaquin plummet should fall from the surface, in the process of excavation, and so be perhaps no older than the era of the Mexican conquest, than that it is a choice specimen of post-pleiocene art.

Much of the evidence hitherto adduced for the antiquity of the American man has a singularly modern aspect. The human skulls are of the predominant Indian type of the present day, though that need not surprise us. Dr. Usher only notes this in the case of the "human fossils" from the Brazil Caves, to add: "this consideration may spare science the trouble of any further speculation on the *modus*

through which the New World became peopled from the Old; for after carrying backwards the existence of a people monumentally into the very night of time, when we find that they have also preserved the same type back to a remote, even to a geological, period, there can be no necessity for going abroad to seek their origin."[26] The question of this fancied American type will come under review hereafter. But on a par with this evidence are fragments of baskets and clay vessels submitted to the New Orleans Academy of Sciences in 1867, as contemporary with the elephant and other fossil mammals, the bones of which were found in digging the same salt-pits in which the pottery and basket-work were met with; or a fragment of cane-matting presented to the Smithsonian Institution in 1866 by Mr. J. F. Cleu, along with portions of tusks and teeth of the fossil elephant which lay above it, at a depth of thirteen feet in a Louisiana salt mine. Matting, or basket-work, of split cane is as common among the contents of southern Indian graves as fragments of pottery; and both may be reasonably suspected to carry with them evidence inconsistent with any geological antiquity.

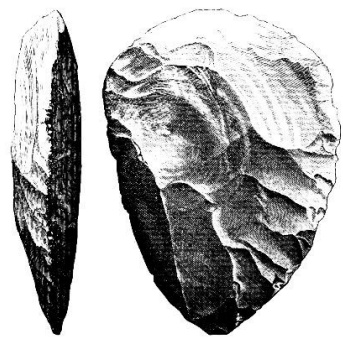


FIG. 2.—Lewiston Flint Implement. (5/7).

Mr. Charles C. Jones notes a discovery of a more suggestive character, due also to the search for gold. In the state of Georgia the river Chattahoochee flows through an auriferous region of the Nacoochee valley. From time to time the gold-diggers have made extensive cuttings through the soil and underlying drift-gravel, down to the slate-rock upon which it rests. During one of these excavations, at a depth of some nine feet, intermingled with the gravel and boulders of the drift, three large flint implements were found, measuring between three and four inches in length, and "in material, manner of construction, and appearance so nearly resembling some of the rough so-called flint hatchets belonging to the drift-type that they might very readily be mistaken the one for the others."[27] With those may not unfitly be classed a large implement of hornstone, now in the collection of the Scottish Antiquaries, obtained by me from a dealer in Indian curiosities at Lewiston in the State of New York, where it was said to have been found at a great depth when sinking a well. Its form, though common enough among the implements of the American Mound-Builders, rarely, if ever, occurs on so large a scale in Europe, except among palæolithic remains. Ovoid discs of the same class attracted the attention of the Rev. J. MacEnery in his early explorations of Kent's Cavern, and have anew been brought to light in the recent systematic researches there. Mr. Evans figures one found there in 1866 (Fig. 3), somewhat smaller, and more ovoid in outline, but of the same type. The Lewiston implement is shown in Fig. 2. It has been reduced to the present shape by comparatively few strokes; and on the reverse side it appears as if broken off by a final ill-directed blow. One edge is worn and fractured as if by frequent use.

Unfortunately more minute information of the locality and the circumstances attendant on its discovery could not be obtained. But even if it be regarded as only a stray relic of the same class as those hereafter described among the ancient mound deposits of Wisconsin and Ohio, it possesses a novel interest from its discovery near the banks of the Niagara River, where no traces of the Mound-Builders or their arts occur. Mr. Evans permits me to introduce here the analogous example from Kent's Cavern. It is of grey cherty flint, and chipped on both faces with more than wonted care. Though smaller than the Lewiston implement, the difference is only about half an inch; the larger of the two being a little over five inches long. I have purposely engraved the Lewiston disc on a large scale, in order to suggest more clearly the proportions of this class of implements; and to show the close analogy traceable between those of the American continent, and the European disclosures of the river and cave drift.

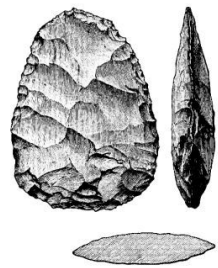


FIG. 3.—Flint Disc, Kent's Cavern. (½).

Such, then, are some of the indications which have been assumed to point to the ancient presence of man in the New World. If we estimate this by historical, and not by geological periods, whatever proofs of his antiquity archæology may supply will be found to accord with other evidence; and

especially with proofs furnished by the multitude of independent languages, and the diversity of types of race, ranging from the Arctic circle to Tierra del Fuego. But it would be rash to assume from the partial evidence yet obtained, that the juxtaposition of flint arrow-heads with the mastodon of Missouri, the pottery with bones and tusk of the same animal in the post-pleiocene of South Carolina, the human bones in the rich ossiferous caverns of the Brazils, or the flint implements, and human remains recovered from Californian and other auriferous drifts, unquestionably prove the existence of man on the American continent contemporaneously with the fossil elephant or the mastodon.

The proofs hitherto adduced have been at best only suggestive of further research. There is no question that Dr. Lund visited that portion of Brazil lying between the Rio das Velhas and the Rio Paraopeba, with very important palæontological results. He there found a mountain chain of limestone rock, abounding with fissures and caverns; and from some of these calcareous caves he recovered, not only the bones of numerous fossil mammals imbedded in red earth, but also human bones which he pronounced to be fossil. The remains included not only those of sloths and armadillos of gigantic size, but also extinct genera of monkeys, all assumed to have been contemporaries of the fossil cave-men. But experience is teaching the palæontologist that the mere recovery of bones or implements from the same cave is no proof of contemporaneity. A cave which had been filled with cave-earth and bone breccia, together with extinct animals of the period of the *glyptodon* and the *mylodon*, may in a long subsequent era have become the shelter or the place of sepulture of Indians.

Nearly forty years have elapsed since Dr. Lund's discovery. Since then the lamented Agassiz has visited Brazil with valuable results to science; but no additional light has been thrown on the significance of the disclosures of this interesting locality. One important fact, however, has not only been admitted, but insisted upon. The crania of the fossil men of Brazil betray no traces of approximation to that of the fossil monkey, but on the contrary differ in no respect from the predominant American Indian type; and the same has since been affirmed of a set of human skulls now in the Smithsonian collection, which were found incrusted with stalagmite, in a limestone cave in Calaveras County, California. Their fossil character and extreme antiquity were at first assumed to be indisputable. In this other respect they correspond with the Brazilian fossil remains. Professor Jeffreys Wyman reported of them that they present "no peculiarities by which they could be distinguished from other crania of California."[28]

Here then might seem to be additional proofs "that the general type of races inhabiting America at that inconceivably remote era was the same which prevailed at the period of the Columbian discovery";[29] and that, therefore, Dr. Morton's assumed uniform cranial type pertains to the American man from remotest geological time. There seems more reason, however, for believing that the Calaveras Cave was a place of interment of the present race of Indians; and that its crania are very modern compared even with the fossil Caribs of Guadaloupe. But the increasing evidence of the remote antiquity of the European man has naturally suggested a revision of the evidence adduced in confirmation of his ancient presence in the New World.

Sir Charles Lyell latterly regarded with greater

favour than he had once done, the possible coexistence of man with the mastodon, megalonyx, and other extinct species, among bones of which, in the loam of the Mississippi valley, near Natchez, a human pelvic bone was recovered, and made the basis of very comprehensive theories. In the delta of the same river, near New Orleans, a complete human skeleton is reported to have been found, buried at a depth of sixteen feet, under the remains of four successive cypress forests; and this discovery furnished the data from which Dr. Bennet Dowler has assigned to the human race an existence in the delta of the Mississippi 57,000 years ago.[30]

Evidence of this exceptional nature requires to be used with modest caution. Antiquaries of Europe having found tobacco pipes of the sixteenth and seventeenth centuries alongside of pottery and other undoubted remains of Roman art, have hastily antedated the use of tobacco to classic times.[31] On equally good evidence it might be carried back to those of the mammoth, as the discovery of a similar relic has been recorded at a depth of many feet, in sinking a coal-pit at Misk, in Ayrshire.[32]

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[6] *The British Dominions in North America.* Lond. 1832. Vol. i. p. 89.

[7] *Consolations in Travel, or the Last Days of a Philosopher.*

[8] *Prehistoric Annals of Scotland*, vol. i. p. 41.

[9] *Antiguedades Prehistoricas de Andalusia*, Madrid, 1868.

[10] *The Land of Israel: a Journal of Travels in Palestine*, 1865, p. 11.

[11] J. Trimmer: *Jour. Geol. Soc.*, vol. ix.

[12] *Prehistoric Annals of Scotland*, 1851, 1st Ed. p. 29.

[13] *Archæologia*, vol. xiii. p. 206; vol. xxxviii. p. 301.

[14] *Antiquity of Man*, 4th Ed. p. 190.

[15] *Archæologia*, vol. xxxviii. p. 296.

[16] *Prehistoric Annals of Scotland*, 1st Ed. p. 33.

[17] *Edin. Phil. Jour.*, i. 395.

[18] This question was first brought forward by the author in an "Inquiry into the Evidence of the existence of Primitive Races in Scotland prior to the Celtæ."—*British Association Report*, 1850.

[19] *Hamlet*, Act ii. sc. 2.

[20] Montgomery, *Pelican Island*.

[21] *Proceedings of the Academy of Natural Sciences, Philadelphia*, July 1859, pp. 178, 186.

[22] Mantell's *Fossils of the British Museum*, p. 473.

[23] *American Journ. of Science and Arts*, vol. xxxvi. p. 199, First Series.

[24] *Philosophical Transactions*, vol. xxiv. p. 85.

[25] *Geol. Survey of Illinois*, by A. H. Worthen, vol. i. p. 38.

[26] *Types of Mankind*, p. 351.

[27] *Antiquities of the Southern Indians*, p. 293.

[28] *Smithsonian Report*, 1867, p. 407.

[29] Dr. Usher, *Types of Mankind*, p. 351.

[30] *Types of Mankind*, p. 272.

[31] *La Normandie Souterraine*, p. 76.

[32] *Prehistoric Annals of Scotland*, vol. ii. p. 505.

CHAPTER III.

THE QUARRY.

THE QUARRY—BRIXHAM CAVE—BRIXHAM FLINT IMPLEMENT—FLINT RIDGE, OHIO—FLINT PITS—DRIFT QUARRY DEPOSITS—TRACES OF PALÆOLITHIC ART—LANCEOLATE FLINTS—ALMOND-SHAPED FLINTS—THE SHAWNEES—THE COLORADO INDIANS—CACHES OF WORKED FLINTS—SEPULCHRAL DEPOSITS—CAVE-DRIFT DISCLOSURES—ILLUSTRATIVE ANALOGIES—CINCINNATI COLLECTIONS—HORNSTONE SPEAR-HEADS—AMERICAN NEOLITHIC ART—FLINT DRILLS—MODES OF PERFORATION—FLINT KNIVES—RAZORS AND SCRAPERS—ARROW-HEAD FORMS—DISCOIDAL STONES—SINKERS AND LASSO-STONES—CUPPED STONES—ARCHÆOLOGICAL THEORIES—GEORGIA BOULDERS—HAND CUP-STONES—NEOLITHIC GRINDSTONES—ARCHÆOLOGICAL ENIGMAS—ANCIENT ANALOGIES.

If mere rudeness is to be accepted as the

indication of the first artless efforts of man to furnish himself with tools, the investigator into primeval history may assume that in the rudest of the drift and cave implements he has examples of the most infantile efforts in the industrial arts. He may even indulge the fancy that in the large, unshapely flint implements recovered from ossiferous caves and alluvial deposits, alongside of remains of the extinct fauna of a palæolithic period so dissimilar to any historical era, he has traced his way back to the first crude efforts of human art, if not to the evolutionary dawn of a semi-rational artificer. It is a significant fact that no such clumsy unshapeliness characterises the stone implements of the most degraded savage races. Examples may indeed be produced, selected for their rudeness, from among the implements of modern savages. But Bushmen, Patagonians, Mincopies, Australians, or whatever other race be lowest in the scale of humanity, each display ingenuity and skill in the manufacture of some special tools or weapons. Nor is it less worthy of note that the commoner implements and weapons of flint and stone recovered from ancient Scandinavian, Gaulish, and British graves, from the lake-dwellings of Switzerland, the Danish shell-mounds, and other European depositories of prehistoric industrial art, are scarcely distinguishable from the flint-knives, scrapers, lance and arrow-heads, or the stone gouges, axes, and mauls, of the Red Indians, or of the Islanders of the Pacific. Peculiar types do indeed occur; and the materials abounding in special localities, such as the obsidian of Mexico, or the greenstone of Tasmania, give a specific character to the implements of some regions; but, on the whole, the arts of the stone periods of different races, however widely separated alike by space and time,

present so many analogies that they seem to confirm the idea of certain instinctive operations of human ingenuity finding everywhere the same expression within the narrow range of non-metallurgic art. Few facts, therefore, related to this branch of the subject have impressed me more than the essentially diverse types characteristic of the massive and extremely rude implements of the caves and river-drift. They seem to point to some unexplained difference between the artificer of the Mammoth or Reindeer period, and the tool-maker of Britain's neolithic era, or the Indian savage of modern times.

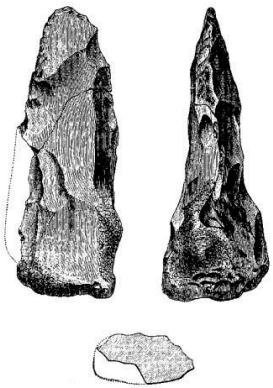


FIG. 4.—Brixham Cave Flint Implement. (Evans). (½).

Sufficient correspondence is traceable between the implements of the cave-earth and the river-drift to assign them to the same era; and so to justify us in testing its arts by their combined disclosures. The ossiferous cave of Brixham, which has recently been subjected to an exhaustive scientific investigation, consists of a series of galleries and passages in the Devonshire limestone. They are partly natural fissures, and partly chambers hollowed out by the action of running water. Those have been refilled with gravel, red cave-earth, and layers of stalagmite,

which were in process of deposition while the *ursus spelæus*, or great cave-bear, still haunted their recesses, and when the reindeer was a native of the neighbouring region. Though visited from time to time by man, Brixham cave had never been made his dwelling-place or workshop; and so it has revealed only his rudest tools. Of these, Fig. 4 is a characteristic example of a rude lanceolate implement, which embodies within itself some very significant glimpses of the era to which it belongs. The great valleys were excavated and refilled with the rolled gravel of the drift during the prolonged operations of ice and floods. But it is here seen that the violence of the floods extended even to the recesses of the caves. The implement has been broken into three pieces, evidently at the period of the original filling up of the cave. One portion was recovered buried in the cave-earth of the flint-knife gallery; another fragment lay far apart, under three and a half feet of earth, in a neighbouring gallery; while a third portion has escaped even the careful and discriminating search which resulted in the recovery of those long-dissevered fragments. It has to be borne in remembrance that every fragment of flint found in the cave-earth was preserved, whether showing traces of human workmanship or not. Thirty-two fragments were discovered in all; with an interval of nearly a month between the finding of the first and second portions of the implement figured here. A still longer period elapsed before it was noticed that they fitted to each other as parts of the same worked flint. Most of the fragments so found have undergone great alteration in their structure, and have become absorbent and brittle. How little chance, therefore, is there that any delicately formed flint-tool should be recovered in the rolled gravel-

beds!

But the comparatively virgin soil of the New World has examples of like primitive workmanship in reserve, to illustrate the significance of some of those amorphous flints which bear the evidence of art, and yet seem almost too artless for any purpose of man. The valleys of the Ohio and its tributaries have a special attraction as the sites of numerous earthworks and other remains of a prehistoric race, known, from one prominent class of their structures, as the Mound-Builders. In more recent centuries, within the period of European intercourse with the New World, the same valleys have been occupied by warlike tribes of the Red Indian race; and now that an industrious population has supplanted their ephemeral lodges with the cities and farmsteads of the Anglo-American settler, the traces even of the latest aborigines seem primitive as those of Europe's neolithic era. During the summer of 1874 I devoted part of the long vacation to an inspection of some of the most remarkable earthworks and other ancient remains of this interesting locality; and among other objects illustrative of its past history, I visited the Flint Ridge, a siliceous deposit of the carboniferous age, which extends through the State, from Newark to New Lexington, and has been worked at various points to furnish materials for native implements. Here I had an opportunity of exploring the ancient pits from which it is assumed that the constructors of the gigantic earthworks of the neighbouring valleys procured the flint, or hornstone, of which their weapons and implements were chiefly made. The point visited is on the summit of an undulating range of hills about ten miles distant from the city of Newark and its remarkable earthworks, hereafter described. At various points along the ridge, both

there and in other parts of the State, numerous funnel-shaped pits occur, varying from four or five to fifteen feet deep; and similar traces of mining may be seen in other localities, as at Levenworth, about three hundred miles below Cincinnati, where the grey flint, or chert, abounds, of which large implements are chiefly made. The sloping sides of the pits are in many cases covered with the fractured flints, broken up, and partially shaped as if for purposes of manufacture. There for the first time I looked upon true counterparts of the drift implements; and in the course of an hour or two had no difficulty in procuring specimens closely repeating many forms familiar among those common to the cave-earth and the drift-gravel of France and England.

We are apt to think of the old flint and stone-workers as merely picking up the chance materials suited to their simple craft. But the use of flint in the manufacture of sling-stones, arrow-heads, and other missile weapons, as well as of all ordinary household implements, and those of war and the chase, involved a constant demand for fresh materials, frequently procurable only from distant localities. It is what might be assumed, therefore, apart from any direct evidence, that a regular system of quarrying for flint nodules best fitted for the tool-makers' art was pursued; and that a trade or barter in the raw material furnished supplies to tribes remote from the flint-bearing chalk or gravel. But also it appears from the interesting explorations of Colonel A. Lane Fox at Cissbury, near Worthing,[33] and from those of the Rev. W. Greenwell, at Grime's Graves, near Brandon, in Norfolk,[34] that the flint nodules were not only quarried, but prepared on the spot; so that the miner carried off with him, not a mere load of flint nodules,

as the modern manufacturer might burden himself with the iron ore: but flints of the required dimensions, roughly shaped for the final operation which was to fashion them into knives, scrapers, arrow and lance-heads, hatchets, etc. Precisely the same process is manifest in the remains found in the pits of Flint Ridge, Ohio. Flakes or spawls, knives, scrapers, almond and lanceolate blocks, abound in the first crude stage of manufacture. In studying those on the spot, I was strongly impressed by the similarity of many of them to the ruder implements of the drift; and hence was led to surmise that in the latter also we have in many cases, not the artless implements which fitly suggest a maker correspondingly deficient in even such skill and reasoning as guides the modern tool-making savage; but only rudely-blocked flints, fresh from the quarry, and in a condition least susceptible of injury in the violence to which the tool-bearing gravels have necessarily been subjected. May it not be, moreover, that in some of the richest deposits of such worked flints in the gravels of France and England, we have really the dispersed materials of such quarry accumulations, and not the stray implements of individual hunters? In this way only can we satisfactorily account for the fact that such traces of primeval man are now successfully sought for on purely geological evidence. The archæologist digs into the Celtic or Saxon barrow, and finds as his reward the implements and pottery of its builder. But English geologists, having determined the character of the tool-bearing gravel of the French drift, have sought for flint implements in corresponding English strata, as they would seek for the fossil shells of the same period, and with like success. They have now been obtained in Suffolk, Bedford, Hartford, Kent,

Middlesex, and Surrey.[35] So entirely indeed has the man of the drift passed out of the province of the archæologist, that in 1861 Professor Prestwich followed up his "notes on further discoveries of flint implements in beds of post-pleiocene gravel and clay," with a list of forty-one localities where gravel and clay-pits, or gravel-beds occur, as some of the places in the south of England where he thought flint implements might also by diligent search possibly be found, and subsequent discoveries have confirmed his anticipations.

It has been felt by many as an element which in some degree detracted from the otherwise incontrovertible force of this accumulated proof, that where the wrought flints are discovered *in situ*, they occur in beds of gravel and clay abounding in unwrought flints in every stage of accidental fracture, and including many which the most experienced archæologist would hesitate whether to classify as of natural or artificial origin. But on the assumption of regular quarrying and working in the flint-bearing strata, such traces of palæolithic art may be expected to occur in the river-gravels, as a geological formation in which the requisite material abounded; and which, moreover, in its latest reconstruction belongs to the river-valleys best adapted to be the habitat of post-glacial man. They are, in fact, the localities to which the experience of the archæologist would direct him when in search of the traces of rude hunting and fishing tribes; but also they are the same mammaliferous strata to which the geologist turns when looking for remains illustrative of the extinct fauna of the post-glacial age.



FIG. 5.—Lanceolate Flint, Flint Ridge, Ohio, (2/3).

In and around the pits of Flint Ridge, Ohio, are now to be seen the accumulated results of centuries of mining and quarrying, extending in all probability from the era of the Mound-Builders to the extinction of the Miamis, Shawnees, and other recent occupants of the Ohio valley. Swept by floods into the lower valleys, the smaller fragments would be broken up and disappear; and only such specimens would survive unchanged as in the valley of the Somme have startled archæologists by their numbers; and tempted sceptics to assign their origin to accidental fracture in the beds of gravel and unwrought flints in which they chiefly occur. In Fig. 5 a worked flint is shown, picked up in one of the pits on Flint Ridge, in Licking County, Ohio. A small piece has been broken off the point by recent fracture. Its analogy to one familiar type of drift implements can scarcely admit of question. This, it will be remembered, had never been removed from the pit, and doubtless represents the material thus roughly blocked out, from which the old artificer designed to fashion a finished tool. Another common type is shown in Fig. 6, roughly chipped into the crude form of an almond-shaped blade. Some of the specimens acquired by me are weather-stained from long exposure, and others discoloured and brittle; but many of them exhibit

little traces of the effect of time. It may be doubted, indeed, if any of them can be regarded as of remote antiquity; though, doubtless, the ancient Mound-Builders

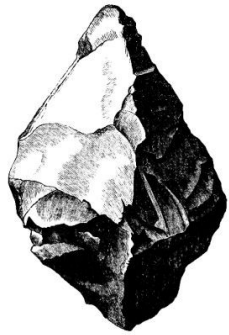


FIG. 6.—Almond-shaped Flint, Flint Ridge, Ohio. (2/3).

derived the materials for their stone implements from this inexhaustible source; and specimens of the same class of worked flints are frequently met with in the vicinity of the mounds, and even among their contents. Flint-flakes, and rudely-fashioned knives and scrapers, are so common in the ploughed fields, that they are spoken of generally throughout Ohio and Kentucky by the name of “spawls.” It is difficult, indeed, to make a selection from the abundant materials illustrative of this part of the subject. The supply of flint, or its hornstone and chert equivalents, was inexhaustible; and its natural fracture and cleavage resulted in forms which frequently required little labour to convert them into useful household implements. The examples thus far figured were obtained directly from the Flint Ridge pits; but equally characteristic specimens lie intermingled with the finished axes and arrow-heads turned up by the plough, or recovered from the mounds. In the example figured here (Fig. 7), from

the original ploughed up in Sharon Valley, Licking County, Ohio, in the vicinity of a large mound, the reader cannot fail to recognise an analogy to a familiar class of implements of the drift.

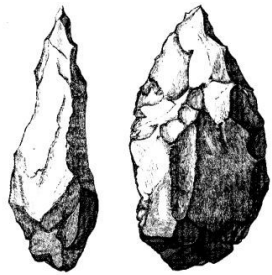


FIG. 7.—Leaf-shaped Flint, Sharon Valley, Ohio. (2/3).

The Shawnees, who last occupied the region now referred to, were a numerous and warlike tribe, who according to Indian tradition had come from Georgia and West Florida into the Ohio Valley. But they became involved in the French wars, joined in the famous conspiracy of Pontiac in 1763, and were nearly exterminated in a battle fought within two miles of the city of Newark. To them must, no doubt, be ascribed many of the flint and stone implements so abundant in the neighbouring valleys, as well as the partially worked flints in the numerous pits along Flint Ridge. But the material for the largest implements is here inexhaustible; and the natural lines of conchoidal fracture equally controlled the workmanship of the Troglodyte of the Drift, and the most recent Shawnee or Chippewa arrow-maker.

In the great mounds which abound throughout the region watered by the Ohio and its tributaries, delicately-wrought knives and arrow-heads, prized axe-heads, plummets and hemispheres of hæmatite, elaborately carved pipes, and even pins and bodkins of bone, lie buried along with the largest lanceolate

and oval-shaped flints; or blocks of the same material, rough-hewn, as brought from the pits. A general and well-founded idea prevails that the old Mound-Builders, and, in some cases also, the modern Indians, were in the habit of making caches of flint-blocks, so as to protect the material from exposure to the atmosphere. The modern English gun-flint makers entertained the same idea, believing that a certain amount of moisture present in the flint was necessary for working it with ease, and that it lost this by long exposure. Professor J. W. Powell, in his report of explorations of the Colorado of the West, made in 1873, thus describes the method pursued by the Colorado Indians in the manufacture of their stone implements: "The obsidian, or other stone of which the implement is to be made, is first selected by breaking up larger masses of the rock, and choosing those which exhibit the fracture desired, and which are free of flaws; then these pieces are baked or steamed, perhaps I might say annealed, by placing them in damp earth covered with a brisk fire for twenty-four hours; then with sharp blows they are still further broken into flakes approximating to the shape and size desired. For the more complete fashioning of the implement a tool of horn, usually of the mountain sheep, but sometimes of the deer or antelope, is used. The flake of stone is held in one hand, placed on a little cushion made of untanned skin of some animal, to protect the hand from the flakes which are to be chipped off, and with a sudden pressure of the bone-tool the proper shape is given. They acquire great skill in this, and the art seems to be confined to but few persons, who manufacture them, and exchange them for other articles."[36] No doubt some of the simple bone implements found in the mounds were used for this

purpose. I was shown recently, in Cincinnati, some well-made arrow-heads, the work of Dr. H. H. Hill, who informed me that his sole implement was the bone handle of a tooth-brush.

Among the many interesting disclosures due to the researches of Messrs. Squier and Davis, was the discovery in a mound of "Clark's Work," one of the largest earthworks in the Scioto Valley, of what may fairly be regarded as a magazine of such flint-blocks, fresh as from the quarry. Many of them are half a foot in length, but they vary in size and shape. Out of an excavation six feet long by four wide, nearly six hundred were taken. They lay regularly stacked, edge-ways, in two layers, one above the other; and the explorers estimated that the whole deposit might amount to four thousand discs of hornstone, roughly prepared for future manufacture.

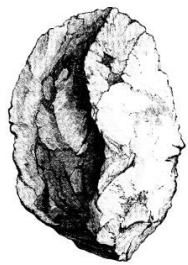


FIG. 8.—Flint Implement, Licking County, Ohio. (1/1).

Blocks of flint from ten to twelve inches in length, fashioned in like manner into the nucleus of a lance or spear-head, have occurred from time to time in Denmark, France, and Belgium; and are to be looked for elsewhere: since implements of flint are common in many localities where the material out of which they are fashioned is wholly unknown. Those are rightly conjectured to be the raw material, which, like pig-iron, was thus ready to be turned to the

special uses of the artificer. No doubt, by barter and traffic in various ways, such material for the flint-workers of Europe's and America's different stone periods was disseminated from centres where native flint occurs; just as in the later copper and Bronze periods of both continents the prized metals were diffused through remote areas. But it is only in localities where the flint abounds that implements, or even blocks or nuclei, of the largest size are of common occurrence. Fig. 8 represents one of the class of smaller rudely shaped flint implements recovered from a large mound in the vicinity of Newark. It indicates, alike in the discoloration and the change of the dulled surface, characteristic evidences of considerable antiquity. Thus buried in the mounds, or scattered about in the furrows of every ploughed field, slender flint-chips, knives, or spawls, with arrow-heads, axes, and other relics both of the Mound-Builders and their Indian successors, abound. The huge rough-hewn block of flint or hornstone takes its place as fittingly beside the delicately finished implements, as the prized lump of unwrought hæmatite, the large pyrula, or even the mass of copper or galena. Possibly they were deposited in the sepulchral mound to furnish to the dead the materials from which to fashion implements adapted to the new life on which he was about to enter. More probably, however, they were laid there simply as part of the ordinary furnishings adapted to the daily experiences of life. But if the Palæolithic tool-maker fashioned anything akin to the more delicate implements, the vicissitudes of diluvial and other geological changes have left few and partial illustrations of such finished handiwork of the Drift-folk. Their cave-dwellings did indeed admit, under specially favouring circumstances, of the occasional

preservation of bone implements, the smaller knives and lances of flint, and other comparatively delicate objects used in indoor work; and the value of these as illustrations of the habits and usages of the ancient Troglodytes can scarcely be exaggerated. But even those owe their preservation to processes akin to that which fractured and dispersed the fragments of the Brixham Cave implement; and which, in the more violent rearrangement of the river-gravels, must have generally reduced any carved bone or delicately worked flint to indistinguishable fragments. The exceptions indeed are exceedingly rare of finding in the gravel-beds a single bone of any animal so small as man.

The caves also undoubtedly embody in the contents of their silt and stalagmite the industrial implements of a later period than that of the river-gravels; and, as in the case of Kent's Cavern, even preserve the evidence of a succession of occupants belonging to distinct eras, and probably to essentially diverse races of men. But it is only in exceptional cases of special interest that the cave-drift discloses traces of actual habitation, the refuse heaps of the kitchen, the broken or stray tools, and even the flint-cores, hammer-stones, and flint-chips, which indicate the workshop of the ancient tool-maker. Mr. Evans figures hammer-stones of various kinds, made of diverse pebbles and of chipped flint; and others from the French caves consist of flint-cores with the prominent surfaces worn round by their use as hammer-stones in the process of chipping the flint into the desired forms. One of this class of implements now in my possession, of light grey flint, and bearing manifest traces of long use, was turned up in a ploughed field in Licking County, Ohio. Another example in my collection was presented to

me by Mr. W. L. Merrin, who picked it up in the vicinity of one of the pits on Flint Ridge, among the broken flakes and nodules which showed where the old flint miner had been at work. The cave deposits embedded animal remains and human implements in part by the same processes which in neighbouring river-valleys were burying the works of man alongside of the bones of the largest fossil mammalia. In the former, at times, the silting up was by a process sufficiently gentle to preserve unharmed the minuter traces of the cave-dweller and his arts; but as a rule there have remained to us from that remote Palæotechnic era, only the larger and ruder implements, corresponding as it were to the axe of the woodman, and the mattock or plough of the field labourer, which were alone capable of withstanding the violence of floods, and the like elements of geological reconstruction.

Enough survives to us, from the disclosures of a different character in the actual cave-dwellings of the Men of the Drift, to confirm the idea that we have as yet obtained a very partial glimpse of the arts of that remote dawn; and that we may watch with interest every fresh disclosure calculated to lessen the wonder excited by the large lanceolate or ovate worked flints of that era: rude enough at times to be ascribed to some irrational Caliban, rather than to a human artificer. It may perhaps be thought that I have yielded too ready credence to a fanciful analogy; but as I explored the deserted flint pits of the Shawnees, and the ancient quarry of the Ohio Mound-Builders, or picked up in the furrows of their desecrated earthworks huge half-formed ovate and spear-shaped blocks of hornstone akin to those of the European drift, it seemed to me like a glimpse of light illuminating the obscurity of that remote dawn.

The whole region of Ohio and Kentucky is rich in remains of the old flint-workers. In the Granville, the Cherry, Sharon, Hanover, and other valleys around Newark, in the vicinity of Dayton, and at Fort Ancient, in Warren County, Ohio, all of which I had special facilities for exploring, as well as in numerous other localities throughout the State, flint and stone implements abound. In Cincinnati I examined large collections, chiefly obtained by searching along the banks of the Ohio and its tributaries after the spring floods. Occasionally fine specimens may be observed *in situ*, projecting from the eroded bank, at a depth of about twenty inches from the surface; but the greater number are picked up in the silt and gravel left by the falling river, while many more must be buried in its bed: to form, perchance, a subject of study for future generations, in the reconstructed river-valleys of a newer world. Their number indeed is astonishing, in the contrast which the virgin soil of the New World thus presents to the rare traces of Europe's neolithic arts. One enthusiastic collector, Dr. Byrnes, of Cincinnati, told me that his most successful gleaning had been at a point near the junction of the Little Miami and Ohio rivers, where in one day he found upwards of seventy stone implements of various kinds, exposed by the ice and spring floods, on the river banks.

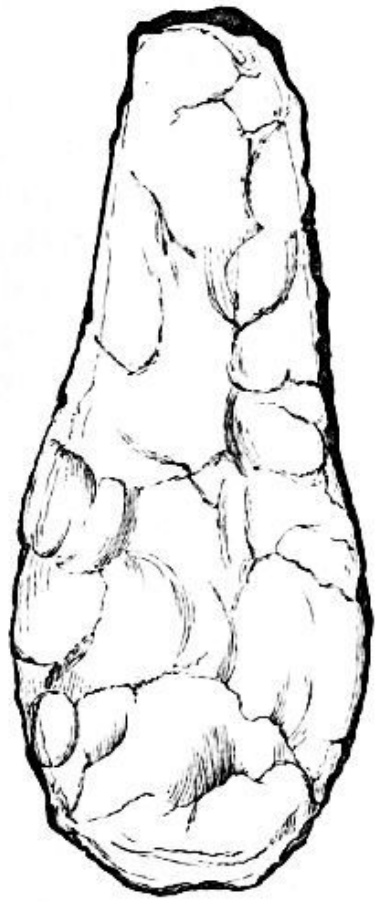


FIG. 9.—Flint Hoe, Kentucky. (1/3).

Many of the flint implements are finished with exquisite delicacy, to the finest serrated edge; while, no doubt owing to the abundant material, they are frequently on a scale considerably surpassing those of the European neolithic period. In the collections of Dr. Hill, Dr. Byrnes, and Mr. Hosea, of Cincinnati, I made drawings of flint-knives, spear-heads, and hoes, measuring nearly eleven inches in length. Fig. 9 shows an example of the latter implement, reduced

to one-third, linear measure. It was found by Dr. Hill, on the river edge of the Ohio, near Smithland, Kentucky, and fully illustrates the character of the flint hoe. The broad end has been worked to an edge, and is fractured from use; while the narrow end terminates in a flat unworked surface, showing the natural texture of the nodule from which it has been made. The same collections above referred to include spear-heads of dark hornstone, from 6½ to 7 inches long, of which upwards of fifty were found on a farm in Casey County, Kentucky. On another farm in Jackson County, Indiana, the owner's curiosity was excited by the large size of two or three spear-heads of dark grey hornstone turned up by the plough; and on digging down he found about ninety stacked edge-ways, one tier above another. Specimens of them examined by me in different collections measured from 4½ to 5 inches long. One of the smallest of them is figured here full size, Fig. 10. Along with some of these large spear-heads, Dr. Hill produced several beautifully finished leaf-shaped blades, chipped to a fine edge, measuring upwards of 5 inches long. They are worked in a pale grey hornstone speckled with white. Twelve of these were ploughed up in a level between two large mounds, near Brookville, Indiana; and ten perfect, with numerous broken specimens of a rarer type of large arrow-head, equally well finished, were found in the vicinity of another mound, near Anderson's Ferry, a few miles below Cincinnati. The number of such implements in this region is astonishing; and frequently the beauty of a piece of milky-quartz, yellow chert, or pure rock crystal, appears to have stimulated the workman to his utmost dexterity in the manufacture of serrated, dentated, and elaborately finished blades of various forms.

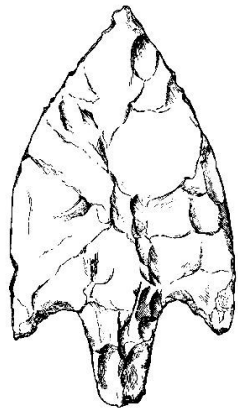


FIG. 10.—Flint Spear-head, Indiana. (1/3).

In the collections I have named, as well as in those of Mr. Cleneay and Mr. James of Cincinnati, and of Mr. Merrin and Mr. Shrock of Newark, the examples of flint and stone implements number many hundreds, and would require a volume not less ample than Mr. John Evans's comprehensive monograph of *The Ancient Stone Implements, Weapons, and Ornaments of Great Britain*, to illustrate their details. I shall limit myself here to a few examples selected from among those peculiar to the neolithic art of the New World which offer any suggestive hint relative to the origin or use of objects already familiar to the archæologist. Perforated teeth of bears and other animals occur among the mound relics; shell beads are still more abundant; bone and horn pins and lance-heads, and a peculiar class of stone implements, most frequently made of a striated, grey or blue shale, perforated with two or more holes, are all of common occurrence. The chief varieties are shown in the *Ancient Monuments of the Mississippi Valley*, Fig. 136, p. 237. Some of them bear so near a resemblance to the bracers, or guards, found in British graves, and supposed to have been

worn on the left arm to protect it from the recoil of the string in the use of the bow, that I am inclined to ascribe the same purpose to them. But others are curved at the edges, and frequently of too large a size for this purpose. The latter are also occasionally formed of copper. One example of this class of implements, or personal decorations, obtained from the Lockport mound, and now in the possession of Mr. Merrin, measures 5·30 by 3·80 inches.



FIG. 11.—Flint Awl, Mayville, Kentucky.



FIG. 12.—Flint Drill, Cincinnati.

The frequent occurrence of drilled and perforated stone and shell implements, tubes, pipes, etc., accounts for the finding of a variety of awls, or drills, made of flint and stone. Not only perforated shell-gorgets, stone tablets or guards, plummets, and the like relics, but also beads, bears' teeth, and other pendants or personal ornaments of various kinds, have been found in the mounds. They correspond to some extent to a class of perforated shell and bone implements met with in the ancient cave deposits of France and England; and the flint awls or borers by which they were drilled have been recognised among the rarer objects of the neolithic period found in England, France, Denmark, and in the Swiss Lake-dwellings.[37] Figs. 11, 12 are good examples of two

types of such tools in use by the ancient flint-workers of the Ohio Valley. Fig. 11 was found by its present owner, Mr. James Pierce, near Mayville, Kentucky. The square butt which forms the handle retains the natural shape of the block of yellow chert of which it is made, while the chipped surfaces of the blade show the dark grey colour of the core. Fig. 12 is a larger and ruder example of the flint drill, from the collection of Dr. Hill, of Cincinnati, probably designed to be attached to a wooden haft, and used for operations on a larger scale. A more carefully finished small flint-awl, with a neatly worked handle, but unfortunately broken at the point, was presented to me by Mr. Merrin, of Newark, who picked it up in a field in that vicinity. A drill of a different kind is shown in Fig. 13, also from the collection of Dr. Hill.



FIG. 13.—Stone Drill, Cincinnati.



FIG. 14.—Flint-Knife, Cincinnati.

It is of diorite, and at the first glance might be taken for a stone arrow-head. But it is worn perfectly smooth along its two edges, especially towards the point, evidently from continuous use in the perforation of some hard substance, such as might result in the hollowing out of the bowl of a stone pipe: though such an instrument would be called into use in many operations of the old flint-workers. Knives and razors of diverse forms, and some of them finished with great care, at times in very fantastic

shapes, are also of frequent occurrence. Their unusual shapes are probably in part due to the chance fracture of the flint-flakes, specimens of which abound in the pits on Flint Ridge, frequently requiring little manipulation to convert them into cutting implements. Fig. 14 is a small knife of this class, selected from several in the collection of Dr. Hill. It is made of yellow chert, and has a keen cutting edge. But there is another class of flint-knives not unfamiliar to European archæologists, of which interesting examples occur. A good American specimen of the flint-core, such as has been found in Kent's Cavern, and elsewhere on British sites, and is common among the neolithic relics of Denmark, is now in my possession. It was picked up in the Granville valley, Licking county, Ohio, not far from the famous Alligator Mound; and shows the facets from which long curved flakes have been struck off. The curved form which the flake naturally assumes is frequently retained in the finished implements, along with three facets, forming an acute triangular blade, coming to a sharp edge.



FIG. 15.—Flint Razor, Kentucky.

The Mexican obsidian is characterised by the same fracture; and some of the early Spanish writers enlarge on the keenness of the edge of the obsidian razors, as scarcely inferior to those of steel, though they speedily lose their edge. A good example of the flint razor is shown in Fig. 15, from the collection of Mr. James Pierce of Mayville, Kentucky. It is one of the outer flakes of the core, coming to a good edge on the one side, and chipped to a broad back. Fitted

with a wooden haft, it would form a convenient cutting implement for many purposes. It is shown here nearly 5-6ths of the original size. The natural cleavage of the flint, thus controlling the forms which the fractured nodules assume, has tended to beget certain classes of implements common to all the stone periods of which we have any trace, from the palæolithic era of the drift and cave-men to that of the flint-workers among savage tribes of our own day. Horse-shoe, pear-shaped, oval, discoidal, and other scrapers abound among the more familiar implements of the old American flint-workers, reproducing all the forms common to the early stone periods of Europe, and which have been minutely illustrated by Mr. Evans.[38] But there is another type of scraper, of a more finished character,

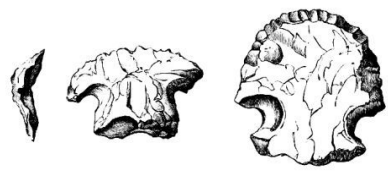


FIG. 16-17.—Flint Scrapers, Ohio.

which frequently occurs among American flint implements, of which I am not aware that any example has hitherto been noted in Europe. In its more common form it might be mistaken at the first glance for a broken arrow-head. But the repeated occurrence of examples of this type, with the well-finished edge invariably inclining, with a curve, to the one side, leaves no room for doubt as to its purpose as a scraper, designed to be fastened to a haft, and used for fashioning needles, bodkins, lance-heads, and other implements of ivory, bone, or horn. This type is shown in Fig. 16, picked up in the

neighbourhood of Newark. Fig. 17 is another common form, with the edge wrought to one side, but with slighter curve, or inclination otherwise to the side. Both of these are figured the full size; but many specimens occur of larger sizes, and varying curves of the blade, from a long horse-shoe to a broad crescent shape. There are also arrow-heads of analogous forms, but with no curve in the blade. Similar arrow-heads are now made by the Blackfeet Indians out of iron hoops obtained from the Hudson Bay fur traders, and it is said that with those a skilful marksman will behead a bird on the wing. Others of the rarer forms of flint implements include foliated, flamboyant, or fantastically-shaped arrow-heads, and the like implements, of which an example is shown in Fig. 18, and for which it is difficult to assign any specific use. Some of them, indeed, look like the sports of an ingenious workman tempted by chance forms of the fractured flint to try his hand at some fanciful knife, arrow-head, or other implement of unwonted design.

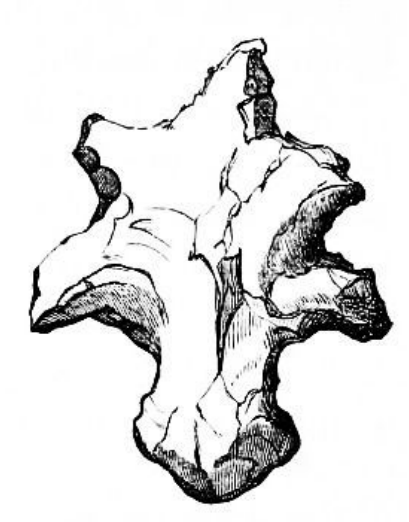


FIG. 18.—Foliated Arrow-head.

Discoidal stones, somewhat varying in form and size, are common in the valley of the Ohio, and throughout the Southern States. Messrs. Squier and Davis figure two examples found by them along with an unusually rich deposit of choice relics, including several coiled serpents carved in stone, and carefully enveloped in sheet mica and copper, under a mound within the great earthwork of Paints Creek. The discoidal stones found there are made of a very dense ferruginous stone, of a dark brown ground interspersed with specks of yellow mica. Others are of granite, porphyry, jasper, greenstone, and quartz, sometimes with concave surfaces, or perforated with a funnel-shaped hollow on either side; but always of a hard stone, and highly polished. One fine specimen in the collection of Dr. Byrnes is of polished novaculite, and another of quartz. The largest are about six inches in diameter, and are generally finished with great symmetry. There is no doubt that such implements were employed among the Southern Indians, subsequent to their being visited by Europeans, in certain favourite games. Adair describes their use; and adds that they were so highly valued "that they were kept with the strictest religious care from one generation to another; and were exempted from being buried with the dead." It may be that in some of them we have implements used in the games which formed a prominent part in the sacred festivities, for which it is assumed that the great geometrical earthworks were constructed. Indeed the perfect symmetry of form in the majority of this class of relics seems to accord with the idea of their having been fashioned by the race who have left such gigantic memorials of their regard for geometrical configuration. One perforated discoidal

stone, of polished granite, which I examined at Cincinnati, was dug up by Dr. J. H. Hunt, within a large earthwork at Cleves, near the great Miami River; and another in the possession of Dr. Byrnes was found in the vicinity of one of the great mounds on the Ohio.

Among the rarer stone implements which occur among the relics of Europe's neolithic arts are certain objects which, though of small size, otherwise so closely resemble the most highly finished mining hammers that they have been generally designated hammer-stones. A more careful and discriminating study of them, however, has led to the assignment of them to a totally different purpose. An example found near Ambleside, Westmoreland, and figured in the *Archæological Journal*,[39] shows a well-finished ovoid implement of stone, with a deep groove round the middle. Others have been repeatedly found in the neighbourhood of the English lakes, as well as in other localities; and as they show no traces of being battered or worn from use in hammering, and are frequently made of sandstone or other material unsuited for such a purpose, they are now generally regarded as sinkers for nets or fishing lines. Objects of nearly similar form, but most frequently made of diorite, granite, or other equally hard rocks, occur among the stone implements of the Ohio Valley. Many of them measure from 3 to 4 inches long. But while in them also the absence of any marks of abrasion or battering serves to show that they were not used as hammers, a hard and heavy material appears to have been preferred in their construction. Hence it has been surmised that they were the weights attached to a hunting thong, or lasso; though they would equally serve as sinkers for the fisherman's nets. One of them, from a mound in

Kentucky, is shown in Fig. 19. It is of granite, and carefully finished, but a hard siliceous concretion at one end has resisted the efforts of the workman to reduce it to perfect symmetry. The attempt to determine the uses for which implements were made, under circumstances so wholly different from everything we are familiar with, is at best guesswork. But it seems unlikely that so much labour and skill would be expended in fashioning such intractable material into symmetrical shape for a mere net-sinker. In the collection of Mr. Merrin is a large implement of the same form, weighing fully eighteen pounds. It was found on the site of the Lockport Mound, at Newark, along with numerous other stone, shell, mica, and copper relics. Its size and weight at once suggest the idea of its use as a miner's maul; but it is made of sandstone, and retains no traces of use as a hammer. It is equally inapplicable for the hunter's lasso and the fisher's net; and if designed for a weight, must have been for some very different purpose.

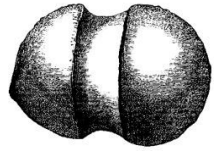


FIG. 19.—Lasso Stone, Kentucky.

Among various novel relics of the Ohio Valley which attracted my notice from their resemblance to others familiar to European archæologists, was a class of cupped stones, very abundant in many localities. In 1867 Sir James Y. Simpson published an elaborate and nearly exhaustive disquisition on "Archaic stones and rocks in Scotland, England, and other countries"; and about the same time Algernon,

Duke of Northumberland, undertook the illustration of the same class of relics in his own district. The work was projected on a large scale, and did not appear till after his death, when a large imperial folio was produced, entitled "*Incised Markings on Stone found in the County of Northumberland, Argyleshire, &c.*" The simplest types of this class of archaic sculpturings consist of rounded depressions, or "cups," formed in the surface of rocks and standing-stones, and varying from 1 to 3 inches in diameter. Those are scattered irregularly over the surface. But another class has the cups surrounded by concentric rings, and with lines leading from one group to another, with so much apparent system as to have suggested the idea of their being specimens of primitive chorography, not unlike the delineations which I have seen made by an Indian on a bit of birch-bark, in order to indicate the geography of a locality. They have, in fact, been supposed to be maps, whether of the Celtic Britons, or of some older people, and to represent the chief towns, or intrenched strongholds, and neighbouring villages or encampments, with the roads leading from one to another. But while the cup-like hollows constitute their main features, the accompanying linear marks vary sufficiently to afford antiquarian fancy and conjecture ample scope in assigning their origin or use. They have accordingly been described as Phœnician, Druidical, Mithraic; as originating in the worship of Baal, or of the Persian Sun-god; as the blood-focuses of Druid altars; emblems of female Lingam worship; Sabean astronomical devices; or as in some way or other recognisable as possessing a sacred or religious character.

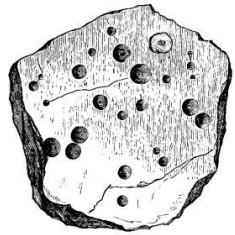


FIG. 20.—Cupped-stone, Ohio.

Attention had not been long directed to the cup sculpturings in Britain, when Professor Nilsson reported their occurrence on Scandinavian standing-stones; Dr. Keller recognised their presence on the rocks and boulders of Switzerland; and now it appears that they are no less common in Ohio and Kentucky, and extend southward into Georgia and other states of the Gulf. Fig. 20 represents a cupped sandstone block on the banks of the Ohio, a little below Cincinnati. Others, much larger, were described to me by Dr. Hill. One above Mayville has thirty-nine cups, and another, close to the river's bank, eighty of the same characteristic hollows, with other linear and circular carvings. Mr. Charles C. Jones figures, in his *Antiquities of the Southern Indians*, a sculptured boulder of fine-grained granite in Forsyth county, Georgia, which in more than one respect is the precise counterpart of ancient British ring and cup sculpturings. Like the cap-stone of the Bonnington Cromlech, the Old Bewick block described by Sir J. Y. Simpson, and the Lancresse Cromlech in the Channel Islands: the Georgia boulder has a row of cups, or drilled holes, running along one side, while its surface is indented with cup-like hollows from a half to three-quarters of an inch deep, with concentric rings and connecting lines closely resembling the sculpturings on some of the ancient Scottish stones. In Georgia they are assumed

to be the work of the Cherokees; but Mr. Jones adds: "No interpretation of these figures has been offered, nor is it known by whom or for what purpose they were made."[40] But besides the large rock sculptures, numerous small stones occur in the ploughed fields with similar cups wrought in them. They are mostly of rough-grained sandstone, frequently with several holes irregularly disposed on more than one surface; and closely corresponding to examples figured by Dr. Keller, some of which were procured from the lake-dwellings of Neuchâtel. I gathered several specimens, and could have obtained many more on Ohio farms, including both the smoothly hollowed cups, from one to two and a half inches in diameter, and those where the hollow is roughly picked out, or only partially worn into a smoothly rounded cup. Some of those examples were found in neighbouring fields, while engaged in excavating the Evans Mound, in Sharon Valley, near Newark, where also I obtained both polished axes and mullers. The cupped stones were of a coarse-grained sandstone, with the depressions occurring irregularly on both sides, and occasionally so close as to run into each other. Into these the rounded ends of the stone axes and pestles fitted, and the two classes of objects seemed complements of each other. Here was the roughly picked hollow, gradually worn into a smooth rounded depression, in the process, as I conceive, of grinding the ends of stone axes, maize-crushers, pestles, and the like implements, some of which fitted exactly into the cups. As the hollow gradually wore too large, a new one was made. The edges of the smaller cup-stones also frequently show evidence of their use in grinding down the surfaces of such stone implements. Such, however, is not the theory which finds favour in the Ohio Valley. There

the hickory, or native walnut, abounds, with its hard shell, defying all ordinary efforts to reach the tempting kernel. But the boys have learned to hunt up a cupped stone, and placing the nut in its hollow, it is fractured at a blow with another stone, and its contents secured. Hence such objects are called nut-stones; and Mr. C. C. Jones, in his *Antiquities of the Southern Indians*, has adopted both the name and the idea implied in it, in spite of the occurrence of the same cups or depressions on rocks and boulders altogether inapplicable for such a purpose.[41]

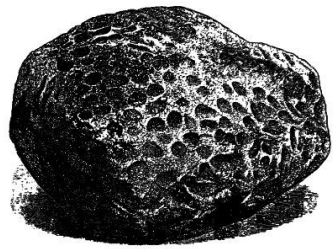


FIG. 21.—Cupped Boulder, Tronton, Ohio.

Whatever may have been the purpose of the cupped stones, they were not unknown to the ancient Mound-Builders. Messrs. Squier and Davis state that "in opening one of the mounds, a block of compact sandstone was discovered, in which were several circular depressions, in all respects resembling those in the work-blocks of coppersmiths, in which plates of metal are hammered to give them convexity." These accordingly they suppose to have been the moulds in which the copper bosses and discs were formed, of which numerous examples have been obtained from the mounds.

A highly characteristic example of what may not inaptly be styled a neolithic grindstone was found near Tronton, Ohio, in the summer of 1874. It is a large sandstone boulder, as shown in Fig. 21,

covered with cups, or pits; and also, as will be seen, with long grooves, which suffice to prove its use as a stone for shaping and polishing tools. This adds confirmation to the probable origin of the cups from a like cause. Since I drew attention to the subject, I have been informed of the discovery of numerous similarly indented and grooved rocks along the shores of the Ohio river, including some of the hard granite, or Laurentian boulders. But gritty sandstone rocks appear to have been preferred.

The supposition that the cups on large boulders and small sandstone grinders may alike be referred to the manipulations of the stone tool-maker, leaves the more elaborate accompaniments of concentric rings and linear devices unaccounted for; though it seems to me less improbable that these additions—which are thus found among other traces of the Cherokees and Shawnees of the new world, as well as amid the remains of Europe's prehistoric races,—may be no more than supplements of an idle fancy added to the hollows which originated in the needful grinding of flint and stone implements into their required forms, than that they are mysterious religious symbols. Yet there is a fascination in the idea that they are "archæological enigmas": Phœnician, Mithraic, Sabean, or Druidical; "lapidary hieroglyphics and symbols," as Sir J. Y. Simpson assumes, "the key to whose mysterious import has been lost, and probably may never be regained."[42] "They are," he again says, "too decidedly 'things of the past' for even the most traditional of human races to have retained the slightest recollection of them"; and, as in his attempt to determine the race to which to refer them he follows up the glimpses of their occurrence beyond the British Isles, he asks: "Are they common in countries which the Celtic race

never reached? still more, are they to be found in the lands of the Lap, Finlander, or Basque, which apparently neither the Celt nor any other Aryan ever occupied? Do they appear in Asia within the bounds of the Aryan or Semitic races? Or can they be traced in Africa, or in any localities belonging to the Hamitic branches of mankind? Do they exist upon the stones or rocks of America or Polynesia?"[43] If my theory is correct, they may be looked for in all. It is with tender memories of a dearly valued friend that I render the response, that such sculptured cups do exist upon the stones and rocks of America, and amply justify the reference of those of the Old World to Europe's neolithic age, when the men of its polished Stone Period were grinding and working into perfected form the most prized relics of their laborious art.

The explanation thus derived from the traces of America's native savage arts, in possible elucidation of a class of archaic European sculptures which have been made the subject of such learned speculation and research, may seem too artless to be substituted for theories of religious symbolism or rites of worship. But the ancient evidences of artistic labour in either hemisphere accord with the idea that man's earliest arts were of the most practical kind. He did, indeed, find leisure to ornament the tools designed for common uses; and gave play to his imitative faculty in drawings and carvings which answered no other end than the pleasure the draughtsman in all ages has derived from the manifestation of his skill in the arts. But the grafting of recondite theories of symbolism and ritualistic devices either on such delineations, or on the simpler evidences of his handiwork, is apt to lead us astray into fanciful and profitless speculations, wholly apart from the true

significance of such traces of primitive mechanical ingenuity as reveal the presence of man even on the skirts of ancient glaciers, and among the drift-gravels, of Europe's post-pleiocene dawn.

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[33] *Archæologia*, vol. xlii. p. 68.

[34] *Journ. Ethnol. Soc. N.S.*, vol. ii. p. 419.

[35] *Journ. Geol. Soc. Lond.*, vol. xvii. pp. 322, 368; vol. xviii. p. 113, etc.

[36] *Report of Explorations of the Colorado of the West and its Tributaries*, p. 27.

[37] *Ancient Stone Implements of Great Britain*, p. 289.

[38] *Ancient Stone Implements of Great Britain*, pp. 270-277.

[39] *Archæol. Journ.*, vol. x. p. 64.

[40] *Antiquities of the Southern Indians*, p. 378.

[41] *Antiquities of the Southern Indians*, p. 315-320.

[42] *Archaic Sculpturings*, p. 92.

[43] *Ibid.*, p. 147.

CHAPTER IV.

BONE AND IVORY WORKERS.

BONE AND IVORY WORKERS—SUBSTITUTES FOR FLINT—PROOFS OF RELATIVE AGE—DOMESTIC BONE IMPLEMENTS—RUDE PALÆOLITHIC ART—WHALEBONE WORKERS—PRIMITIVE WORKING TOOLS—FISH-SPEARS AND HARPOONS—ARTISTIC INGENUITY—DRAWING OF THE MAMMOTH—THE MADELAINE ETCHINGS—RIGHT-HANDED WORKERS—DEERHORN QUARRY PICKS—BONE-BRACER OR GUARD—BIRTHTIME OF THE FINE-ARTS—INNUIT CARVERS OF ALASKA—TROGLODYTES OF CENTRAL FRANCE—POST-GLACIAL MAN—SYMMETRICAL HEAD-FORM—INTELLECTUAL VIGOUR—EVIDENCE OF LATENT POWERS—TAWATIN IVORY CARVING—LAKE-DWELLERS' IMPLEMENTS—CAVE IMPLEMENTS—ARTS OF THE PACIFIC ISLANDERS—CARIB SHELL-KNIVES—ABORIGINES OF THE ANTILLES—CARIBS OF ST. DOMINGO—CAVE PICTURES AND CARVINGS—PRIZED TROPICAL SHELLS—ANCIENT GRAVES OF TENNESSEE—SHELL MANUFACTURES—HURON AND PETUN GRAVES—SACRED SHELL-VESSELS—PRIMITIVE SHELL ORNAMENTS—AMERICAN SHELL MOUNDS—A SHELL CURRENCY—IOQUA STANDARD OF VALUE.

The nearest type which we can now conceive of to the Drift-Folk of Europe's post-glacial era is the Esquimaux. It is even possible that, like them, they may have occupied winter snow-huts; and only retreated to their cave-dwellings during the brief heat of a semi-arctic summer. Among a people so situated the industrial arts are called into utmost requisition, alike for clothing and tools; and the simplest experience of the hunter directs him to the produce of the chase for the most easy supply of both. The pointed horn of the deer furnishes the ready-made dagger, lance-head, and harpoon; the incisor tooth of the larger rodents supplies a more delicately edged chisel than primitive art could devise; and the very process of fracturing the bones of the larger mammalia in order to obtain the prized marrow, produces the splinters and pointed fragments which an easy manipulation converts into bodkins, hair-pins, and needles. The ivory of walrus, narwhal, or elephant is more readily wrought into

many desirable forms, and is less liable to fracture, than the intractable flint or stone; and all those materials are abundant in the most rigorous winters, when flint and stone are sealed up under the frozen soil. Tools and weapons of bone and ivory may therefore be assumed to have preceded all but the rudest stone implements; and although, owing to the indestructible nature of their material, it is from the latter that our ideas of earliest post-glacial art are chiefly derived, enough has been found in contemporary cave-deposits to confirm this inference from the analogous hyperborean arts of our own day.

Flint, indeed, though so widely used as the primitive tool-maker's material, is unknown in many localities. We are familiar with regions at the present time, where man not only subsists, but supplies himself with implements and weapons adapted to his need, though neither flint nor stone is available. This fact has been practically ignored in the accepted terminology of the science. As now reduced to system, it proceeds in retrospective order thus:—Historic, prehistoric, neolithic, palæolithic, with a possible protolithic period of still older geological epochs. An awkward misnomer inevitably results from this assumption of stone as the sole basis of primitive art: as where the archæologist speaks of palæolithic bone implements, or neolithic pottery. I have therefore substituted here the more comprehensive terms palæotechnic and neotechnic. They suffice equally for the classification of implements and personal ornaments of flint, stone, bone, ivory, or even of metal: as in the neotechnic gold and bronze work; and also for those made from marine shells. Many of the latter have been recovered under circumstances which establish their claim to be classed with other examples of primitive

art; and even find illustration among the rarer disclosures of the ancient cave-drift. In the great Archipelago of the Caribbean Sea, as well as in widely scattered islands of the Pacific Ocean, the primeval stage of native art might indeed be more correctly designated a shell period; for until their discovery by Europeans, the large shells which the mollusca of the neighbouring oceans produce in great abundance, furnished to the native artificers the most convenient and easily wrought material. For the natives of the coral islands of the Pacific especially, marine shells supplied the want not only of copper and iron, but of flint and stone; and left them at little disadvantage when compared, for example, with the Indians of the copper regions of Lake Superior.

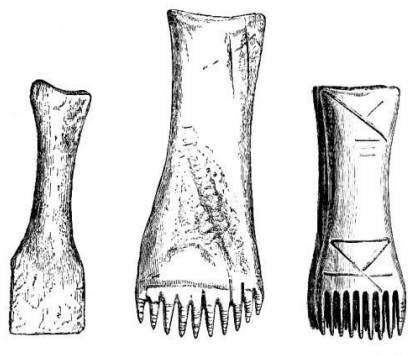


FIG. 22.—Bone Spatula, Keiss. FIG. 23.—Bone Comb, Burghar. FIG. 24.—Bone Comb, Burghar.

Alike in the ivory and bone carvings of the modern Esquimaux, and in the rare but invaluable evidences of primitive art furnished by those of the ancient Cave-Folk of the Dordogne and other oldest human dwellings, it is seen how favourable such easily wrought material was to the development of a

mechanical skill and artistic ingenuity such as must have lain dormant had the primitive artificers been wholly limited to flint and stone. The same result is traceable, though in a less degree, to the analogous material of the Islanders' shell-period. But implements and ornaments made of marine shells have a further interest from the evidence they occasionally afford of distant traffic, or interchange of foreign commodities.

Tools of horn, bone, and ivory possess a value of another kind. With them, as on a common ground, the palæontologist and the archæologist meet and determine the relative ages of the primitive artist and his materials. In the Glamorganshire cavern at Paviland Dr. Buckland found the skull of a mammoth, or other fossil proboscidian, and beside it the remains of cylindrical rods and armlets made from its ivory. In the famous Aurignac cave, on the northern slope of the Pyrenees, were arrows and other implements of reindeer horn, a bodkin fashioned out of the horn of the roedeer, and a tusk of the *ursus spelæus*, perforated and carved in imitation of the head of a bird. The Dordogne caves in like manner reveal the natives of Southern France in its old post-glacial era, hunting the aurochs and reindeer, and fashioning their horns and bones into lances, bodkins, needles, clubs, ceremonial or official batons, and other implements of varied purpose and design. Among the "prehistoric remains of Caithness," which rewarded the explorations of Mr. Samuel Laing in the mounds at Keiss, were numerous implements made from the horns and bones of the reindeer, red-deer, ox, horse, and whale. Some of them are of the rudest character; and all indicate a condition of life akin to that of the tribes of the Labrador, or the Alaska coast at the present day. Fig.

22 is a spatula roughly formed from the bone of an ox; unless, as Mr. Joseph Anderson has suggested, it be the first stage in the process of fabricating a comb, of the type shown in Figs. 23, 24. The latter, found at Burghar, in Orkney, is a precise counterpart of the long-handled combs still in use by the Esquimaux for separating the sinew-threads, which supply them with one important resource in making their clothing. Those relics point to times when the fauna differed even more than the men of this era from those of the present day. In the mounds of the Ohio Valley, on the other hand, the bone implements and animal remains appear to be referable to existing species; and so supply evidence in contradiction of the extreme antiquity assigned by some to the mounds and their builders. One special value of primitive tools of horn, bone, and ivory is thus manifest. They embody glimpses of truth in relation to climate, native fauna, culinary practices, and special objects of the chase; and to this easily worked material we owe disclosures of an æsthetic faculty, and of artistic capabilities pertaining to the Troglodytes of the Dordogne, to whom, but for such evidence, might, and probably would have been assigned a rank in humanity as far below the standard of the modern savage as the Patagonian or Australian falls short of that of the average European of our own day.

The artificial origin of many of the rudest of the worked drift-flints has been challenged. But of the human workmanship of the large flint implement found alongside of the bones of a fossil elephant in the quaternary gravels of the London basin, near Gray's Inn Lane; or of the spear-heads which lay under similar fossil bones in the drift of the valley of the Waveney, at Hoxne, in Suffolk, no doubt has ever

been suggested. Both were discovered upwards of a century before the idea of man's contemporaneous existence with the mammals of the drift had been mooted; but if such specimens of his art are to be made the sole test of human capacity in that primeval era, they might justify the idea of some lower type even than the wretched Patagonian or Australian. But contemporary cave deposits check our conclusions from such partial evidence; and suggest that in those rudest specimens of palæolithic art we have only the most indestructible relics of an epoch by no means destitute of inventive ingenuity or artistic skill.

All the cave deposits referred to were accompanied with human remains. In the Glamorganshire Cavern a female skeleton lay in close proximity to the skull of the fossil elephas, embedded in a mass of argillaceous loam. Adapting his deductions to the ruling idea which then guided the author of the *Reliquiæ Diluvianæ*, Dr. Buckland refers to the cylindrical rods and rings of ivory as "made from part of the antediluvian tusks that lay in the same cave; and," he adds, "as they must have been cut to their present shape at a time when the ivory was hard, and not crumbling to pieces as it is at present on the slightest touch, we may from this circumstance assume to them a high antiquity." Dr. Buckland's idea of the antiquity implied by such cave remains was very different from what is now universally accepted. But it is not to be overlooked that here, as in the Aurignac, and other sepulchral caverns, the interment may belong to an epoch long subsequent to that of the fossil mammals. The tusk of a mammoth from the Carse of Falkirk, now in detached pieces in the museum of the University of Edinburgh, was rescued from the lathe of an ivory-

turner; and the fossil ivory of Siberia is a regular article of commerce.

But in other examples of a like character we are left in no doubt. The deer's-horn harpoons of the whalers of Blair-Drummond Moss are unquestionably contemporaneous with the fossil whales; and although the implements are rude enough, they will class with harpoons and fish-spears here described, some of which have been found associated with works in bone and ivory of great ingenuity and skill. The Greenland whale undoubtedly haunted the northern shores of Scotland within historic times. Its bones occur in Scottish brochs and kitchen-middens; and among the many traces of prehistoric arts and habits of life disclosed by the contents of the Scottish subterranean dwellings, one of the most interesting is a large drinking-cup fashioned from the vertebra of a whale. It was found in a weem on the Isle of Eday, in Orkney, along with a bone scoop, bone pins, combs, and other primitive relics, including some of metal. The cup measures 4½ inches high; and, as shown in Fig. 25, is a very simple adaptation of the natural form of the bone by sawing off the protruding spinous processes.



FIG. 25.—Whale's Vertebra Cup.

The ancient workman had his knife, saw, adze, chisel, drill, and scraper,—or plane, as we may term it,—all made of flint. The worn and triturated edges of many of those flint-tools show abundant evidence of their use in fashioning some hard substance. He had also his file, made of grit-stone; of which various examples have been found in the caves. They are generally styled whetstones; but their purpose was probably the very same as that of a modern file. Some are of coarse-grained stone, and others of a finer grit. Without some such tools it would have been impossible to bring the more elaborate implements of bone and ivory to the state of finish which they present. Among such, the harpoons and fish-spears furnish a variety of types, diversified by the ingenuity of the workman, and the necessities of his craft. Examples of such primitive fishing implements of widely different eras are here grouped together. The three-pronged fish-spear, Fig. 26, illustrates the art of the Esquimaux fisherman: that

living race of Arctic seas, which alike in arts and in condition of life, realises for us in so many ways the men of Europe's post-glacial age. Alongside of it are a hook, or spear-head of deer's-horn, Fig. 27, and a barbed fish-spear of the same material, Fig. 28, both the work of the ancient Lake-dwellers

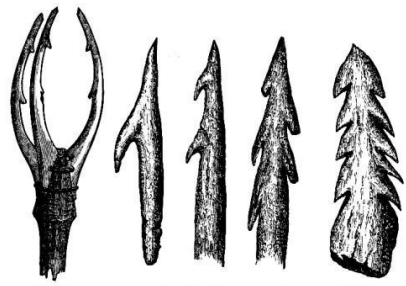


FIG. 26-30.—Fish-spears and Harpoons.

of Neuchâtel. They present interesting analogies to the most familiar types of bone or ivory fish-spears of the French and English post-glacial era, of which Figs. 29, 30 are examples from the Dordogne Caves. Fig. 31, though worn and fractured, illustrates a form of the cave harpoon-blade, barbed only on one side. It is from Kent's Cavern, where other, though less perfect, examples have been found. One of these, figured by Mr. Evans,[44] is specially noticeable for its curved form. Similar implements have repeatedly occurred in the cave-deposits, as in those of the Dordogne, and at Bruniquel, where also serrated flints or saws were found in unusual abundance. Fig. 36, from the cave of La Madelaine, is a good example of the unilateral fish-spear, much superior in workmanship to the similar implement of the modern Fuegian, shown in Fig. 33, and well adapted to the wants of a river-fisherman. But the form of the Kent's Cavern type rather suggests that it was one of

the blades of a large two-pronged, or three-pronged spear, similar to examples still in use among the Esquimaux:



FIG. 31.—Harpoon, Kent's Cavern.



FIG. 32.—Bone Spear-head, Dordogne Caves.



FIG. 33.—Fuegian Harpoon.

of which one, now in the museum of the University of Toronto, shown in Fig. 26, illustrates the probable design of the curved blades. In the caves of the Dordogne and Garonne valleys repeated discoveries of bone needles, in association with the barbed fish-spear, have been noted. They are objects of delicate manipulation, the value of which is proved by the occurrence of examples accidentally broken, and drilled with a new eye. The caves of the Dordogne pertained, even in the remote era of the mammoth or reindeer periods, to a race of inland hunters and fishermen to whom such a harpoon would have been cumbrous, if not wholly unsuited to their requirements. But the Kent's Hole Troglodyte had probably more formidable prey to encounter, and so adapted the implements of the chase to his special requirements. Of the bilateral barbed fish-spear, a good, though imperfect example is shown, the natural size, in Fig. 32, from Laugerie Basse, in the Dordogne. Another, Fig. 34, was found imbedded in the red cave-earth of Kent's Cavern, underneath a bed of black earth, containing flint-flakes and bones of extinct mammals, over which the stalagmitic

flooring had accumulated to a thickness of a foot and a half. Similar implements have been recovered from other Dordogne Caves. Fig. 35, from La Madelaine, is a variation of the latter type, in which the barbs are disposed alternately on either side.



FIG. 34.—Fish-spear, Kent's Cavern.



FIG. 35.—Fish-spear with bilateral barbs, La Madelaine.



FIG. 36.—Fish-spear with unilateral barbs, La Madelaine.

It is alike interesting and highly suggestive of the characteristics of man as a rational being, thus to find his ingenuity, when stimulated by similar necessities, begetting closely analogous results in ages separated by intervals so vast that we vainly strive to measure them by any standards of historical chronology. But the ingenuity manifested in the construction of his fishing and hunting gear very inadequately reveals to us the aptitudes of the men of the drift or the cave periods. In those remote epochs, as now, man was an intelligent being, gratifying his taste in many ways by works often involving great labour, and leading to no other practical results than many labours of the carver and house-decorator, the painter, sculptor, and engraver of our own day. Among the works of art, for example, of the cave-men of the Dordogne, contemporary with the mammoth and the reindeer of Central France, various incised drawings of animals, executed both on bone and slate, apparently with a flint stylus or graver, have excited an unusual interest. They include representations of the fossil

horse, as on a carved baton, or mace, Fig. 37; of the reindeer, in groups, and engaged in combat; of the ox, fish of different kinds, flowers, ornamental patterns, and some ruder attempts at the human form. Carvings in bone and ivory illustrate the same ingenious mimetic art. But the most remarkable of all is the portraiture of the mammoth, Fig. 38, outlined on a plate of ivory, and to all appearance drawn from the life. It represents the extinct elephant, sketched with great freedom and even artistic skill; and not only compares favourably with the best specimens of modern savage delineation, but exhibits so much freedom of handling as to look more like the sketch of an artist skilled in the use of his pencil. I can recall no example of savage art exhibiting such freedom; and none but an experienced draughtsman could execute with pencil or etching-needle anything approaching to the expression and character given by means of a few lines, executed with no laboured effort, but evidently dashed off by one who had full confidence in his powers.

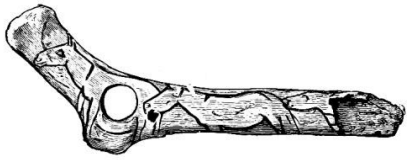


FIG. 37.—Carved Baton, or Mace (1/3).

This most ancient example of imitative art was found in the Madelaine Cave, on the river Vézère, by M. Lartet, when in company with M. Verneuil and Dr. Falconer. The circumstances of the discovery, therefore, no less than the character of the explorers, place its genuineness beyond suspicion. Its worth is great as a piece of contemporary portraiture of an animal known to us only by its fossil remains. But

this sinks into insignificance in comparison with its value as a gauge of the intellectual capacity of the men of the reindeer age of central Europe. Many of their carvings ornament the horn or ivory handles of implements and weapons; but the etching referred to was manifestly executed with no other aim than the gratification of the artistic taste of the draughtsman, and resembles the free sketches thrown off by an artist in an idle hour.

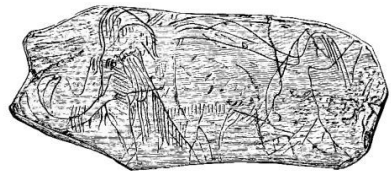


FIG. 38.—The Mammoth, engraved on ivory.

But there is another point worthy of notice here, the interest of which is greatly increased by the undoubted antiquity of the relic. This palæographic tablet is a right-handed drawing; and the same may be affirmed of the group of reindeer, and of others of the Madelaine etchings. They are executed in profile, looking to the left, as any right-handed draughtsman naturally does, unless he has some special reason for deviating from the direction which the facility of his pencil suggests.

The question of right-handedness, as a natural or acquired practice peculiar to man, has a special interest when viewed in relation to his innate instincts or attributes in the remote dawn of human intelligence thus anew brought to light. The universality of right-handedness as a characteristic of man has been assumed, partly on the concurrent evidence of language, which shows the general habit of using one hand in preference to another. But the prevalence of the use of the right hand among savage

nations is still a mere assumption. The statistics have yet to be collected, and are by no means readily accessible. Any evidence of the prevalence of right-handedness among a people still in the primitive stage of stone implements must be exceedingly vague. In the rude manipulations of a purely savage life, with the imperfection of the tools and the general absence of combined operations, the distinction in the use of one hand rather than the other is of little importance. In digging roots, climbing rocks or trees, in the rude operations of the primitive boat-maker or hut-builder, in hunting, flaying, cooking, or most other of the operations pertaining not only to the hunter, but even to the pastoral stage, there is little manifest motive for the use of one hand more than the other; and on the supposition of either becoming more generally serviceable, it would neither attract notice, nor interfere in any degree with the arts of life, though some gave a preference to the right hand, and others to the left. Hence the difficulty of determining the prevalence of right-handedness among savage nations. Its manifestations in the rude arts of the isolated workman are obscure, and any uniformity of action becomes apparent only in those combined operations which are comparatively rare in savage life. Yet even in the languages of the Hawaiians, Fijians, Maoris and Australians, terms are met with showing the preferential use of one hand. In the rudest state of society, man as a tool-using animal has this habit engendered in him; and as he progresses in civilisation, and improves on his first rude weapons and implements, there must arise an inevitable tendency to give the preference to one hand over the other, not only in combined action, but from the necessity of adapting certain tools to

the hand.[45]

An interesting episode relating to this assumed speciality of man is introduced in a communication by the Rev. W. Greenwell to the Ethnological Society of London, on the opening of some ancient Norfolk flint pits, popularly known as “Grime’s Graves.” In these were found not only implements of flint, a hatchet of basalt, hammers, stones of quartzite and other pebbles, and numerous clippings and cores of flint, along with a bone-pin, and another implement of bone which Mr. Greenwell supposes to have been used in detaching the flakes of flint for knives and arrow-heads; but also a number of primitive deer-horn picks, which had been used by the ancient quarrymen by whom the flint was thus procured, and fashioned into tools.

The picks made from the antlers of the red-deer were constructed simply by detaching the horn at a distance of about sixteen or seventeen inches from the brow end, and then breaking off all but the large brow-tine, with the help of fire and rude cutting implements of flint. They had been used both as picks and hammers, the point of the brow-tine serving for a pick, and the broad flat part opposite to it as a hammer for breaking off and detaching the flint from the chalk; while excavations through the solid chalk were effected by means of hatchets of basalt. The marks of both tools were abundant on the walls of the galleries; and many of the rude picks, including the two specially referred to, were coated with an incrustation of chalk, bearing the impress of the workmen’s fingers. Here, as in the Brixham cavern, an accident, which brought the ancient operations to an abrupt close, sealed up the evidence of them beyond reach of all obscuring interpolations, until their discovery in recent years. In clearing out

one of the subterranean galleries excavated in the chalk, it was found that “the roof had given way about the middle of the gallery, and blocked up the whole width of it. On removing this, it was seen that the flint had been worked out in three places at the end, forming three hollows, extending beyond the chalk face of the end of the gallery.” In front of two of these hollows lay two picks, corresponding to others found in various parts of the shafts and galleries, made from the antler of the red-deer. But in this case the writer notes that the handle of each was laid towards the mouth of the gallery, the tines, which formed the blades of the tools, pointing towards each other, “showing, in all probability, that they had been used respectively by a right and a left-handed man. The day’s work over, the men had laid down each his tool, ready for the next day’s work; meanwhile the roof had fallen in, and the picks had never been recovered,” until their reproduction in evidence of the supposed habits of the right and left-handed workmen, by whom they were employed at the close of that last day’s labour, in the prehistoric dawn.[46]



FIG. 39.—Scottish Stone Bracer.

Mr. Evans, in discussing the use of certain perforated plates of stone frequently found in British graves, adopts the idea that they were bracers, or guards, to protect the left arm of the archer against the recoil of the string in shooting with the bow. But, he adds, “unless there was some error in observation,

plates of this kind have been occasionally found on the right arm"; and he refers to a skeleton observed by Lord Londesborough, on the opening of a chambered barrow at Driffield, the bones of the right arm of which were laid in a very singular and beautiful armlet, made of some large animal's bone, set with two gold-headed bronze pins or rivets, most probably to attach it to a strap which passed round the arm, and was secured by a small bronze buckle found underneath the bones. This also Mr. Evans supposes to have been the bracer, or guard of an archer; and he adds, "possibly this ancient warrior was left-handed." A Scottish example, from a large tumulus on the shore of Broadford Bay, Isle of Skye, is here shown, Fig. 39. These plates, or guards, are most frequently made of a close-grained green chlorite slate; and in various cases flint arrow-heads have been noted among other contents of the same grave. But the cist in which the supposed left-handed warrior lay contained a bronze dagger, some large amber beads, and a drinking-cup; but no arrow-heads to confirm the idea that he had been laid to rest with his bow beside him, and the guard ready braced on his arm, like one of the seven hundred left-handed Benjamites, every one of whom could sling stones at a hair's breadth, and not miss. Possibly the novel and richly finished armlet occupied its proper place on the right arm as a personal decoration suited to the rank of the wearer.

But bronze pins and daggers carry us into later times than those of the Troglodytes of the Dordogne. Ancient though the Driffield barrow unquestionably is according to ordinary chronology, it is a very recent sepulchre compared with the catacombs of the French reindeer period, the drawings from which undoubtedly suggest the right-handedness of the

draughtsmen who used the stylus and graver so dexterously in that birthtime of the fine arts in transalpine Europe.

But similar traces of primitive art, assigned to a still earlier epoch, have been recently reported from the vicinity of the Dardanelles. Mr. Frank Calvert describes the discovery of numerous stone implements, some of them of large size, and much worn, imbedded in drift two or three hundred feet thick, underlying stratified rocks, as he believes, of the miocene period. Flint implements are rare, and the most common material is red or other coloured jasper. Among fossil bones, teeth, and shells from the same formation, remains of the Dinotherium, and the shell of a species of Melania pertaining to the miocene epoch, have been identified; and Mr. Calvert writes to the *Levant Herald*:—"From the face of a cliff composed of strata of that period, at a geological depth of 800 feet, I have myself extracted a fragment of the joint of a bone of either a dinotherium or a mastodon, on the convex side of which is deeply incised the unmistakable figure of a horned quadruped, with arched neck, lozenge-shaped chest, long body, straight forelegs, and broad feet. There are also traces of seven or eight other figures, which, together with the hind quarters of the first, are nearly obliterated. The whole design encircles the exterior portion of the fragment, which measures nine inches in diameter, and five in thickness. I have also found, not far from the site of the engraved bone, in different parts of the same cliff, a flint flake, and some bones of animals fractured longitudinally, obviously by the hand of man, for the purpose of extracting the marrow, according to the practice of all primitive races."[47]

These traces of primitive art Mr. Calvert

recognises as “conclusive proofs of the existence of man during the miocene period of the tertiary age.” They at least furnish additional illustrations of his intellectual activity, however remote the antiquity to which he is traced; and show the same ideas of comparison which enter so largely, not only into modern artistic design, but into much of the rhetoric and poetry of later times.

Among living races the Innuit of Alaska, within three degrees of Behring’s Strait, are skilful carvers in ivory. They chiefly use the teeth of the Beluga, a small white whale common in their seas, and from this they carve birds, fish, seals, deer, and other animals, as well as bodkins, needles, awls, and other implements, with considerable skill. They obtain the walrus tusks in barter from more northern tribes; and from those they make fish-spears, harpoons, and other larger implements. They also amuse themselves with graving, on plates of bone or ivory, dances, hunting-scenes, and other familiar incidents. Of the latter, Mr. W. H. Dall remarks, in his interesting narrative of *Alaska and its Resources*: “These drawings are analogous to those discovered in France, in the caves of Dordogne.”[48] They are so, in so far as both are attempts at representing contemporary animal life by untutored man; but the accompanying illustrations of Innuit art show how greatly the work of the modern savage draughtsman falls short of that of the artist of the Mammoth epoch of Europe.



FIG. 40.—Hunter’s Tally Deer’s-horn.

Fortunately our knowledge of the men of that remote era is supplemented by evidence of a still more direct kind. In 1868 the construction of a

railroad led to the removal of an extensive talus on the left bank of the river Vézère, at Cro-Magnon, exposing a cave, or shallow recess in the face of the rock, within which were found a succession of strata, with traces of the action of fire, and including flint scrapers, bone bodkins, arrow-points, and other implements, along with bones of the *Elephas primigenius*, *Felis spelæa*, the reindeer, fossil-horse, and ivory tablets and tynes of deer-horn, marked with a series of notches, supposed to be hunters' tallies recording the produce of the chase. One of the latter, interesting as an illustration of these earliest efforts at numerical notation, is shown in Fig. 40. But most valuable of all were the human skeletons, including those of an old man, a woman, and portions of others of two young men, and a child. Beside them lay nearly three hundred marine shells, chiefly the *Littorina littorea*, some perforated teeth, and—as if to determine the era of the Troglodytes of Cro-Magnon,—several implements made of reindeer horn.

Evidence of a similar kind accumulates with the interest which it has excited. To the south of the Alps the caverns of Baoussé Roussé have yielded a singularly rich series of implements and personal ornaments of flint, ivory, bone, and shell; and more important than all, a nearly perfect human skeleton, brought to light in the Mentone Cave, with the skull still decorated with its ornamental head-gear of perforated shells (*Cyclonassa neritea*) and canine teeth of the *Cervus elaphus*, originally strung, as is supposed, on a net for the hair. Across the forehead lay a large bone hair pin, made of the radius of a stag, with the natural condyle retained as its head. [49] The correspondence between the Mentone skull and those of Cro-Magnon is considerable. Already,

therefore, sufficient remains of the ancient cave dwellers have been recovered to enable us to form some definite idea of their physical characteristics.

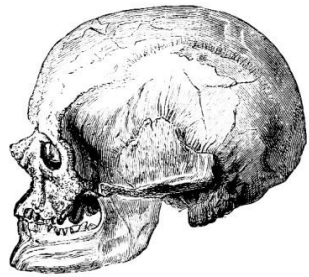
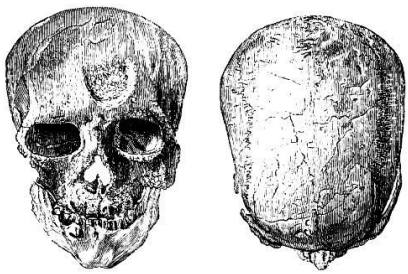


FIG. 41.—Skull of Old Man of Cro-Magnon—Profile.

The Cro-Magnon men and women are large of stature. Their skulls, like that of the Mentone Cave, are of a dolichocephalic type, and so far accord with the Esquimaux, rather than with any Turanian head-form. But it is important to note that in no other respect do they yield the slightest countenance to the theory favoured by some, that the cave-men of palæolithic Europe bore an affinity to the Esquimaux, and that in the latter we have the living representatives of post-glacial, if not still older man. If indeed the Cro-Magnon and Mentone skulls are, as they have been assumed to be, those of contemporaries of the mammoth and reindeer of Southern Europe, Dr. Pruner-Bey remarks of the race: "If we consider that its three individuals had a cranial capacity much superior to the average at the present day; that one of them was a female, and that female crania are generally below the average of male crania in size; and that nevertheless the cranial capacity of the Cro-Magnon woman surpasses the average capacity of *male* skulls of to-day, we are led to regard the great size of the brain as one of the

more remarkable characters of the Cro-Magnon race. This cerebral volume seems to me even to exceed that with which at the present day a stature equal to that of our cave-folks would be associated: whether the skulls from the Belgium caves are small, not only absolutely, but even relatively in the rather small stature of the inhabitants of those caves."[50] Along with this ample cerebral development, the general form of the head is graceful and symmetrical. Alike in the Cro-Magnon and Mentone examples the total absence of prognathism is noted. An expressive, though strongly marked orthognathic profile with ample forehead, prominent nose, moderately developed superciliary ridges and maxillaries, and a well-formed chin, all compare favourably, not only with the foremost savage races, but with many civilised nations of modern times.



Skull of Old Man of Cro-Magnon.
FIG. 42.—Front View. FIG. 43.—Vertical View.

Of the age of those Troglodytes of France, M. Lartet remarks: "The presence of the remains of an enormous bear, of the mammoth, of the great cave-lion, of the reindeer, the spermophile, etc., in the hearth-beds, strengthens in every way the estimation of their antiquity; and this can be rendered still more rigorously, if we base our argument on the predominance of the horse here, in comparison with

the reindeer, on the form of the worked flints, and of the bone arrow and dart-heads."[51] This argument, however, overlooks the possibility of the interments long after the accumulation of the hearth-beds with their included relics. Assuming this cavern period of Central France as the later subdivision of the palæolithic age of Europe, its drawings and carvings represent the arts of a remote era, compared even with the polished stone-hammers and chipped flints contemporary with the oldest implements of bronze. It is obvious, therefore, that a comparison between the rude worked flints of the cave-men of Southern France, and the highly finished stone implements of the Bronze Period of Northern Europe, is no true gauge of any intermediate progress or development. The artist to whose pencil or graving-tool we owe the only authentic portraiture of the mammoth, unquestionably possessed skill and intellectual vigour adequate to the production of any stone implement or personal ornament pertaining to the arts of Western Europe at the commencement of its metallurgic period. In truth it is far easier to produce evidences of deterioration than of progress, in instituting a comparison between the contemporaries of the mammoth, and later prehistoric races of Europe, or savage nations of modern centuries. They had advanced, as M. Paul Broca says, "to the very threshold of civilisation." They possessed arts, industry, and apparently such a degree of social organisation as their external circumstances admitted of. But then, as at many subsequent periods, the elements of progress were arrested at this stage, and the whole work of civilisation had to be begun anew.

A careful study of the native arts of the American continent, in subsequent chapters, will bring under our notice the intellectual efforts of man in a purely

savage state, and so help to a determination of what is implied in certain partial manifestations of mimetic design. This is the true corrective of any tendency to an undue estimate of the general progress implied by such evidence. It will be seen that a rare aptitude is shown among certain tribes for mimetic drawing and carving; yet it is of limited application, and accompanied by little superiority to surrounding tribes in the employment of the arts for the general requirements of savage life. Even in such cases, however, it is an evidence of latent powers, capable of development under favourable circumstances. The Esquimaux have been stimulated by the necessities of Arctic life to great ingenuity in the fashioning of their weapons, and in all other appliances of the chase, on which their very existence depends; but they are skilful, as a savage people, in the ornamental, as well as the useful arts. Their skin and fur dresses are fashioned and decorated with great taste; and many of their ivory and bone implements are beautifully carved. There is in the Museum of the University of Toronto a set of Esquimaux children's toys, including miniature men, dogs, sledges, and objects of the chase, all carved in ivory with ingenious skill. The Thlinkets of Alaska, lying on the borders of the true Esquimaux region, make ladles and spoons from the horns of the deer, the mountain sheep, and the goat, which are special objects of the chase, and carve them with elaborate ingenuity. Grotesque masks of wood, paddles, knife handles of bone, bodkins, combs, and other personal ornaments, chiefly of walrus ivory, are all carved with great variety of design, though scarcely in a style of high art.

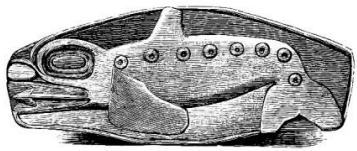


FIG. 44.—Tawatin Ivory Carving of Whale.

Among the tribes lying immediately to the south, the Tawatin Indians of British Columbia specially excel in ivory carving. Their personal ornaments are lavishly decorated; and many of their carvings resemble in so far the mammoth portraiture of the Madelaine artist, that they are simply efforts of skill, having no other end in view than the pleasure derived from their execution. It will be seen, however, in the conventional representation of the whale, as shown in Fig. 44, how far they fall short of the ancient workers in ivory in literal truthfulness of delineation. In one respect indeed this piece of Tawatin carving recalls a characteristic of early Christian art. Trifling as the correspondence is, it is curious thus to find the modern Indian carver of the Pacific coast giving to the monster of the deep the same barbed tongue which forms the conventional attribute of the dragons and leviathans of medieval Europe. But it is greatly more interesting to note, not only the thoroughly native style of art of their more elaborate carvings; but to recognise in many of them certain traits which recall characteristics of the finished sculptures on the ruins of Central America and Yucatan. This is strikingly shown in another of their carvings, Fig. 45, where some of the points of resemblance help to confirm other traces, hereafter indicated on different grounds, of early intercourse, if not of a common relationship, between savage tribes of the North-West, and ancient civilised nations of Central America and the Mexican plateau.



FIG. 45.—Tawatin Ivory carving.

In times still prehistoric, though apparently recent in comparison with the mammoth or reindeer period of France, the works of the ancient Lake-dwellers of Switzerland furnish illustrations of the application of horn, bone, and ivory to many useful purposes for which the metals are now considered as alone suitable. The site of the pfahlbauten at Concise, on Lake Neuchâtel, has been peculiarly rich in the illustrations it has yielded of implements in flint, stone, bone, horn, and also in bronze. The skulls, horns, and bones, both of domesticated animals, and of those procured in the chase, are also abundant; and among the latter, the red deer and the wild boar appear to have predominated as articles of food.

The Natural History Museum of Cambridge, Massachusetts, which owes its existence to the indefatigable zeal of the lamented Professor Agassiz, is enriched by a collection of remains of the ancient Swiss Lake-dwellers, obtained under peculiarly favourable circumstances. The father of the distinguished naturalist was for a period of fifteen years the clergyman of Concise; and it chanced that the son revisited his native canton at a time when the construction of a railway viaduct across part of the neighbouring lake led to the discovery of numerous traces of its ancient population. He was accordingly able to secure a choice collection illustrative of aboriginal arts, including some characteristic specimens of horn and bone implements, from which some illustrative examples

are here selected. Fig. 46 may be described as a chisel made of a hog's tooth inserted in a haft of deer's-horn, precisely after a fashion familiar to the Red Indian, of converting the incisor of the beaver into a useful cutting tool. The same collection includes knives, daggers, bodkins, or awls, made of bone or ivory, and hafted in like manner with horn; as well as implements of flint and stone hereafter referred to.[52]

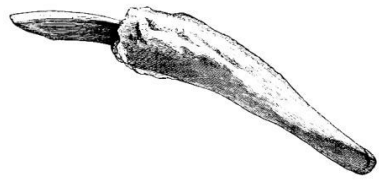


FIG. 46.—Hog's Tooth Chisel, Concise.

Among the tools and personal ornaments wrought of mammoth ivory, which Dean Buckland describes as found in the Goat Hole Cavern at Paviland, is a skewer made of the metacarpal bone of a wolf, flattened at the edge at one end, and terminated at the other by the natural rounded condyle of the bone. Implements of this type are by no means rare. The original disclosures of Kent's Cavern included arrow and lance-heads, bodkins, pins, hair-combs, netting-tools, and other implements, all made of bone. Similar objects have been repeatedly found in Scottish weems and brochs, and in the kitchen-middens of Britain, Denmark, and other European accumulations of the like kind. Fig. 47 represents a group of such objects, chiefly from one of the primitive subterranean dwellings, at Skara, in Orkney. It includes a small perforated ivory pin, and a bodkin made after the fashion of the Goat Hole wolf-bone implement from the metatarsal bone of a small ox. Implements of this simple character are common to the arts of many periods and states of society; and like the flint and stone implements of nearly every age and country, help to illustrate the tool-making instinct peculiar to man.



FIG. 47.—British Bone Implements.

Isolated in the little island-worlds of the Pacific Ocean, man is found again and again, in a condition which seems to involve all but absolute privation of the materials on which his constructive faculty can operate. The extensive archipelago interposed between the Society and Gambier Islands and the Marquesas, consists exclusively of coral islands. There the native arts are mostly of an inferior character; though their small and slight canoes are propelled with great rapidity by means of a paddle ingeniously formed with a curved blade. But every idea of rudeness in their arts gives way to wonder and admiration on discovering the limited materials at the command of the workmen. The cocoa-palm furnishes supplies for matting and weaving, and the cassytha stems and cocoa-nut fibre are plaited into ropes. A finer cord is made of human hair; and bones of the turtle and the larger kinds of fish supply the only material for fish-hooks and spears. There are no natural productions on the islands harder than shell or coral; and from these accordingly the native tools are made. Here, therefore, we see what reason is capable of achieving in the development of ingenious arts, amid a privation of nearly all that seems indispensable to the first efforts at constructive skill. Compared with such inadequate means, the flint, stone, horn, and bone of Europe's stone-period seem little less ample, than the contrast of her later metallurgic riches with the resources of that primitive era.

Though the natives of the Antilles possessed some natural advantages over the inhabitants of the volcanic and coral islands of the Pacific: yet the abundance of large and easily-wrought shells invited their application to many useful purposes; and accordingly when first visited by the Spaniards, the

large marine shells with which the neighbouring seas abound, constituted an important source for the raw material of their implements and manufactures. The great size, and the facility of workmanship of the widely-diffused *pyrulæ*, *turbinella*, *strombi*, and other shells, have indeed led to a similar application of them among uncivilised races, wherever they abound. Of such, the Caribs made knives, lances, and harpoons, as well as personal ornaments; while the mollusc itself was sought for and prized as food. In Barbadoes the *Strombus gigas* still furnishes a favourite repast; and numerous weapons and implements made from its shells have been dug up on the island. The accompanying illustrations (Fig. 48) are selected from specimens illustrative of the primitive manufactures of the Antilles presented to me by Dr. Bovell. They were dug up with other relics, in the island of Barbadoes, where traces of the aboriginal Carib blood continued till very recently to mark a portion of the coloured population. The Christy collection includes various examples of axes believed to be of Carib workmanship, from Porto Rico, St. Juan, and St. Thomas. They are worked in greenstone, mottled jade, green jasper, and a hard light green slate, mostly in wedge-form. But the most characteristic specimen of local art is an axe of coral rock, 7½ inches long, semi-cylindrical, and tapering at both ends, which was found in the cave of Cuevetas, twenty miles from Puerto del Principe, Cuba.

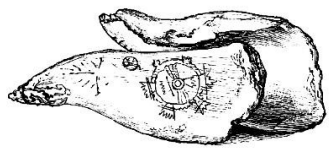


FIG. 48.—Carib Shell-Knives.

The Carib aborigines of the Antilles furnish a striking example of what the more active manifestations of moral degradation among a savage people really imply. Compared with the gentle, passive Indians met by the Spaniards on the first islands visited by European explorers, the Caribs were a cruel and fierce race of cannibals, as hateful in all their most salient characteristics as the New Zealanders or Fijians. Yet time has proved, even under very unfavourable circumstances, that the fierceness and aggressive cruelty of the Caribs of the Lesser Antilles corresponded to the wild fury of the old viking rovers of Europe, and gave proof of energy and stamina capable of sturdy endurance; while the gentle and friendly Indians of the larger Antilles, without, in reality, any superior moral attributes, but only the characteristics of a weak and passive nature, have disappeared, leaving behind them scarcely a memorial of their existence. The Caribs are the historic race of the Antilles. Their chronicles derive vitality and endurance, like those of ancient Europe, from the vicissitudes of war. Those show them as restless aggressors; and though long since expelled from their ancient insular possessions, they still appear on the southern mainland as the people of an encroaching area; and the marches of their extending frontier ring with the shouts of border warfare, as fierce, and to us not greatly less substantial than the Wendish and Bulgarian warrings of Henry the Fowler, and his German Markgräfs of well-nigh a thousand years ago.

In 1851, Sir Robert Schomburgk communicated to the British Association the results of recent ethnological researches in St. Domingo. In these the observant traveller deplored the fact that of the millions of natives who at its discovery peopled the

island, not a single pure descendant now exists, though he could trace in the Indios of mixed blood the peculiar features and other physical characteristics of the Indian still uneradicated. In the absence of a true native population, Sir Robert Schomburgk remarks: “My researches were restricted to what history and the few and poor monuments have transmitted to us of their customs and manners. Their language lives only in the names of places, trees, and fruits, but all combine in declaring that the people who bestowed these names were identical with the Carib and Arawaak tribes of Guiana. An excursion to the calcareous caverns of Pommier, about ten leagues to the west of the city of Santo Domingo, afforded me the examination of some picture-writings executed by the Indians after the arrival of the Spaniards. These remarkable caves, which are in themselves of high interest, are situated within the district over which, at the landing of the Spaniards, the fair Indian Catalina reigned as cacique.” To this district they were tempted by the news of rich mines in its mountains. In 1496, a fortified tower was erected, called originally San Aristobal; but so abundant was the precious metal, that even the stones of the fortress contained it, and the workmen named it the Golden Tower. But the lives of millions of the miserable natives were sacrificed in recovering the gold from their mountain veins; and then, the mines being exhausted, the country was abandoned to the exuberance of tropical desolation, while the caverns which had previously been devoted to religious rites, became places of retreat from the Spaniard and his frightful bloodhounds. One of the smaller caves still exhibits a highly interesting series of symbolic pictures, which the Indians had traced on its white and smooth walls.

Near the entrance of a second cave, Sir R. Schomburgk discovered decorations of a more enduring character carved on the rock, and of these he remarks: “They belong to a remoter period, and prove much more skill and patience than the simple figures painted with charcoal on the walls of the cave near Pommier. The figures carved of stone, and worked without iron tools, denote, if not civilisation, a quick conception and an inexhaustible patience, to give to these hard substances the desired forms.” From his examination of the tools and utensils still in use in Guiana, Sir Robert doubted such to be the work of the Caribs; but he admitted that they are only found where we have sure evidence of their presence; and he under-estimated both the skill and patience shown by many native artists equally poorly provided with tools.

Other relics of native art and history attracted the attention of the traveller, and he specially dwelt with interest on a paved ring of granite, upwards of 2200 feet in circumference, with a human figure rudely-fashioned in granite occupying the centre. It stands in the vicinity of San Juan de Maguana, in St. Domingo, which formed, at the time of its first discovery, a distinct kingdom, governed by the cacique Caonabo, the most fierce and powerful of the Carib chiefs, and an irreconcilable enemy of the European invaders. It is called at the present day, “El Cercado de los Indios,” but Sir Robert Schomburgk questioned its being the work of the inhabitants of the island when first visited by the Spaniards, and assigned it, along with figures which he examined cut on rocks in the interior of Guiana, and the sculptured figures of St. Domingo, to a people far superior in intellect to those Columbus met with in Hispaniola. These he conceived to have come from

the northern part of Mexico, adjacent to the ancient district of Huastecas, and to have been conquered and extirpated by their Carib supplanters, prior to European colonists displacing them in their turn.

The roving Caribs supplied themselves with axes and clubs of jade, greenstone, and others of the most prized materials of the mainland; but they turned the easily wrought shells of the neighbouring seas to account in much the same way as the natives of the coral islands of the Pacific to whom any harder material is unknown. But while noting the varied uses to which the shells of the Caribbean Sea were applied by the natives of the archipelago, a greater interest attaches to the indications of an ancient trade in these products of the Gulf of Florida, carried on among widely-scattered tribes of North America, long before its discovery by Columbus.

Abundant evidence proves that the large marine shells were regarded with superstitious reverence, alike by the more civilised nations of the land around the Gulf, and by others even so far north as beyond the shores of the great Canadian Lakes. In the latter case it is not difficult to account for the origin of such a feeling among tribes familiar only with small native fresh-water shells. But in one of the singular migratory scenes of the ancient Mexican paintings, copied from the Mendoza Collection,[53] in the Bodleian Library at Oxford, a native, barefooted, and dressed in a short spotted tunic reaching to his loins, bears in his right hand a spear, toothed round the blade, it may be presumed with points of obsidian, and in his left hand a large univalve shell. A river, which he is passing, is indicated by a greenish stripe winding obliquely across the drawing, and his track, as shown by alternate footprints, has previously crossed the same stream. On this trail he is followed

by other figures nearly similarly dressed, but sandalled, and bearing spears and large fans; while a second group approaches the river by a different trail, and in an opposite direction to the shell-bearer. Other details of this curious fragment of pictorial history are less easily interpreted. An altar or a temple appears to be represented on one side of the stream; and a highly-coloured circular figure on the other, may be the epitomised symbol of some Achæan land or Sacred Elis of the New World. But whatever be the interpretation of the ancient hieroglyphic painting, its general correspondence with other migratory depictions is undoubted; and it is worthy of note, that, in some respects, the most prominent of all the figures is the one represented fording the stream, and bearing a large tropical univalve in his hand.

The evidence thus afforded of an importance attached to the large sea-shells of the Gulf of Mexico, among the most civilised of the American nations settled on its shores, deserves notice in connection with the discovery of the same marine products among relics pertaining to Indian tribes upwards of three thousand miles distant from the native habitat of the mollusca, and separated by hundreds of miles from the nearest sea-coast.



FIG. 49.—Tennessee Idol.

Tracing them along the northern route through the Mississippi and Ohio valleys, these shells have been found in the ancient graves of Tennessee, Kentucky, and Indiana, and northward to the regions of the Great Lakes. Dr. Gerard Troost, in a communication to the American Ethnological Society,[54] describes an interesting series of sepulchral remains discovered in Tennessee. The crania were characterised by remarkable artificial compression, as in an example figured by Dr. Morton (plate 55, *Crania Americana*), and the graves abounded with relics, “lares, trinkets, and utensils, all of a very rude construction, and all formed of some natural product, none of metal.” From an examination of those, Dr. Troost was led to the conclusion that the race to whom they pertained came from some tropical country. Among their stone implements obsidian abounded. Numerous beads were formed of tropical marine shells of the genus

marginella, ground so as to make a perforation on the back, by means of which they could be strung together for purposes of personal ornament. Plain beads were made from the columellæ of the *Strombus gigas*; and such columellæ were found worked to a uniform thickness, perforated through the centre, and in all stages of manufacture, to that of perfected beads and links of the much-prized *wampum*. Similar accumulations of shell beads in the great mounds of the Ohio valley are referred to in a subsequent chapter; but another relic has an additional value from the light it throws not only on early native arts, but on ancient manners and modes of thought. Dr. Troost describes and figures various rudely sculptured idols, from some of which he was led to assume the existence of Phallic rites among the ancient idolaters of Tennessee. The greater number of the idols were of stone, but the one figured here (Fig. 49) has been modelled of clay and pounded shells, and hardened in the fire. It represents a nude human figure, kneeling, with the hands clasped in front; and when found, it still occupied, as its primitive niche or sanctuary, a large tropical shell (*Cassis flammea*), from which the interior whorls and columella had been removed, with the exception of a small portion at the base, cut off flat, so as to form its pedestal. The special application of this example of the tropical cassides adds a peculiar interest to it, as manifestly associated with the religious rites of the ancient race by whom the spoils of southern seas were transported inland, and converted to purposes of ornament and use.

The discovery of similar relics to the north of the Great Lakes is still more calculated to excite interest; and, indeed, when first brought under notice they gave rise to extravagant ethnological theories, based

on the assumption of their East Indian origin.[55] But though they furnished no evidence of such far wanderings from the old East, they throw considerable light on ancient migrations of native American races, and illustrate the extent of traffic carried on between the north and south, in ages prior to the displacement of the Red-man by the European. Two large tropical shells, both specimens of the *Pyrula perversa*, have been presented to the Canadian Institute at Toronto: not as examples of the native conchology of the tropics, but as Indian relics pertaining to the great northern chain of fresh-water lakes. The first was discovered on opening a grave-mound at Nottawasaga, on the Georgian Bay, along with a gorget made from the same kind of shell; the second was brought from the Fishing Islands, near Cape Hurd, on Lake Huron. Thirteen other examples from the Georgian Bay are in the Museum of Laval University; and many more have come under my notice procured from grave-mounds and sepulchral depositories in different parts of Western Canada. Recently, in the summer of 1874, a large ossuary of the Tiontonones, or Petuns, was accidentally opened at Lake Medad, in the county of Wentworth, within which were found evidences of extensive sepulture, numerous clay and stone pipes of curious workmanship, shell and stone implements, and a number of the same tropical shells, both whole and in pieces, most of which are now in the possession of Mr. B. E. Charlton of Hamilton, Ontario. Similar ossuaries have been repeatedly opened in the Huron Country, between Lake Simcoe and the Georgian Bay. In one pit, about seven miles from Penetanguishene, three large conch-shells were found, along with twenty-six copper kettles, a pipe, a copper bracelet, a quantity of shell beads, and

numerous other relics. The largest of the shells, a specimen of the *Pyrula spirata*, weighed three pounds and a quarter, and measured fourteen inches in length; but a piece had been cut off this, as well as another of the large shells, probably for the manufacture of some smaller ornament. In another cemetery in the same district, among copper arrow-heads, bracelets, and ear-ornaments, pipes of stone and clay, beads of porcelain, red pipe-stone, etc., sixteen of the same prized tropical univalves lay round the bottom of the pit arranged in groups of three or four together. From such shells the sacred wampum, official gorgets, and other special decorations were made; and the appearance of some of those found in northern graves suggests that they may have been handed down through successive generations as great medicines, before their final deposition, with other rare and costly offerings, in honour of the dead.

The attractions offered by such products of tropical seas are by no means limited to the untutored tastes of the American Indian. In India, China, and Siam, the *Pyrum*, and other large and beautiful shells of the Indian Ocean, are no less highly prized by the natives, not only as an easily wrought material for implements and personal ornaments; but in some cases, as vessels employed in their most sacred rites. A sinistrorsal variety found on the coasts of Tranquebar and Ceylon, is devoted by the Cingalese exclusively to such purposes. Reversed shells of the species *Turbinella*, are held in like veneration in China, where great prices are given for them; and are often curiously ornamented with elaborate carvings, as shown on several fine specimens in the British Museum. They are kept in the pagodas, and are not only employed by the

priests on special occasions in administering medicine to the sick; but the vessel for holding the consecrated oil, with which the Emperor is anointed at his coronation, is made from one of them.

Such analogies in the choice of materials, and in objects set apart for the sacred rites of different nations, are full of interest in reference to characteristics common to man in all ages, and in regions the most remote. But when they are met with in the arts and customs of the same continent, they point with greater probability to borrowed usages, and often help the ethnologist to track the footprints of migrating nations to their earlier homes. But the use of shells for personal ornaments has been traced back, along with other evidence of the antiquity of man, almost to what seems the primeval dawn. In the caves of southern France and Italy, along with mammoth and reindeer bones and ivory, and in the sepulchral deposits at Aurignac, lay shell necklaces or bracelets made of the *Littorina littorea*, still abundant on the shores of the Atlantic, along with perforated shells of the miocene period, evidently gathered in a fossil state to be converted to purposes of personal decoration. So also in a later, but still prehistoric age, the megalithic tomb, brought to light, in 1838, under the Knock-Maraidhe Cromlech in the Phœnix Park, Dublin, disclosed two male skeletons, underneath the skulls of which lay a number of the common *Nerita littoralis*, perforated, evidently for the purpose of being strung together as neck ornaments. An ornamental bone-pin, with a knob carved at each end, and a rude flint-knife, constituted the only other contents of this primitive tomb which had been constructed with such costly toil.

Other British cists and cairns have disclosed

similar relics of the shell necklace and bracelet, made of the oyster, limpet, and cockle shells, the contents of which supplied an important source of food. For not only in the ancient kitchen-middens of northern Europe, but mingling with more ancient cave deposits, as in Kent's Cavern, lay heaps of the shells of such edible molluscs, the refuse of the table of the old cave-men, which shows one resource on which they depended for subsistence. America, too, had its ancient shell and refuse heaps, as at Cannon's Point, St. Simon's Island, Georgia, where a vast mound of oyster and mussel shells, intermingled here and there with a mediola or helix, and with flint arrow-heads, stone axes, and fragments of pottery, covers an area of not less than ten acres. But they abound upon all the sea islands of the Southern States, and in many cases constitute regular sepulchral mounds or shell cairns. One of these singular cairns on Stalling's Island, in the Savannah river, more than two hundred miles from its mouth, is an elliptical mound measuring nearly three hundred feet in length, and enclosing, along with human skeletons, bones of large fish, deer, and other wild animals, accompanied with broken pottery, arrow-heads, axes, flint-knives, and charred wood. On the islands, and along the coast of Georgia and Florida, the inexhaustible supplies of oysters, conches, and clams, furnished an abundant supply of food. Around the Indian villages the shells accumulated in waste heaps; and even now, at times, show the circular hollow where the native hut had stood. With a mild climate, abundant game and indigenous fruits, in addition to the inexhaustible spoils of the sea, the Southern Indians had little temptation to roam; and the numerous shell-mounds and cairns afford proof of their settled occupation of many localities. A large

drinking-cup, made of the conch-shell, was one of the special attributes of the Indian cacique; and such cups are frequently found deposited beside the buried skeleton.

Fresh-water shell heaps also abound; and Professor Jeffries Wyman made those of East Florida the subject of an interesting paper in *The American Naturalist*. Such memorials of the encampments of the aborigines are historical records of the habits and customs of ancient native tribes. The fresh-water mussels, which constituted an important article of food, and also supplied the pearls which they prized for decoration, enter largely into the contents of the heaps. Intermingled with them are "numerous fragments of pottery, stone axes, chisels, crushing-stones, awls, mortars, net-sinkers, arrow and spear points, flint-knives, shell beads, soapstone ornaments, pipes, and the bones of deer, buffalo, alligators, turtles, racoons, and other animals."[56] Many of the bones have been split, like those found in the ancient mounds and caves of Europe, for the purpose of extracting the marrow; and along with such evidences of culinary arts are piles of chipped flint and stone, with broken or unfinished axes, spear and arrow-heads, and other traces of the Indian tool-maker's workshop. In all ways we thus recognise, amid diversities of race, climate, and other external circumstances, many minute analogies between the men of palæolithic and neolithic ages of Europe, and those of the new world's more recent centuries, in regions apart from its singular centres of a native civilisation.

But also the convenient form and beauty of various marine shells have led to their use, not only as a substitute for the flint and stone of other localities, or the unknown bronze and iron of later

ages, but even for the precious metals as the medium of a recognised currency, and this from times of unknown antiquity, alike in the old world and in the new. Of such substitutes for a metallic currency the *Cyprœa moneta* is the most familiar. The cowrie shells used as currency are procured on the coast of Congo, and in the Philippine and Maldive Islands. Of the latter, indeed, they still constitute the chief article of export. At what remote date, or at what early stage of rudimentary civilisation, this singular representative shell-currency was introduced, it is perhaps vain to inquire; but the extensive area over which it has long been recognised proves its great antiquity. The Philippine Islands form, in part, the eastern boundary of the Southern Pacific, and the Maldives lie off the Malabar coast in the Indian Ocean; but their shells circulate as currency not only through Southern Asia, but far into the African continent.

Corresponding to this cowrie currency of Asia and Africa is the American Ioqua, or *Dentalium*, a shell found chiefly at the entrance of the Strait of De Fuca, and employed both for ornament and money. The Chinooks and other Indians of the Northern Pacific coast wear long strings of ioqua shells as necklaces and fringes to their robes. These have a value assigned to them, increasing in proportion to their size, which varies from about an inch and a half to upwards of two inches in length. Mr. Paul Kane thus wrote to me: “A great trade is carried on among all the tribes in the neighbourhood of Vancouver’s Island, through the medium of these shells. Forty shells of the standard size, extending a fathom’s length, are equal in value to a beaver’s skin; but if shells can be found so far in excess of the ordinary standard that thirty-nine are long enough to make

the fathom, it is worth two beavers' skins, and so on, increasing in value one beaver skin for every shell less than the first number."

But as the New World has thus its disclosures and illustrations of native arts and usages full of interest to the student of primeval man, so also the first glimpse of a western hemisphere revealed its aborigines already familiar with that distinctive evidence of reason, the art of fire-making, earliest of all the practical sciences, and the indispensable precursor of every higher art of civilisation.

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[44] *Ancient Stone Implements of Great Britain*, Fig. 405, p. 460.

[45] For a detailed discussion of this subject in its general bearings, *vide* "*Right-handedness*," *Canadian Journal, N.S.*, vol. xiii. p. 193.

[46] *Journ. Ethnol. Soc., N. S.*, vol. ii. p. 419.

[47] *Athenæum*, April 5, 1873.

[48] *Alaska and its Resources*, p. 237.

[49] *Découverte d'un Squellette humain de l'époque Paléolithique dans les cavernes des Baoussé Roussé*, par Emile Rivière, p. 31.

[50] *Reliquiæ Aquitanicæ.* VII. Account of the human bones found in the cave of Cro-Magnon in Dordogne, by Dr. Pruner-Bey.

[51] *Reliquiæ Aquitanicæ.* M. Louis Lartet, p. 70.

[52] For a more detailed account, *vide Proc. Soc. Antiq. Scot.*, vol. vi. p. 376.

[53] Lord Kingsborough's *Mexican Antiquities*, vol. i. plate 68.

[54] *Transactions, American Ethnological Society*, vol. i. pp. 355-365.

[55] *Inquiry into the Origin of the Antiquities of America*, p. 162.

[56] *Antiquities of the Southern Indians*, p. 200.

CHAPTER V.

FIRE.

THE FIRE-USING ANIMAL—ESQUIMAUX USE OF FIRE—FUEGIAN FIRE-MAKING—MODES OF PRODUCING FIRE—AUSTRALIAN FIRE-MYTH—MEN OF THE MAMMOTH AGE—HEARTHS OF THE CAVE-MEN—PACIFIC ROOT-WORD FOR FIRE—GREAT CYCLE OF THE AZTECS—REKINDLING THE SACRED FIRE—PERUVIAN SUN-WORSHIPPERS—SACRIFICE OF THE WHITE DOG—SACRED FIRES OF THE MOUND-BUILDERS—INDIAN FIRE-MAKING—SANCTITY OF FIRE—TIERRA DEL FUEGO.

No incident attending the discovery of America is more suggestive than the evidence which first satisfied Columbus that his exploration of the mysterious western ocean had not been in vain. The sun had descended beneath the waves as his eye ranged along the horizon in search of the long expected land, when suddenly a light glimmered in the distance, once and again reappeared to the eyes

of Pedro Gutierrez and others whom he summoned to confirm his vision, and then darkness and doubt resumed their reign. But to Columbus all was clear. Not only did those flitting gleams reveal to him certain signs of the long-wished-for land; they told him no less clearly that the land was inhabited by man.

There is something singularly significant in the old Greek myth which represents the Titanic son of Iapetus stealing the fire of Zeus that he might confer on the human race a power over the crude elements of nature. Man is peculiarly fire-using. The element which becomes in his hands a power that controls all the others, and subjects them to his use, is an object of dread to the lower animals, alike amid arctic snows and the shadows of a night-camp in the tropics. Its use, moreover, is so universal as to admit of its being regarded as one of the primitive instincts of man, and so peculiarly his own that he may be appropriately designated the *fire-using animal*. Nevertheless, his supposed ignorance of fire during primitive ages has been employed as an argument in confirmation of the idea that the first habitat of man must have been a climate where his unclothed body experienced no discomfort from the changing seasons, and where fruit was found in sufficient abundance to supply his wants without need of artificial preparation.[57]

Yet it is in climates where the torrid sun presents itself as the life-giving force that, alike in the old and the new world, the worship of fire, and the rites associated with its use, have been found most fully developed. It is noticeable, moreover, that fire is less used in the frigid than in the temperate zones as the direct source of heat. The Esquimaux in his snow-hut would find a fire productive only of discomfort. Even

in the adaptation of animal food to his use cookery is less indispensable than in other latitudes; and fire is more prized by him in his brief summer as a protection against the myriads of noxious insects then warmed into life, than as a means of counteracting the rigour of a polar winter. He depends for warmth on his fur clothing, and still more on the heat-producing blubber and fat which constitute so large a portion of his food. Yet the lamp, generally made of stone, with its moss wick, and the stone kettle, play an important part among the implements and culinary apparatus of an Esquimaux's hut. On those he depends for his supply of water from melted snow, for thawing and drying his clothes, and for cooking; and without the light of the lamp the indoor life of the long unbroken arctic night would be spent as in a living tomb. The Esquimaux generally possess a piece of iron pyrites and of quartz. These serve them for flint and steel, with which they ignite a tuft of dried moss frayed in the hand. But they are also familiar with the more laborious fire-making process by means of friction, which is in general use throughout America.

At the opposite extremity of the Continent lies Tierra del Fuego, the natives of which are exposed to still greater privations, and have been pronounced by observant voyagers as among the most degraded of savage races. Yet the Fuegians exhibit considerable ingenuity in constructing their fishing tackle, slings, bows and stone-tipped arrows, stone knives, and javelins pointed with bone. A bone harpoon in use by them, barbed only on one side (Fig. 33), resembles examples already referred to found in the Dordogne and other caves of the era when the mammoth and its hunters existed together in Southern France. M. Lecoq de Boisbeaudrau suggests that the deflection of

the harpoon so formed serves as an equivalent for the refraction of the fish in the water, and thus the fisherman secures an unerring aim. If so, it furnishes an ingenious application of the fruits of experience directed to rectify a difficulty common to the modern Fuegian and to the Troglodyte of post-glacial times.

The canoes of the Fuegians are rudely constructed of bark sewed together with prepared sinews. In the bottom a hearth of clay is made, on which they habitually keep a fire alight. They too have learned the value of iron pyrites, and with its help readily obtain the spark required for igniting their prepared tinder of dried moss or fungus. Captain Weddell states that he produced the tinder-box in presence of a party of Fuegians, in order to ascertain how fire is obtained by them, and presently he discovered that his steel had been purloined. This, however, he recovered, and after sending the culprit to his canoe with threats of punishment, he learned that they procure fire by rubbing iron pyrites and a flinty stone together, catching the sparks in a dry substance resembling moss.[58]

The ancient use of pyrites for fire-making is supposed to be embodied in its etymology (πῦρ). Mr. John Evans has pointed out that the lower beds of the same English chalk in which the flint abounds are prolific of pyrites; and he makes the suggestion that the use of a nodule of pyrites for a hammer-stone in the process of manufacturing flint implements, may have led to the discovery of this method of producing fire. But if so, it is a discovery of remote antiquity, for such nodules have been found both in French and Belgian caves, associated with the bones of fossil mammals and worked flints of the palæolithic era. They also occur in the Swiss lake-dwellings, as at Robenhausen, along with

neolithic implements.

But pyrites is not always available; and Esquimaux, Fuegians, and Australians practise also the more usual, and probably the more ancient, method of producing fire by friction. The process among the Tahitians and South Sea islanders is pursued in the laboriously artless fashion of rubbing one piece of wood against another; though it is said that, with perfectly dry wood, they obtain fire in this way in two or three minutes. Australian fire-making is effected in nearly the same way; but the American Indians have improved on the process by the use of the bow and drill. Among the Iroquois and other tribes, the drill was provided with a stone whorl, or fly-wheel, to give it momentum; and when rapidly revolved by means of a bow and string, with the point resting on a piece of dry wood, surrounded with moss or punk, sparks are produced in a few seconds, and the tinder is ignited.

The art of fire-making is thus found in use among savage nations, even in the most degraded state: as among the Fuegians, whose wretched condition and repulsive appearance and habits have led travellers to describe them as scarcely human. They are indeed in every way inferior to the Esquimaux. Yet their implements and weapons display remarkable ingenuity and skill; and the origin of the name of their desolate region is traced to the numerous fires seen by the first Spanish discoverers who navigated its coasts.

The aborigines of Australia rival the Fuegians alike in physical and intellectual degradation; but, like them also, have achieved or perpetuated the discovery which lies at the very foundation of all possible civilisation. According to the inconsequential account furnished by a native

Australian of their first acquisition of fire:—"A long, long time ago a little bandicoot[59] was the sole owner of a fire-brand, which he cherished with the greatest jealousy. So selfish was he in the use of his prize, that he obstinately refused to share it with the other animals. So they held a general council, where it was decided that the fire must be obtained from the bandicoot either by force or strategy. The hawk and pigeon were deputed to carry out this resolution; and after vainly trying to induce the fire-owner to share its blessings with his neighbours, the pigeon, seizing, as he thought, an unguarded moment, made a dash to obtain the prize. The bandicoot saw that affairs had come to a crisis, and, in desperation, threw the fire towards the river, there to quench it for ever. But, fortunately for the black man, the sharp-eyed hawk was hovering near, and seeing the fire falling into the water, with a stroke of his wing he knocked the brand far over the stream into the long dry grass of the opposite bank, which immediately ignited, and the flames spread over the face of the country. The black man then felt the fire, and said it was good."[60]

The discovery of the art of fire-making, prefigured in this rude myth, is intimately associated in the minds of the Australian aborigines with their distinctive ideas of man. According to the mythology of the Booroung tribe, inhabiting the Mallee country, on Lake Tyrill, they were preceded on the earth by a race of Nurrumbunguttias, or old spirits, who had the knowledge of fire; but these were translated to heaven before the black man came into existence. One of them, named *War*, or the Crow,—the Australian Prometheus,—is now the star Canopus; and he it was who first brought fire back to earth, and gave it to the black men.[61]

It is a noticeable fact that, while the Maoris of New Zealand use the same word, *ahi*, for fire, which under slight modifications is employed through widely severed island groups of the Pacific: different Australian tribes use distinct names for it, as *darloo* at Moreton Bay, *koyung* at Lake Macquarrie, and *kaubi* at Bathurst. In the Kamilarai of Wellington Valley it is called *koyan*; while in the Wiradurei, spoken about 200 miles inland from Lake Macquarrie, it is *win*. Such diversity of names for the common acquisition proves that fire is no recent novelty derived from a single source by the savage tribes of that strange southern continent.

Amid all the remarkable evidence recently disclosed relative to the antiquity and the rude arts of primitive man, nothing has yet appeared suggestive of a condition inferior to the savages of Tierra del Fuego or Australia; while much tends to an opposite conclusion. Alike in physical development and in arts, the Troglodytes of the Dordogne caves were undoubtedly far in advance of either; and yet they were the contemporaries of the mammoth, the Siberian rhinoceros, the cave- lion and bear, the gigantic Irish elk, the reindeer, and the fossil horse of Central Europe,—the men of a period separated from our own by epochs the duration of which can be gauged by no standards of historical chronology. It could scarcely admit of doubt that such men were capable of achieving the art of fire-making. It might even be questioned if they could have subsisted under the conditions of life marking that post-glacial epoch without the use of fire. But on this subject we are not left to conjecture.

The contents of the Aurignac cavern, in the department of the Haute-Garonne, at the foot of the Pyrenees, were at first supposed to disclose a

singularly interesting example of sepulture contemporaneous with the fossil mammals of the drift; and accompanied not only with implements and personal ornaments fashioned from their bones and tusks, as well as others of flint; but with the ashes of the funeral fires and the débris of the funeral feast which formed a part of the last rites to the dead. Unfortunately some discredit has been cast on the evidence which seemed to indicate that the remains of extinct mammalia, and those of the entombed dead, were contemporaneous; and the importance of the deductions which this discovery seemed to justify render it all the more needful that the proof should be indisputable. But the practice of regular interment of the dead, accompanied with some funeral rites, by the men of the post-glacial age, is suggested by the contents of the sepulchral recess of Cro-Magnon, in the valley of the Vézère. No ashes of funeral fires can be pointed to, but the traces of the use of fire are abundant.

Throughout the floors of various caves in this district which have been rich in disclosures of primitive art, particles of charcoal abound at every level where broken bones occur, suggesting that fires were in daily use, and were employed for cooking much more than for warmth. Possibly, indeed, those caverns were only the summer dwellings of the Drift-Folk of post-glacial times; and with them, as with the Esquimaux, and the Indians of North America generally, fire may have been valued as a protection against the noxious insects which, especially in the brief summer of a rigorous climate, render life intolerable. Fire is the universal servant of man. The Esquimaux and the Red Indian ward off the mosquito, the black-fly, and the sand-fly by means of a “smudge” made with the smoke of grass and green-

wood; while the Hottentot or Bushman kindles his night-fire in the tropics as the most effectual guardian against beasts of prey. Everywhere, and at all epochs, fire appears as one of the most characteristic indices of rational man; and as we study such traces of him as reappear for us in the works of art and the extinguished fires of the Moustier and Madelaine cave-dwellings, or those of the neolithic, if not an earlier period of the Aurignac catacomb, we see the unmistakable evidences of human intelligence; and anew concur in the decision of Columbus, that the night-torch of the Guanahanè savage was indisputable proof that the unknown world which lay before him was the habitation of man.

It may be doubted if man has anywhere existed without the knowledge of fire. By means of it some of his earliest triumphs over nature have been achieved. With its aid his range is no longer limited to latitudes where the spontaneous fruits of the earth abound at every season. The use of fire lies at the root of all the industrial arts. The friendly savages found by Columbus on the first-discovered island of the New World were armed with wooden lances, hardened at the end by its means. The most civilised among the nations conquered by Cortes and Pizarro, had learned by the same means to smelt the ores of the Andes, and make of their metallic alloys the tools with which to quarry and hew the rocks, to sculpture the statues of the gods of Anahuac, and the palaces and temples of the Peruvian children of the sun. Without fire the imperfect implements of the stone period would be altogether inadequate to man's necessities. By its help he fells the lofty trees, against which his unaided stone hatchet would be powerless. It plays a no less important part in preparing the log-

canoe of the savage, than in propelling the wonderful steamship, by means of which the great lakes and rivers of the New World have become the highways of migrating nations.

A common root-word for fire serves to connect numerous scattered insular races of the great Pacific archipelagos, through their intercourse with the Malay voyagers. Yet while the Malay word *ápi* may be taken as the source of many diversified forms of the insular term for fire, the Papuans, rather than the Malays, present the ethnical peculiarities predominant throughout Polynesia, and characteristic of the Maoris of New Zealand; and distinct roots in many intermediate island vocabularies prove the independent knowledge of fire. The Vitian is rich in terms for light, warmth, shining, kindling, burning, boiling, etc. *Aundre*, to shine or flame, becomes *oundreva*, to kindle, and *vakaundre*, to cause to burn. From *yame*, the tongue, is made, by a familiar analogy, *yame-ni-mbuka*, a flame of fire. *Ilgatu*, fire, begets a group of words, including *ilgilaiso*, charcoal, and *ilgilaisongawa*, hot cinders. *Liva*, a flash of lightning, gives *lavi*, to bring fire, *lovo*, a furnace, a native oven; and recalls one familiar source of the knowledge of fire: as the *asa*, the sun; *atua*, a deity, probably the sun-god; *asu*, smoke, etc., of the Rotuma dialect suggest another association of ideas common to the Old and New World.

The fire-worship of the Ghebirs is but a degraded form of that homage to visible divinity with which man worships the god of day, and bows down before the heavenly host. Among the civilised nations of the New World, accordingly, a peculiar sanctity was associated with the familiar service of fire. At the close of the great cycle of the Aztecs, when the

calendar was corrected to true solar time at the end of the fifty-second year, a high religious festival was held, on the eve of which they broke in pieces their household gods, destroyed their furniture, and extinguished every fire. In the reconstruction of the ritual calendar, the intercalated days were held as though non-existent, and dedicated to no gods: on which account they were reputed unfortunate. At the end of that dreary interval of fasting and penitence, during which no hearth smoked, and no warm food could be eaten throughout the land, the ceremony of the new fire was celebrated. After sunset the priests of the great temple went forth to a neighbouring mountain, and there, at midnight, the sacred flame was rekindled, which was to light up the national fires for another cycle. The process by which it was procured, by revolving one piece of dry wood in the hollow of another, is repeatedly illustrated in the Mexican paintings of Lord Kingsborough's work. But, true to the bloody rites of the national faith, at this sacred festival the fire was kindled on the breast of a human victim, from whence the reeking heart was immediately afterwards torn out, and cast as a bloody offering to the gods. The period from the extinction to the rekindling of the sacred flame was one of great suspense. With a superstitious feeling, in striking accordance with the customs and ideas of the northern Indians, the women remained confined to their houses, with their faces covered, under the belief that if they witnessed the ceremony they would be forthwith transformed into beasts. Meanwhile, the men gathered on the terraced roofs, and looked forth in dread suspense into the darkness. The flames on the summits of the great teocallis, which lighted up the city at all other seasons, had been extinguished; and if the priests failed to

rekindle them, it was believed that the night must be eternal, and the world would come to an end. But dimly, through the darkness, a spark was seen to glimmer on the distant summit of the mountain, and from thence it was swiftly borne to the temple, towards which the worshippers turned with renewed hope. As the sacred flame again blazed on the high altar, and was distributed to the other teocallis, shouts of triumph ascended with it to the sky. Feasts, joyous processions, and oblations at the temples followed, and were prolonged through a festival of thirteen days, devoted to a national jubilee for the recovered flame, the type of a regenerated world.[62] The long interval which transpired between this closing rite of the great cycle was of itself sufficient to give it an impressive sanctity in the eyes of the Aztec worshipper. He who witnessed it in youth saw it only once again as life drew towards a close; whilst few indeed of all who rejoiced at the renewed gift of fire could expect to look again on the strangely significant rite. Compared with the annual miracle of the Greek Church in the crypt of the Holy Sepulchre, to which it bears some resemblance, the great festival of the Aztecs was replete with significance and solemn grandeur, though stained with the blood of their hideous sacrifices.

The Peruvian sun-worshippers preserved the harmony between their recurrent festivals and the true solar time, by a ruder process of adjustment than that which was devised by the remarkable proficiency of the Aztec priests in astronomical science. Nevertheless, they too had their secular festival of Raymi, held annually at the period of the summer solstice. For three days previous a general fast prevailed, the fire on the great altar of the sun went out, and in all the dwellings of the land no

hearth was kindled. As the dawn of the fourth day approached, the Inca, surrounded by his nobles, who came from all parts of the country to join in the solemn celebration, assembled in the great square of the capital to greet the rising sun. The temple of the national deity presented its eastern portal to the earliest rays, emblazoned with his golden image, thickly set with precious stones; and as the first beams of the morning were reflected back from this emblem of the sun-god, songs of triumph mingled with the jubilant shout of his worshippers. Then after various rites of adoration, preparations were made for rekindling the sacred fire. But this, with the Peruvians, was done by a process far in advance of that retained by the Aztec priests. The rays of the sun, collected into a focus by a concave mirror of polished metal, were made to inflame a heap of dried cotton; and a llama was sacrificed as a burnt-offering to the sun. Only in the case of the sky being overcast did the priests resort to friction for rekindling the altar; but the hiding of his countenance by the god of day was regarded as little less ominous than the extinction of the sacred fire, which it became the duty of the virgins of the sun to guard throughout the year. A slaughter of the llama flocks of the sun furnished a universal banquet; and, while the god was propitiated by offerings of fruit and flowers, there appear to have been some rare occasions on which the sacrifice of a human victim—a beautiful maiden or a child,—gave to this graceful anniversary a nearer resemblance to the appalling rites of Aztec worship.

Among the northern Indian tribes some faint traces of the annual festival of fire are discernible. At the sacrifice of the white dog, the New Year's festival of the Iroquois, the proceedings extended over six

days; and such were the obligations which its rites imposed on all, that if any member of a family died during the period, the body was laid aside, and the relatives participated in the games as well as the religious ceremonies. The strangling of the white dog destined for sacrifice was the chief feature of the first day's proceedings. On the second day the two keepers of the faith visited each house, and performed the significant ceremony of stirring the ashes on the hearth, accompanied with a thanksgiving to the Great Spirit. On the morning of the fifth day the fire was solemnly kindled by friction; and the white dog was borne in procession on a bark litter, until the officiating leaders halted, facing the rising sun, when it was laid on the flaming wood and consumed, during an address, which included a special thanksgiving to the sun, for having looked on the earth with a beneficent eye.[63]

There is, perhaps, no connection traceable between the various rites thus described; for it would be easy to find their parallels among ancient and modern nations. They pertained to the religious practices of the Chaldeans, to the rites of Baal, and to other early forms of idolatry. Sabaism is indeed the most natural form of false worship, commending itself by many visible tokens, as of a divine influence and power, to uninstructed man; and readily suggests the association of fire with the sun as its source. "Take ye good heed unto yourselves," says the lawgiver of Israel to the tribes in the wilderness, "for ye saw no manner of similitude on the day that the Lord spake unto you in Horeb out of the midst of the fire; lest thou lift up thine eyes unto heaven, and when thou seest the sun, and the moon, and the stars, even all the host of heaven, shouldst be driven to worship them." This worship of the sun, though

associated with ancient rites of Asiatic nations, is not therefore necessarily an evidence of the eastern origin either of the faith or of the nations of the New World. But, in the services to which it gave rise there, we have, at least, suggestive hints of the links that bind together its own ancient and modern tribes. Perhaps also they may supply a clew to the interpretation of some of the obscure sculptures still remaining on sites of the extinct native civilisation of America, and of rites once practised amid the sacred enclosures, and on the altar-mounds which give such peculiar interest to the river-terraces of the Mississippi valley.

Among the remarkable structures of the Mound-Builders, reviewed in a subsequent chapter, their explorers have been struck by the peculiarities of a certain class of mounds, erected on the most elevated summits of outlying hills. Concerning these "there can be no doubt that the ancient people selected prominent and elevated positions upon which to build large fires, which were kept burning for long periods, or renewed at frequent intervals. They appear to have been built generally upon heaps of stones, which are broken up and sometimes partially vitrified. In all cases they exhibit marks of intense and protracted heat."[64] Such indications have been supposed to mark ancient signal-stations adapted to the telegraphic system still in use among native tribes, of sending up columns of smoke as a warning that enemies are at hand. But this "putting out fire," as it is called among the Indians of the north-west, for the purposes of signal, is now accomplished by the simple process of setting the short-tufted buffalo grass in flame, and presents slight analogy to the traces of intense fires on the ancient hill-mounds, where the amount of scoriaceous material often

covers a large space several feet deep.

Perhaps greater importance is due to the employment of the same method of fire-making at the present day among the Indians of the north-west, as we see illustrated in ancient Aztec paintings; while the sun-worshippers of the southern continent had devised a totally distinct method, corresponding to that by which the Romans kindled the sacred fire. Mr. Paul Kane thus describes the process employed by the Chinooks on the Columbia River:—"The fire is obtained by means of a flat piece of dry cedar, in which a small hollow is cut, with a channel for the ignited charcoal to run over; on this the Indian sits to hold it steady, while he rapidly twirls a round stick of the same wood between the palms of his hands, with the point pressed into the hollow. In a very short time sparks begin to fall through the channel upon finely frayed cedar-bark placed underneath, which they soon ignite. There is a great deal of knack in doing this, but those who are used to it will light a fire in a very short time. The men usually carry these sticks about with them, as after they have been once used they produce the fire more quickly."[65] I witnessed the process successfully employed under the most unfavourable circumstances, on one occasion when camping out with Chippewa guides on the Lake of Bays, in Western Canada. We had struck our tents, and were making our way down the river, when a steady rain set in, which continued throughout the day. We had to pass several long portages, involving in each case the unloading, and carrying over them, our canoes and baggage; and on one of these occasions, finding myself alone with my Indian guide at the foot of a portage where we must necessarily be detained a considerable time, I suggested to him by words and signs, whether it

were possible to kindle a fire. Rain was falling in torrents, the trees were dripping, and the grass and fallen leaves resembled a soaked sponge. But Kineesè set to work in Indian fashion, hunted out a pine-knot, such as are of common occurrence in the Canadian forest, where the tree itself has rotted away and left the cores of its oldest branches like pins of iron. Having secured this, and a piece of half-burned wood from under the remains of an old camp-fire, he next stripped off the bark from the lee-side of a birch tree, and collecting a heap of the dry inner bark, thin as paper, he carefully disposed it under a cover of pine-bark, and placed over all a pile of chips cut with his axe from the centre of a pine log. All being now ready, he frayed a handful of the birch-bark into the consistency of tow, and placing this on the charred wood, he made the hard point of the pine-knot revolve in the wood by means of a cord, while his bent position, pressing the other end to his breast, protected it from the rain. In a surprisingly short time he blew the tinder into a flame, applied it to the pile he had prepared, and nursing this with chips and dry twigs, we were able to welcome our companions to a blazing log fire, kindled under circumstances which, even with the aid of flint and steel, would have seemed impossible to the European woodsman.

The knowledge of this simple process, however acquired, constitutes perhaps the oldest of all human traditions relating to the arts of life. A mode of obtaining fire nearly equivalent to that of flint and steel has already been referred to as in use both among the Fuegians and Esquimaux; but the process of friction is also resorted to by the latter, and with slight variations in the application of the principle, it appears to be the recognised Indian mode of procuring fire. Among all the Indian tribes not only

was a certain superstitious sanctity attached to fire, but they looked with distrust on the novel methods employed by Europeans for its production. When, in 1811, Elksatowa, the prophet of the Wabash,—a brother of Tecumseh, the Shawnee warrior,—was exhorting his tribe to resist the deadly encroachments of the white man, he concluded one of his eloquent warnings by exclaiming: “Throw away your fire-steels, and awaken the sleeping flame as your fathers did before you; fling away your wrought coverings, and put on skins won for yourselves as was their wont, if you would escape the anger of the Great Spirit.” Nor is there wanting among many Indians a conviction that the Ishkodaiwaubo, or fire-liquid, is a malignant form of the same mysterious element; an evil medicine wrought for their destruction by the white Manitou.

Various methods are thus traceable throughout the western hemisphere for calling into existence the wondrous element, so peculiarly distinctive of man. Yet even in these, common relations of a very comprehensive character are apparent; while the Peruvian, with the solar mirror, stands apart alike from the rude Indian and the cultivated native of the Mexican plateau; and far to the south of both, the Fuegian finds in the natural products of his inhospitable clime a means of fire-making analogous to that which the Shawnee prophet taught his people to regard as one of the unhallowed practices of the Whites. All alike exhibit man, even in the rudest stage, master of the same secret; and turning to many useful, and even indispensable purposes, that which no other animal can be taught to use, or scarcely even to look upon without dread.

[57] Floureus, *De la Longévité Humaine*, p. 127.

[58] Weddell's *Voyage towards the South Pole in 1822-24*, p. 167.

[59] A small sharp-nosed animal, not unlike the Guinea-pig.

[60] *Canadian Journal, N.S.*, vol. i. p. 509.

[61] *Trans. Philosoph. Institute, Victoria*, vol. i.

[62] *Clavigero*, vol. ii. p. 84.

[63] *League of the Iroquois*, pp. 207-221.

[64] *Ancient Monuments of the Mississippi Valley*, p. 183.

[65] *Wanderings of an Artist among the Indians of North America*, p. 188.

CHAPTER VI.

THE CANOE.

THE USE OF TOOLS—TOOL-USING INSTINCT—RUDIMENTARY STAGE OF ART—PRIMITIVE RIVER-CRAFT—THE GUANAHANÈ CANOE—OCEAN NAVIGATION—AFRICAN CANOE-MAKING—OREGON CEDAR CANOES—NATIVE WHALERS OF THE PACIFIC—PREHISTORIC BOAT BUILDERS—MAWAI'S CANOES—THE POLYNESIAN ARCHIPELAGO—THE TERRA AUSTRALIS INCOGNITA—CANOE-FLEETS OF THE PACIFIC—PRIMITIVE NAVIGATION—PORTABLE BOATS—THE CORACLE AND KAIAK—THE PERUVIAN BALSA—OCEAN NAVIGATORS.

The discovery of fire, and its application even to such simple purposes of art as the hardening of the wooden spear, or the hollowing of the monoxylous canoe, suffice to illustrate the characteristics of man, not merely as a reasoning, but also as a tool-using, or, as Franklin defined him, a tool-making animal. Whilst, however, an innate instinct seems to prompt him to supplement his helplessness by such means, mechanical science, the industrial and the fine arts, are all progressive developments which his intellect superinduces on that tool-using instinct. And through all the countless ages revealed to the geologist, with ever new orders of successive life; with beast, bird, crustacean, insect, and zoophyte, endowed with wonderful constructive instincts, and perpetuating memorials of architecture and sculpture, of which the microscope is alone adequate to reveal the exquisite beauty and infinite variety of design: yet so thoroughly is the use of tools the exclusive attribute of man, that the discovery of a single artificially shaped flint in the drift or cave-breccia, is deemed proof enough that man has been there. The flint implement or weapon lies beside bones revealing species kindred to the sagacious elephant, or to those of carnivora allied to the dog, with its wonderful instincts bordering on reason and the forethought of experience; yet no theorist dreams of the hypothesis that some wiser *Elephas primigenius*, in advance of his age, devised the flint-spear wherewith to oppose more effectually the aggressions of the gigantic carnivora, whose remains abound in the ossiferous caverns.

But if man was created with a tool-using instinct, and with faculties capable of developing it into all the mechanical triumphs which command such wonder and admiration in our day, he was also

created with a necessity for such. “The heritage of nakedness, which no animal envies us, is not more the memorial of the innocence that once was ours, than it is the omen of the labours which it compels us to undergo. With the intellect of angels, and the bodies of earth-worms, we have the power to conquer, and the need to do it. Half of the industrial arts are the result of our being born without clothes; the other half of our being born without tools.”[66]

With the growing wants of men as they gathered into communities, novel arts were developed; and the demands of each new-felt want called into being means for its supply. Artificers in brass and iron multiplied, and the sites of the first cities of the earth were adorned with temples, palaces, sculptured marbles, and cunningly-wrought shrines. But whenever communities were broken up and scattered, the elements of an acquired civilisation were inevitably left behind. All but the most indispensable arts disappear during the process of migration; and although the wanderers might at length find a home in “a land whose stones are iron, and out of whose hills thou mayest dig brass,” no arts are so speedily lost among migratory tribes as those of metallurgy. The hold of the accumulated wisdom and experience of successive generations must be partial and uncertain among an unlettered people, dependent on tradition for all knowledge excepting such as is practically transmitted in the operations of daily experience. Few indeed of all the wanderers from the old centres of European civilisation to the wilds of the New World bring with them the slightest knowledge either of the science or the practice of metallurgy. Every chemical analyst knows what it is to receive pyrites for silver, and ochres for iron or gold. Even now the skill of the

American miner has to be imported, and the copper-miners of Lake Superior are chiefly derived from Cornwall, Norway, or the mining districts of Germany.

With all our many artificial wants so promptly supplied, even in the remotest colony, we are slow to perceive how much we owe to the wondrous appliances of modern civilisation, and its division of labour. The Dutchman exported his very bricks across the Atlantic, wherewith to found his New Amsterdam on the banks of the Hudson; and the English colonist, with enterprise enough to mine the copper and iron of Lake Superior, still seeks a market for the ores in England, and imports from thence both the engineers and the iron wherewith to bridge his St. Lawrence. With such facts before us in relation even to the systematic colonisation of a highly civilised and enterprising commercial nation, it is easy to understand what must have been the condition of the earth's primeval wanderers. Their industrial arts were all to begin anew; and thus we see that the non-metallurgic condition of primitive social life which is designated its Stone Period, is not necessarily the earliest human period, but only the rudimentary state to which man had returned, and may return again, in the inevitable deterioration of a migratory era.

Evidence of various kinds still points to a cradle-land for the human family towards the western borders of Central Asia, and remote from its coasts: probably in that range of country stretching between the head-waters of the Indus and the Tigris. The earliest history of man that we possess represents the postdiluvian wanderers journeying eastward, and at length settling on a plain that long afterwards remained one of the chief centres of history. But the

arts there developed belonged exclusively to a far inland people; and to this day the rude craft of the Tigris and the Euphrates betrays a total absence of maritime instinct or skill in navigation. The highest effort of their boat-builders is little more than to construct a temporary raft, on which themselves and their simple freight may float in safety down the current of the great river. Similar rafts are still in use by the Egyptians, formed of earthenware jars bound together by withes and cords, and covered with bulrushes. Like the corresponding river-craft of the Euphrates, these are steered down the Nile, never to return; for, on their arrival at Cairo, the rafts are broken up, and the jars sold in the bazaars. Such was the rudimentary condition of navigation in that great Asiatic hive of nations where man chiefly dwelt for centuries remote from the sea. But from thence the wanderers were scattered over the face of the whole earth. The primitive river-craft, therefore, found an early development into sea-craft; and oceanic migration gave a new character to the wanderings of the primeval nomads. Thenceforth, accordingly, those instinctive tendencies began to characterise certain branches of the human family, as leaders of maritime enterprise, which may be traced under very diverse degrees of social development: as in the Phœnicians, the Northmen, the Malays, and the Polynesians; while other tribes and nations, such as the Celts and the Fijians, though living on the coast, are tempted by no longings to voyage on the ocean's bosom.

The islands of the Central American archipelago were the first to reward the sagacity of Columbus, as he steered his course westward in search of the old East. The arts of their simple natives accordingly attracted his attention; and although he found among

them personal ornaments of gold, sufficient to awaken the avaricious longings of the Spaniards for that fatal treasure of the New World, yet practically they were in ignorance of metallurgic arts, and lacked that stimulus to ingenious industry which the requisites of clothing call forth in less genial climes. The natives of Guanahanè, or San Salvador, were friendly and gentle savages, in the simplicity, if not in the innocence, of nakedness. Their only weapons were lances of wood hardened in the fire, pointed with the teeth or bone of a fish, or furnished with a blade made either of the universal flint, or more frequently, with them, from the large tropical shells which abound in the West Indian seas. They had learned to turn the native cotton-plant to economical account; but their chief mechanical ingenuity was expended on the light barks to which they gave the now universal name of *canoe*. These were formed from the trunk of a single tree, hollowed by fire, with the help of their primitive adzes of flint or shell, and were of various sizes, from the tiny bark only capable of holding its solitary owner, to the galley manned by forty or fifty rowers, who propelled it swiftly through the water with their paddles, and baled it with the invaluable native calabash, which supplied every domestic utensil, and rendered them indifferent to the potter's art.

The canoe has a peculiar interest and value in relation to the archæology of the New World. With our wondrous steamships, wherewith we have bridged the Atlantic, we are apt to lose faith in the capacity of uncivilised man for overcoming such obstacles as the dividing oceans which had so long concealed America from the ancient world. But the bark in which Columbus first crossed the Atlantic was in no degree more capable of braving the

ocean's terrors than the navies of the Mediterranean had been a thousand years before; and the primitive canoes of the American archipelago far more nearly resembled the Pinta, or the Niña with its lateen sails, than the smallest of our modern ocean craft.

Throughout the Polynesian archipelago, fragments of foreign vocabularies are the chief traces of that oceanic migration by which alone the descendants of a common race could people those distant islands of the sea. The recognition of certain Malay and Polynesian words in the language of the remote island of Madagascar is one striking illustration of what such intrusive linguistic elements imply. We can thus trace the primitive voyagers, in their *praus*, or slight Malayan vessels, navigating an ocean of three thousand miles; and perceive how, even by such means, the ocean highway was open to the world's grey fathers in remotest prehistoric times.

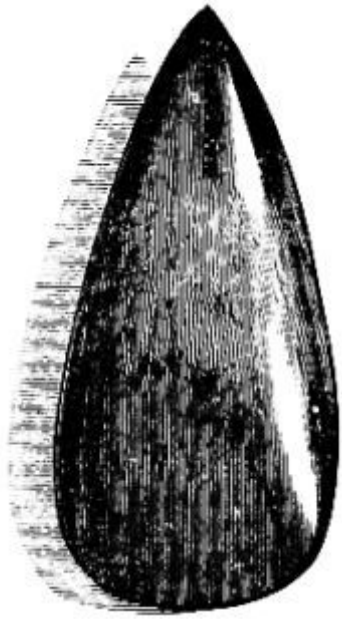


FIG. 50.—Clyde Stone Axe.

In this view of the case, the canoe of America is the type of a developed instinct pregnant with many suggestive thoughts for us; and the traces of the primeval ship-builder's art accumulate wonderfully so soon as attention is drawn to it. On the banks of the Clyde, the voyager from the New World looks with peculiar interest on the growing fabrics of those huge steamers, which have made the ocean, that proved so impassable a barrier to the men of the fifteenth century, the easy highway of commerce and pleasure for us. The roar of the iron forge, the clang of the fore-hammer, the intermittent glare of the furnaces, and all the novel appliances of iron ship-building, tell of the modern era of steam; but, meanwhile, underneath these very ship-builders' yards lie the memorials of ancient Clyde fleets, in

which we are borne back, up the stream of human history, far into prehistoric times. The earliest recorded discovery of a Clyde canoe took place in 1780, at a depth of twenty-five feet below the surface, on a site known by the apt designation of St. Enoch's croft. It was hewn out of a single oak, and within it, near the prow, lay a beautifully finished stone axe or celt, represented here (Fig. 50), doubtless one of the simple implements with which this primitive ship of the Clyde had been fashioned into shape. At least sixteen other canoes have been since brought to light; some of them buried many feet underneath sites occupied by the most ancient structures of the city of Glasgow. It is difficult to apply any satisfactory test whereby to gauge the lapse of centuries since this primitive fleet plied in the far-inland estuary that then occupied the area through which the Clyde has wrought its later channel; but that the changes in geological, no less than in technological, aspects indicate a greatly prolonged interval, cannot admit of doubt. Yet primitive man, alike in Africa and in the New World, is still practising the rude ingenuity of the same boat-builder's art which the allophylian of the Clyde pursued in that remote dawn.

The vessel in which Captain Speke explored Lake Tanganyika was a long narrow canoe, hollowed out of the trunk of a single tree. "These vessels," he says, "are mostly built from large timbers, growing in the district of Ugubha, on the western side of the lake. The savages fell them, lop off the branches and ends to the length required, and then, after covering the upper surface with wet mud as the tree lies upon the ground, they set fire to, and smoulder out its interior, until nothing but a case remains, which they finish by paring out with roughly constructed hatchets."

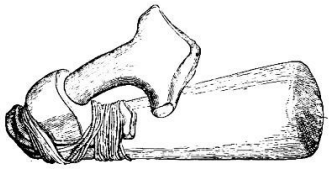


FIG. 51.—Clalam Stone Adze.

The islanders of the Southern Ocean, the natives of many parts of the African continent, and the canoe-builders of the New World, all employ the agency of fire to supplement their imperfect tools. The stone axe of the St. Enoch's croft canoe is formed of highly polished dark greenstone. It measures five and a half inches in length by three and a half in breadth; and an unpolished band round the centre indicates where it had been bound to its haft, leaving both ends disengaged, as is frequently the case with the stone hatchets of the American Indians and the Polynesians. But the accompanying woodcut (Fig. 51) drawn from one brought by Mr. Paul Kane from the Strait of De Fuca, shows a more ingenious mode of hafting the stone adze. Such implements are in use by the Clalam Indians for constructing out of the trunks of cedar trees, large and highly ornamented canoes, in which they fearlessly face the dangers of the Pacific Ocean. Some of their canoes, made out of a single tree, measure upwards of fifty feet long, and are capable of carrying thirty as a crew. They have thwarts from side to side, about three inches thick, and their gunwales curve outwards so as to throw off the waves. The bow and stern rise in a graceful sweep, sometimes to a height of five feet, and are decorated with grotesque figures of men and animals. The Indian crew kneel two and two along the bottom, and propel the canoe rapidly with paddles from four to five feet long, while a bowman and steersman sit, each with his paddle, at either

end, and thus equipped these savages venture in their light bark upon the most tempestuous seas. One of their most coveted prizes is the whale, the blubber of which is eaten along with dried fish, and esteemed no less highly by them than by the Esquimaux. Since the encroachments of European settlements on their territories their game has greatly diminished, and few whales approach the coast; but, when an opportunity offers, the Indians are enthusiastic in the chase, and the process by which their prize is secured furnishes an interesting illustration of native ingenuity and daring. When a whale is seen blowing in the offing, they rush to their canoes and push off, furnished with a number of large sealskin bags filled with air, each attached by a cord to a barbed spear-head, in the socket of which is fitted a handle five or six feet long. Upon coming up with the whale, the barbed heads are driven into it, and the handles withdrawn; until the whale, no longer able to sink from the buoyancy of the air-bags, is despatched and towed ashore. By just such a process may the whale have been stranded at the base of Dunmyat, in times when an ancient ocean washed the foot of the Ochil hills, and the old Scottish whaler revelled in spoils such as now reward the enterprise of the savages of the North Pacific coast.

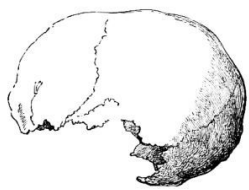


FIG. 52.—Grangemouth Skull.

It is thus seen to how large an extent the primitive canoe may have sufficed for remote ocean

expeditions. The old navigators of the Clyde were probably not a whit less fearless than the native whalers of the Oregon coast; and they had to face dangers fully equal to any of those to which voyagers of the Pacific are exposed, whenever they navigated the lochs and island channels towards its mouth, or ventured beyond it, to face the gales and currents of the Irish Sea. The Clyde has supplied an unusually rich store of illustrations of primitive ship-carpentry; but the disclosures of another Scottish locality also merit notice here. The carse of Falkirk is intimately associated with some very memorable events of Scottish history. It is traversed by the vallum and chain of forts reared by Lollius Urbicus the Roman proprætor of Antoninus Pius in the early part of the second century, and is rich in memorials of many later incidents. But underneath lie far older records. In the year 1726, a sudden rise of the river Carron undermined a portion of its banks, and exposed to view a canoe of unusually large dimensions, fashioned with care from a single oak tree, and lying at a depth of fifteen feet beneath successive strata of clay, shells, moss, sand, and gravel. The Statistical Accounts record the discovery, in the vicinity of Falkirk, of another ancient boat buried thirty feet below the surface, in the same carse from which the remains of a mammoth were exhumed in excavating the Union Canal in 1821. Those traces of primitive human art have already been referred to in the *Prehistoric Annals of Scotland*, but a further discovery in the same locality confers a fresh interest upon them. Soon after the publication of that work, when on a visit to Falkirk, I was shown by Dr. G. Hamilton a human skull, which at once attracted my attention from its marked correspondence to the brachycephalic crania of ancient British graves. It is

figured here, Fig. 52, from a careful drawing executed at a later date. The facial bones and the whole of the base are wanting, but enough remains to show that it is well developed, according to a type of crania of the early Scottish tumuli. But what confers a special interest on it is, that it was found in the same alluvial carse-land as the ancient canoes and the fossil bones of the *Elephas primigenius*, twenty feet below the surface, in a bed of shell and gravel, when digging the area of the large Grangemouth lock of the Union Canal, on the 29th of June 1843. Buried at such a depth in the detritus of the river-valley, it may be regarded as a record of the men of the period when the valleys of the Forth and Carron were navigable arms of the sea; and may even belong to the epoch when their shores were peopled by a race of fishermen contemporaneous with the whalers of Dunmyat and Blair-Drummond Moss, and with the monoxylous boatmen of the Clyde.

Among many of the islands of the Southern Ocean the boats are simple wooden canoes, pointed at either end, and propelled through the water with the paddle; but the barks of the true Polynesians are more elaborate and ingenious. They frequently are double, with a raised platform or quarter-deck; and are invariably provided with an outrigger, an article seemingly of Malay origin. So essential, indeed, is the latter deemed for safe navigation, that the most remarkable characteristic recognised by the Tahitians, when Captain Cook's vessels first revealed to them the wonders of European civilisation, was the want of the indispensable outrigger. Throughout the mythology of oceanic Polynesia, Mawai, the upholder of the earth, and the revealer of the secrets of the future, plays a prominent part. In one of his prophecies, Mawai foretold that a ship such as had

never been seen before, a canoe without outriggers, should in process of time come out of the ocean. But to the mind of a Tahitian, an ocean canoe without an outrigger was so impossible a thing that they laughed their prophet to scorn: whereupon Mawai launched his wooden dish on the waters, which swam without outrigger, and the Tahitians thenceforward looked for the strange marvel of the outriggerless canoe. Cook's ship was regarded as the fulfilment of Mawai's prediction, and still English vessels are frequently called Mawai's canoes. The mythic prophecy seems in reality one of those vague traditions of ancestral intercourse with other members of the human family, such as, among the Aztecs, led to the belief that the ships of Cortes had returned from the source of the rising sun with Quetzalcoatl, the divine instructor of their forefathers in the arts of civilisation.

The population of the great Polynesian archipelago presents many highly interesting and suggestive features, bearing closely on the question of oceanic migration. The area of Polynesia proper extends from the small islands westward of the Pelews to Easter Island, and from the Mariannes and the Sandwich Islands to New Zealand on the south. In Tongatabu and Easter Island, as well as in the Micronesian Rota, Tinian, Ualan, and throughout the Caroline group, remains of massive stone buildings, the origin or use of which is wholly unknown to the natives, reveal traces of an extinct civilisation, and afford some possible clew to the strange ethnological phenomena of the Oceanic archipelago. Professor Dana, who, as geologist to the United States Exploring Expedition, had abundant opportunities for observation, came to the conclusion that an immense area in the Pacific has for ages been gradually

subsiding; and that the numerous Lagoon Islands mark the spots where what were once the highest peaks of mountains have finally been submerged. Mr. Hale, the philologist of the same expedition, gathered sufficient data from a European who had been resident for a time on the island of Bonabe, in the Caroline archipelago, and from his own observations, to satisfy him that the remarkable stone structures, both Ualan and Bonabe, were erected when the sites on which they stand were at a different level from what they now occupy. “At present they are actually in the water; what were once paths, are now passages for canoes, and when the walls are broken down the water enters the enclosure.”

Such an idea seems like a glimpse of far-reaching truths relative to the unwritten history of that recently explored Southern Ocean. When Columbus discovered the islands of the New World he found them lying in thickly clustered groups, and ere long he reached the mainland of a great continent, which lay in close vicinity to its island satellites. But it was altogether different with the Columbus of the Southern Ocean. A strange Antarctic, as well as an Australian continent lay there also, awaiting new discoverers; but far beyond their coasts the Pacific and Southern groups dotted the wide expanse of ocean like the stars that lose themselves in the abysses of night. We read with wonder, as strange as that which rewarded the revelations of the Western Ocean in the closing years of the fifteenth century, of the voyages and discoveries of Byron, Wallis, Carteret, and of Cook and later explorers of the South Pacific Ocean. When Captain Cook reached the Cape on his return from his second expedition, in 1774, he had sailed no less than twenty thousand

leagues, through unknown seas, since he left the same point twenty months before. His grand quest was in search of the *Terra Australis Incognita*, a continent which it was assumed must exist in the Southern Ocean, as a counterpoise to the land occupying so large a portion of the northern hemisphere; but instead of this, the voyagers sailed for days and weeks through vast seas, arriving by chance, now and again, at some little island, cut off from all the world besides, yet tenanted by human beings. And, as later voyagers have noted, on sailing once more into the limitless horizon, after another long interval, in which many hundreds of miles have been passed, another island-speck appears; and not only is it inhabited, but affinities of speech, mythology, and the primitive ingenuity of native arts, all concur in proving a community of origin. The idea suggested to the sagacious naturalist is now very familiar to the scientific mind. The Pacific Ocean is pre-eminently an area of subsidence, where already not only implements of shell and stone, but probably carvings, sculptures, and even architectural structures, lie buried under the coral breccia of a modern cretacean formation, destined it may be, to puzzle the intelligent research of a remote future, when the northern hemisphere shall once more become the area of subsidence; and the islands of the Pacific will constitute the summits of mountain-chains in the *Terra Australis* of that coming time.

We must not be misled here, any more than in our estimate of possible Atlantic voyagers, by the undue contempt with which the European is apt to gauge the capacity of primitive island mariners. At Vanikoro, the native canoe is a mere rudely-fashioned trunk of a tree, sufficiently grooved to afford foot-hold; yet to this the islander attaches an

outrigger, spreads a mat for his sail, and boldly launches forth into the ocean, though few Europeans would be induced to venture in such a craft on the stillest pool. Dr. Pickering, when illustrating the ideas of ocean migration which he was led to form from intimate observations of widely-scattered and very diverse branches of the human family, remarks: "Of the aboriginal vessels of the Pacific, two kinds only are adapted for long sea-voyages: those of Japan, and the large double canoes of the Society and Tonga groups. In times anterior to the impulse given to civilised Europe through the noble enterprise of Columbus, Polynesians were accustomed to undertake sea-voyages nearly as long, exposed to equal dangers, and in vessels of far inferior construction. However incredible this may appear to many, there is sufficient evidence of the fact. The Tonga people are known to hold intercourse with Vavao, Samoa, the Fiji Islands, Rotuma, and the New Hebrides. But there is a document, published before those seas were frequented by whalers and trading-vessels, which shows a more extensive aboriginal acquaintance with the islands of the Pacific. I allude to the map obtained by Forster and Cook from a native of the Society Islands, and which has been shown to contain not only the Marquesas, and the islands south and east of Tahiti, but the Samoan, Fiji, and even more distant groups. Again, in regard to the principles of navigation, the Polynesians appear to possess a better knowledge of the subject than is commonly supposed, as is shown from recent discoveries at the Hawaiian Islands. One of the Hawaiian headlands has been found to bear the name of *The starting-place for Tahiti*: the canoes, according to the account of the natives, derived

through the missionaries, leaving in former times at a certain season of the year, and directing their course by a particular star."

But leaving such glimpses of oceanic migration, there is another aspect in which the ingenuity of the primitive boat-builder of the New World is exhibited, which is highly characteristic in itself; and also worthy of notice from some of its elements of comparison with the primeval ingenuity of the ancient world. Throughout the islands of the American archipelago, and among the southern tribes, where large and freely navigable rivers abound, the native canoe was made of various sizes, but invariably of the trunk of a tree hollowed out, and reduced to the required shape. Such appears to be the normal type of the primitive mariner's craft; but where obstacles interfere with its accomplishment, the rudest races devise means to obviate the difficulty. The Californian canoe is a mere float made of rushes, in the form of a lashed-up hammock; while those of the Navigator Islands, in the Pacific,—so called by La Perouse, their first discoverer, owing to the graceful shape and superior workmanship of their canoes,—are formed of pieces of wood sewed together by means of a raised margin. In this the skilful carpenter is guided rather by utility or taste, than by necessity, for the Navigator Islands are fertile and populous, and clothed to the summits of their lofty hills with luxuriant forests and richly laden fruit-trees.

But across the wide area of the northern continent of America, which stretches from the Gulf of the St. Lawrence to the Pacific, a different combination of circumstances has given bent to the development of native ingenuity in the art of boat-building. In the St. Lawrence itself, and throughout

all its principal tributaries, navigation is constantly impeded by waterfalls or rapids, which constitute an insurmountable barrier to ordinary navigation. In like manner the country along the northern and southern shores of Lake Ontario, the valley of the Ottawa, reaching towards the Georgian Bay and Lake Superior, and much of the route between that and the Rocky Mountains, is a chain of lakes or interrupted river navigation. Hence all the principal routes of travel consist of lines of lake and river united by "portages," or carrying-places, over which the canoe and all its contents have to be borne by the native boatmen, or voyageurs, as the French Canadians and Half-breeds of the traders and Hudson's Bay Company are called. For such mode of transport the wooden canoe would be all but impracticable; and accordingly, probably ages before voyageurs of European descent had learned to handle such canoes, the native Indian devised for himself his light and graceful bark-boat, made from the rind of the *Betula papyracea*, or canoe-birch, which grows in great abundance, and where the soil is good often acquires a height of seventy feet.

Portable boats were not unknown to the ancient tribes of the British Isles. In Mr. Shirley's *Account of the Dominion of Farney* in Ulster, a curious example of a portable boat is described, formed of the trunk of an oak tree, measuring twelve feet in length by three feet in breadth, hollowed out, and furnished with handles at both ends, evidently for facility of transport from one loch to another. The district is one abounding with small lakes, such as the ancient Irish chiefs frequently selected as chosen retreats in which to construct their crannoges, or other insulated strongholds, beyond the reach of hostile surprise. But a closer analogy may be traced between

the Indian birch-bark canoe and the coracle of the ancient Briton described by Julius Cæsar as a frame of wicker-work covered with skins. The same kind of canoe is in use at the present day on the lakes in the interior of Newfoundland, where the Montagnars from the Labrador coast frequently spend the summer. Their birch canoes are carefully secured for the return voyage to the mainland; and a deer-skin stretched over a wicker frame supplies all the requisites for inland navigation. But the true counterpart to the British coracle is the Esquimaux kaiak, which consists of a light frame covered with skin; and as this is brought over the top, and made to wrap round the body of its occupant, it enables the amphibious navigator, both of the North Pacific and the Greenland seas, to brave a stormy ocean in which no open boat could live.

Hamilco, the Carthaginian, according to Festus Avienus, witnessed the ancient Britons "ploughing the ocean in a novel boat; for, strange to tell, they constructed their vessels with skins joined together, and often navigated the sea in a hide of leather." Upwards of four centuries later, Cæsar found the same stormy sea navigated by the southern Britons in their coracles. When, in the sixth century, in the lives of the Irish Saints, we once more recover some glimpse of maritime arts, it is in the same coracles—sometimes made of a single hide, and in other cases, such as the ocean currach of St. Columba, of several skins sewed together,—that the evangelists of Iona crossed the Irish sea, visited the Orkney and Shetland Islands, and even, as there is reason to believe, preceded the Northmen in the discovery of Iceland. The old Scottish historian Bellenden, writing in the sixteenth century, asks: "How can there be greater ingyne than to make a boat of a bull's hyde bound

with nothing but wands? This boat is called a currock, with which they fish, and sometimes pass over great rivers." This primitive boat is even now to be met with in the river-estuaries of Wales, and on various parts of the Irish coast: the counterpart of the Esquimaux *kaiak*, or the *baydar* with which the Aleutian Islanders navigate the intervening ocean between Asia and America. Dr. Pickering remarks, on encountering the latter to the north of the Strait of De Fuca:—"From its lightness, elegance, and the capacity of being rendered impervious to both air and water, I could not but admire its perfect adaptation to the purposes of navigation; for it seemed almost to enable man to take a place among the proper inhabitants of the deep. Such vessels are obviously fitted to cope with the open sea, and, so far as the absence of sails permits, to traverse a considerable expanse of ocean."

It is a curious fact, well worthy of notice, that throughout the American continent, seemingly so dependent on maritime colonisation for its settlement by man, the use of sails as a means of propelling vessels through the water appears to have been almost unknown. Prescott, when describing the singular suspension bridges, made of the tough fibres of the maguey, with which the Peruvians spanned the broad gullies of their mountain streams, adds: "The wider and more tranquil waters were crossed on *balsas*, a kind of raft still much used by the natives, to which sails were attached, furnishing the only instance of this higher kind of navigation among the American Indians."[67] This statement of the historian is too comprehensive; for, although the Peruvians were so essentially an agricultural and unmaritime people, the use of sails in their coasting trade constitutes one of their noticeable points of

superiority over other nations of the New World. Attention is specially directed to this by an incident recorded in the second expedition for the discovery of Peru preparatory to its conquest. Bartholomew Ruiz, the pilot of the expedition, after lingering on the coast, near the Bay of St. Matthew, stood out into the ocean, when he was suddenly surprised by the sight of a vessel in that strange, silent sea, seemingly like a caravel of considerable size, with its broad sail spread before the wind. “The old navigator was not a little perplexed by this phenomenon, as he was confident that no European bark could have been before him in these latitudes; and no Indian nation yet discovered, not even the civilised Mexican, was acquainted with the use of sails in navigation.” As he drew near, it proved to be a native *balsa*, formed of huge timbers of light, porous wood, and with a flooring of reeds raised above them. Two masts sustained the large, square, cotton sail; and a moveable keel and rudder enabled the boatman to steer. On board of it Ruiz found ornaments displaying great skill, wrought in silver and gold, vases and mirrors of burnished silver, curious fabrics, both cotton and woollen, and a pair of balances made to weigh the precious metals. Here were the first undoubted evidences of the existence of that strange seat of a native American civilisation, among the lofty valleys of the Southern Andes, which he was in search of. The balsa’s crew included both men and women, who carried with them provisions for their voyage, and had come from a Peruvian port some degrees to the south. Like older voyagers of the Mediterranean, the Peruvian pilots were wont to creep timidly along the shore; but the Spaniards encountered them in the open Pacific, where no European prow had ever sailed. Caught by a sudden

gale their bark might have been borne far off among the islands that stud the Southern Ocean, and here was the germ of a race of islanders, to whom, after a few generations, the memory of their Peruvian ancestry would have survived only as some mythic legend, like the Manco Capac of their own Incas, or the Mawai of the Polynesian archipelago.

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[66] *What is Technology? an Inaugural Lecture.* By George Wilson, M.D., Regius Professor of Technology, Edinburgh University.

[67] *Conquest of Peru*, vol. i. B. I. ch. ii.

CHAPTER VII.

TOOLS.

MAN THE ARTIFICER—THE LAW OF REASON—INDIGENOUS RACES—MAN'S CAPACITY FOR DETERIORATION—WHAT IS A STONE-PERIOD?—MATERIALS OF PRIMITIVE ART—SUCCESSION OF RACES—INDICATIONS OF ANCIENT TRADE—THE SHOSHONE INDIAN—TEXAS IMPLEMENTS—MODES OF HAFTING—DEER'S-HORN SOCKETS—STONE KNIVES—THLINKETS OF ALASKA—METALS OF A STONE PERIOD—ARTS OF THE SOUTH PACIFIC—MALAYAN INFLUENCE—FIJIAN CONSTRUCTIVE SKILL—FIJIAN POTTERY—SLOW MATURITY OF RACES—THE FLINT-EDGED SWORD—THE LEAGUE OF THE FIVE NATIONS—IROQUOIS PREDOMINANCE—WORK IN OBSIDIAN AND FLINT—HONDURAS FLINT IMPLEMENTS—SOURCES OF THE MATERIAL—COLLISION OF RACES—FATE OF INFERIOR RACES.

As the type of oceanic migration, the canoe claims a prominent place among the primitive arts of

man. In it we see the germs of commerce, maritime enterprise, and much else that is indispensable to any progress in civilisation. But the primitive ship implies the existence of tools; and, as we have seen, probably owed its earliest fashioning to the useful service of fire. Intelligent design was working out the purposes of reason by processes which, even in their most rudimentary stage, reveal the characteristics of a new order of life, compared with which the tool-born ant, the spider, and the bee, seem but as ingenious self-acting machines, each made to execute perfectly its one little item in the comprehensive plan of creation.

As industrial artificers, the creatures so far beneath us in the scale of organisation seem often to put to shame our most perfect workmanship; yet provided with no other instruments than the eye and the hand, but guided by that intelligent reason which distinguishes man from the brutes, we see him, even as an artificer, presenting characteristics which are altogether wanting in the lower animals. Labour is for them no sternly imposed necessity, but an inevitable process, having only one possible form of manifestation; producing in its exercise the highest enjoyment the labourer is capable of; and in its results leading our thoughts from the wise, unerring, yet untaught worker, to Him whose work it is, and of whose wisdom and skill the workmanship, not less than the workman, appears a direct manifestation. It is not so with man. The capacity of the workman is a divine gift, but the work is his own, and too often betrays, in some of its most ingenious devices and results, anything rather than a divine origin.

If ours be not the latest stage of being, but is to be succeeded by “new heavens and a new earth,” marvellous indeed are the revelations which posthistoric strata have yet to disclose. But even they

will scarcely suffice to reveal the most striking characteristics of a being on whom the economy of nature reacts in a way it never did on living being before; in whom all external influences are subordinated to an inner world of thought, by means of which he is capable of searching into the past, anticipating the future, of looking inward, and being a law unto himself. His nature embraces possibilities of the widest conceivable diversity, for his is no longer the law of instinct, but of reason: law, therefore, that brings with it conscious liberty, and also conscious responsibility.

But an important and seemingly conflicting element arises out of the capacity of man for moral progression, to which some ethnologists fail to give due weight. A suggestive thought of Agassiz, relative to certain real or supposed analogies between the geographical distribution of species of simiæ, and especially the anthropoid apes, and certain inferior types of man, sufficed as the nucleus of Gliddon's elaborate monkey-chart, in the *Indigenous Races of the Earth*, illustrative of the geographical distribution of monkeys in relation to that of certain types of men. Notwithstanding the very monkeyfying process to which some of the illustrations of inferior human types have been subjected in this pictorial chorography, the correspondences are not such as to carry conviction to most minds. But, assuming, as a supposed *reductio ad absurdum*, the descent of all the diverse species of monkeys from a single pair, Mr. Gliddon thus sums up his final observations: "I propose, therefore, that a male and female pair of the 'species' *Cynocephalus Hamadryas*, be henceforward recognised as the anthropoid analogues of Noah, Shem, Ham, and Japhet; and that it must be from these two individuals that, owing to transplantation,

together with the combined action of aliment and climate, the fifty-four monkeys represented on our chart have originated. It is, notwithstanding, sufficiently strange, that, under such circumstances, this 'primordial organic type' of monkey should have so highly improved in Guinea, and in Malayana, as to become *gorillas* and *chimpanzees*, *orangs* and *gibbons*; whereas on the contrary, the descendants of 'Adam and Eve' have, in the same localities, actually deteriorated into the most degraded and abject forms of humanity." In reality, however, whatever may be said about the possibility of such simian development, possible human deterioration is an inevitable attribute of the rational, moral free-agent man: capable of the noblest aspirations and of wondrous intellectual advancement, but also with a capacity for moral degradation such as belongs to him alone. The one characteristic, no less than the other, separates man from all those other living creatures that might appear in some respects gifted with endowments akin to his own.

Man, as a tool-using artificer, seems to have a rival in the beaver, felling its timber, carrying its clay, and building its dam; in the spider weaving its web, more perfect than any net of human fisher; and even in the squirrel with its provident hoard of well-secured winter store, or the monkey employing the cocoa-nut and other shell-fruit as missiles. But in such artificial appliances there is nothing obsolete, nothing inventive, nothing progressive; whereas the child born amid the most highly developed civilisation,—the son of a Watt, a Stephenson, a Brunel,—if reared from infancy to manhood without any knowledge of mechanical science or the industrial arts, would start anew from the rudimentary instincts of the tool-using animal, and

expend his ingenuity, not perhaps without some traces of hereditary mechanical genius, on the primitive materials of flint, stone, horn, or shell.

Man depends for all on his teachers; and when moral and intellectual deterioration return him to the toolless condition of the uncivilised nomad, he is thrown back on the resources of his infantile reason and primary instincts, and reaches that point from which the primeval colonist has had to start anew in all lands, and work his way upwards, through stone, and bronze, and iron periods, into the full co-operation of a civilised community, treasuring the experience of the past, and making for itself a new and higher future.

The subdivisions of the archæologist designated THE STONE PERIOD, THE BRONZE PERIOD, and THE IRON PERIOD, have been brought into some discredit, in part by what, as a general system, must be regarded only as a hypothesis, being assumed as involving facts of no less indisputable and universal application than the periods of the geologist. In part, also, their non-acceptance is due to wilful errors of their impugners; and to the want of appreciation of the inevitable characteristics which pertain to transitional periods, such as chiefly come under the European archæologist's observation. So far as the American Indian is concerned, the New World is in the first transitional stage still: that of a stone-period, very partially affected by the introduction of foreign-wrought weapons and implements; and scarcely indicating, among the numerous tribes of North America, any traces of the adoption of a superinduced native metallurgy. Such therefore appears to be a condition of things, the comparison of which with traces of a corresponding stage in the early ages of Britain, may be of use in clearing the

subject from much confusion.

The special characteristics of the native civilisation which the early Spanish adventurers found already existing in Mexico and Central America, will come under review at a later stage; but it cannot admit of question that throughout the whole Red Indian forest-area metallurgic arts were unknown, as they still are among the Indians of the North-west after an intercourse of upwards of three centuries and a half with Europeans. Copper, indeed, was wrought among them, but it was used without any application of fire, and as what maybe most fitly designated a mere malleable stone. In Britain, as I have already observed, "the working of gold may have preceded the age of bronze, and in reality have belonged to the Stone Period. If metal could be found capable of being wrought and fashioned without smelting or moulding, its use was perfectly compatible with the simple arts of the Stone Period. Masses of native gold, such as have been often found both in the Old and the New World, are peculiarly susceptible of similar application by the workers in stone; and some of the examples of Scottish gold personal ornaments fully correspond with the probable results of such an anticipatory use of the metals."[68] The idea thus formed from an examination of some of the most artless examples of primeval British goldsmiths' work, has been amply confirmed by observing the mode of using the native copper, and the traces of its former working, among the American Indians. Even now their highest attainment in metallurgic skill extends only to grinding the iron hoops with which the Hudson's Bay fur-traders supply them, into knives, arrow-heads, and the like substitutes for the older implements chipped out of flint, or ground from the broken

stone. Further opportunities will occur for illustrating this subject; which is full of interest to the ethnologist, from the light it throws on the rate of progress of a barbarous people towards civilisation; or rather on the capacity of man in a certain undeveloped stage, for witnessing the most remarkable products of the useful arts, without evincing any desire to master them.

After centuries devoted to the elucidation of Roman remains, and the assignment to Roman artificers of much which more discriminating classification now awards to totally different workmen: the discovery of weapons and implements of stone, shell, or bone, in nearly every quarter of the globe, has at length excited a lively interest among the archæologists of Europe. Made, as these primitive relics are, of the most readily wrought materials, and by what may be styled the constructive instincts, rather than the acquired skill of their rude artificers, they belong to one condition of man, in relation to the progress of civilisation, though pertaining to many periods of the world's history, and to widely separated areas. In one respect, however, those relics possess a peculiar value to the ethnologist. The materials employed in their manufacture have within themselves, most frequently, the evidence of their geographical origin, and in some of them also of their era. The periods to which numerous European relics pertain may frequently be determined, like those of older strata, by the accompanying imbedded or buried fossils. The bones of the *Bos primigenius* have been found indented with the stone javelin of the aborigines of Northern Europe, and dug up even in places of regular British sepulture. Those of the *Megaceros Hibernicus* seem, in like manner, to be traced to a period of ancient Irish colonisation, when

flint-knives and stone hatchets prove the simple character of the native arts; though even then they furnished the material for constructing one of the earliest musical instruments. Yet other evidence shows that the same gigantic Irish deer was contemporary with the woolly rhinoceros, the mammoth, and the fossil carnivora of the caverns. The *Bos longifrons*, doubtless, traces its descent from an ancestry not less ancient; but from its wild herds the native Briton derived his domesticated cattle, and its most recent relics pertain to an era later than the Roman times. The ornamented tusks of the wild boar, the bones of the brown bear, the teeth and skulls of the beaver, carvings wrought from the walrus ivory, skates formed from the metatarsal and metacarpal bones of the red-deer and small native horse, with numerous kindred relics of palæontology within the era of the occupation of the British Islands by man, all serve to assign approximate dates to the examples of his ancient arts which they accompany.

Thus within the historic period, as in prior geological eras, the progress of time is recorded by the extinction of races. The advent of man was speedily marked by the disappearance of numerous groups of ancient life which pertain to that transitional era where archæology begins; though the most recent discoveries of works of art along with the fossil mammals of the drift, confirm, by new and striking evidence, the fact that man entered on this terrestrial stage, not as the highest in an entirely new order of creation, and belonging to an epoch detached by some overwhelming catastrophe from all preceding periods of organic life: but as the last and best of an order of animated beings whose line sweeps back into the shadows of an unmeasured past.

The disclosures of British tumuli, along with rarer chance deposits, show that the Celtic Briton was an intruder upon older allophylian occupants; while the presence of the Roman is recorded for us by the extinction of an ancient fauna, as well as of whole British tribes. What the Roman partially accomplished, the Saxon, the Dane, and the Norman completed: displacing the Briton everywhere but from the fastnesses of Wales; and gradually extirpating all but such animals as are either compatible with the development of social refinement, or are worthy of protection as a means of ministering to man's pleasures. And as it has been in the Old World, so it is in the New. The progress of the European colonists not only involves the extirpation alike of the wild animals and the forests which formed their haunts; but also the no less inevitable disappearance of the aborigines who made of them a prey. Thus the grave-mound of the Red Indian, and the relics of his simple arts, become the memorials of an extinct order of things no less clearly defined than the post-tertiary fossils of the drift.

But while the remains of extinct species thus serve to determine the periods at which certain eras had their close, the traces of living or extinct fauna are no less valuable as fixing the geographical origin of the ancient colonists, amid whose relics they are found: just as the elephants, the camels, the monkeys, and baboons of the Nimrod obelisk, or the corresponding sculptures on the walls of Memphis or Luxor, indicate the countries whence tribute was brought, or captives were carried off, to aggrandise their Assyrian or Egyptian conquerors. Among relics which help to fix the geographical centres of ancient arts, the sources of early commerce, or the

birthplaces of migrating races, might be noted the tin and amber of the Old, and the copper of the New World. So also the Mexican obsidian, the clay-slate of Columbia, the favourite red pipe-stone, or *Catlinite*, of the Couteau des prairies, and the pyrulæ and conch-shells of the Gulf of Florida, indicate varied sources of ancient trade or barter, and lines of migration extending over fully twenty degrees of latitude. Objects wrought in the favourite materials brought from such remote sources have been found mingling with relics of ancient tribes in the islands and on the north shores of the great Canadian lakes, along the southern slope of the same water-shed whence the Moose and the Abbitibbe pour their waters into the frozen sea of Hudson's Bay.

The designation of any primitive stage of industrial arts as a Stone Period signifies, as has been already sufficiently indicated, that condition in which, in the absence of metals, and the ignorance of the simplest rudiments of metallurgy, man has to find materials for the manufacture of his tools, and the supply of his mechanical requirements, in the commoner objects which nature places within his reach.

Nothing can well be conceived much more artless than some of the stone implements still in use among savage tribes of America. Yet it is worthy of note that it is not amid the privations of an Arctic winter, but in southern latitudes, with a climate which furnishes abundant resources for savage man, that the crudest efforts at tool-making are found. In the report of the United States Geological Survey for 1872, which embraces Montana, Idaho, Wyoming, and Utah, Professor Joseph Leidy furnishes an interesting account of numerous implements of art, rude as any found in the drift, met by him during a survey of the

Bridgers Basin at the base of the Unitah Mountains, in Southern Wyoming. “In some places the stone implements are so numerous, and at the same time are so rudely constructed, that one is constantly in doubt when to consider them as natural or accidental, and when to view them as artificial.”[69] But with them are mingled implements of the finest finish. The Shoshones who haunt the region have no further knowledge of them than is indicated in their belief that they were a gift of God to their ancestors. But many are sharp, and fresh in appearance, as if recently worked from the parent block; and though others are worn, and decomposed on the surface, Professor Leidy does not assume more than a date of “centuries back” for the oldest of them. For, indeed, he found that the Shoshone Indians had in use a stone implement of so simple a character that he says, “had I not observed it in actual use, and had noticed it among the materials of the buttes, or horizontal strata of indurated clays and sandstone, I would have viewed it as an accidental spawl. It consists of a thin segment of a quartzite boulder, made by striking the stone with a smart blow. It is called a *teshoa*, and is employed as a scraper in dressing buffalo skins.” Subsequently he discovered a precisely similar implement, together with some perforated tusks of the elk, in an ancient Indian grave.



FIG. 53.—Texas Stone Axe, hafted.

No such rude implements are found among the productions of the arctic tool-makers. The necessities of the Esquimaux, in their clothing and hunting,

beget systematic habits of industry and matured skill. The elaborate decorations of their skin and fur dresses, the carving of their ivory and bone implements, and the ingenuity lavished upon their children's toys, all prove how thoroughly the æsthetic, as well as the industrial arts, are developed by the stimulus which man's necessities create. In Fig. 53, an axe, or war-club, is shown, procured from the Indians of the Rio Frio, in Texas. The blade is a piece of trachyte, so rudely chipped that it could scarcely attract attention as having been subjected to any artificial working, but for the club-like haft into which it is inserted. I am indebted to Mr. Evans for the use of the woodcut. He describes the haft as formed of some indigenous wood, which has evidently been chopped into shape by means of stone tools. Nothing ruder has been brought to light among the earliest disclosures of drift or cave deposits. Another Texas implement in the Smithsonian collection at Washington is a roughly shaped flint blade, which, as shown of the full size in Fig. 54, closely resembles a familiar class of oval implements of the river-drift. It is curious, indeed, to note the undesigned correspondence between the implements of races equally widely separated by time and space. Several examples of stone celts or hatchets attached to their handles have been recovered in British and Irish bogs, and in the submerged lake-dwellings of Switzerland.



FIG. 54.—Texas Flint Implement. (1/1).

All alike show a wooden haft pierced so as to admit of the insertion of the stone blade, which must have been secured by a withe or thong tightly bound round it, according to a fashion still practised in America, and among the islands of the Pacific. But in spite of this ligature, the wedge-like form of the axe must have had a tendency to cleave the haft, and so to loosen its hold. The experience of the ancient Lake-dwellers led them to counteract this by inserting the stone blade in a socket of deer's-horn, the end of which is usually cut into a squared tenon designed to fit into a mortice in the handle. This must have accomplished the desired purpose, as examples of such deer's-horn sockets are common on the sites of lake-dwellings. During the last visit of Professor Agassiz to his native Swiss Canton, and the

village parsonage of Concise where his early years were passed, he obtained from Lake Neuchâtel a valuable collection of stone implements, along with pottery and other illustrations of the arts and habits of the Lake-dwellers, already referred to. Some of those are specially interesting as examples of the mode of hafting implements of flint and stone.

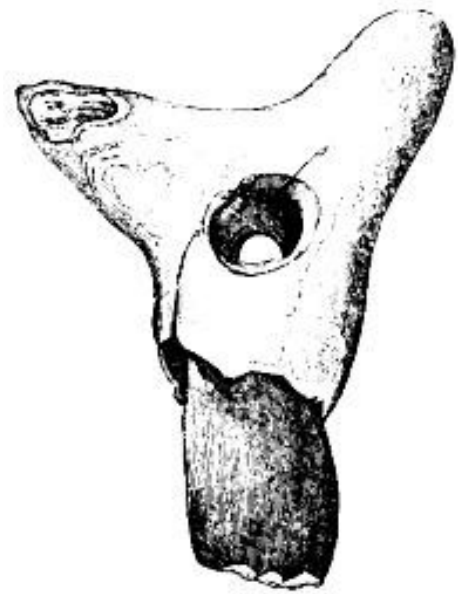


FIG. 55.—Chisel and deer's-horn socket, Concise.

Fig. 55 shows a perforated deer's-horn socket with a chisel of greenstone inserted in it. The exposed part of the blade measures nearly two inches in length. It must have been secured in its haft by a strong cement, such as some of the Pacific Islanders employ at the present day in fastening their axe-heads to bone and wooden handles. In some cases a tine of the deer's antler has been left so as to form the handle of the hammer or hatchet. A rare example of

this type is described by Dr. Clement, among numerous varieties recovered from different localities on Lake Neuchâtel. The horn of the stag was also at times converted into a formidable weapon by retaining the brow-antler as the offensive weapon, and detaching the rest, so as to leave only the main portion of the horn as a handle. Fig. 56, also from Lake Neuchâtel, may be described as a stone knife. The blade, which is of polished serpentine, measures 3½ inches in the exposed part, and is still secure in its horn haft. In the collection of Mr. J. H. Blake of Boston are flint implements recovered from an ancient Peruvian tomb on the Bay of Chacota, attached to their hafts by a tough green cement.



FIG. 56.—Stone Knife, Concise.

It is remarkable to notice how rarely the simple process of perforating the blade for the reception of the handle was resorted to, even where the workmen were in the habit of perforating both bone and stone implements for other purposes. This was no doubt partly due to the frangible character of much of the material in which they wrought; but even after the primitive metallurgist had mastered the art of alloying and casting his bronze, it seems to have been long before he learned to fit a handle to his axe or hammer by perforating the blade or hammer-head. Some of the most usual modes of attaching the axe or hatchet to a haft of wood or bone, in use among the islanders of the Pacific, are shown in a group of implements from the collection of the Scottish Antiquaries, Fig. 57. They bear a close resemblance to others described by Mr. William H. Dall as pertaining to the Thlinkets, a coast tribe of Alaska, not far to the south of Behring's Strait.[70] But tools and weapons of stone, as well as of native copper, are already becoming rare among the tribes of the North Pacific Coast, owing to the introduction of iron by the Russian and Hudson's Bay traders. Previous to this change, the Alaskans knew metal only in the form of cold-wrought native copper, as among all the native tribes north of the Mexican Gulf. Such a recognition of some convenient uses to which the malleable native metals could be applied as substitutes for stone, can scarcely be regarded as even an initial step in the transition towards the first true metallurgic period. This cannot be considered to have been introduced until the native copper-worker had perceived the wonderful transformations which could be wrought by fire, and had learned at least to melt the pure metal, and to mould the weapons and

implements he required; if not to harden it with alloys, and to quarry and smelt the unfamiliar ores. To this stage the savage tribes of the New World have not even now attained, after intercourse with Europeans for more than three centuries and a half. There, on the contrary, the Indians, who originally possessed only weapons, implements, and personal ornaments of bone, shell, flint, and stone, or at most of native copper rudely hammered into shape, are still seen after an interval of upwards of three centuries of European colonisation and traffic, without the slightest acquired knowledge of working in metals. They do, indeed, possess numerous metal implements and weapons, which, as their greatest treasures, they freely lavish on the loved or honoured dead; but such traces of metallurgy afford no proof of acquired native art. The copper kettles of the ancient Huron graves on the Georgian Bay, or the Chinook coffin-biers on the Columbia river, were brought, not from the copper regions of Lake Superior, but from France, London, or Liverpool, along with the beads, knives, hatchets, and other objects of barter, by means of which the fur-traders still carry on their traffic with the Indian hunter. At most this only proves that a race, still in its stone-period, and possessing no greater skill than is required to grind an iron hoop into lance or arrow-heads, has been brought into contact with a civilised people, familiar with metallurgy and many acquired arts, such as the musket and the rifle may most aptly symbolise.

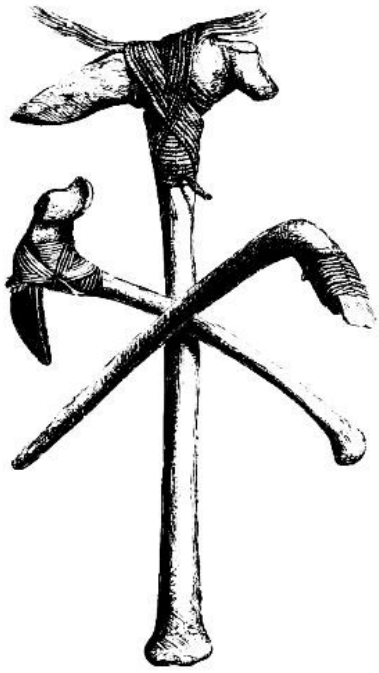


FIG. 57.—South Pacific Stone Implements.

The same diversity of inventive power and artistic skill is discernible among the Indians of North America as has been already referred to in comparing the arts of other uncivilised races. In some constructive skill predominates, while others manifest a peculiar aptitude for imitative art. The powers of imitation common to the barbarous and the civilised nations of the New World, are specially worthy of note; and will again come under review when referring to the pipe manufacture, so curiously typical of American art. But meanwhile an equally instructive illustration of what may thus be designated æsthetic and constructive instincts may be selected from the diversely gifted islanders of the Southern Pacific. On the extreme western verge of

the Polynesian archipelago lie the Fiji Islands, occupied by a people remarkable among the islanders of the Pacific alike for physical and intellectual peculiarities. The Fijian physiognomy is described as presenting general characteristics of debasement, when compared with that of the true Polynesian, and the entire proportions and contour of their figure are markedly inferior to those of the Friendly and Navigator islanders. This is the more remarkable in a people dwelling in the midst of abundance, and enjoying an unusual variety of choice articles of food. Their ferocious and treacherous habits, however, and the hideous customs of cannibalism and systematic parricide, with attendant crimes inevitable in such a social condition, have rendered the Fijian Islands, which seem fitted by nature to be abodes of happiness, among the most wretched scenes of moral degradation. Nevertheless it is in this strange island-group that the arts of the South Pacific have their highest development.

The Papuans, or Negrillos, appear to be the true inventive race, from whom the Fijians, who are unquestionably allied to them in blood, acquired, elaborated, and greatly improved many applications of art and skill. The Papuans of New Caledonia, though superior in physical characteristics to other islanders of the Negrillo type, present some curious analogies to the Australian, especially in their mode of sepulture. Fig. 58 is an example of their ingenuity in adapting a simple stone chisel to its haft, so as to serve as a boat-carpenter's adze. But the ingenious Negrillo is altogether unsocial and prone to isolation, and the Fijians manifest an equally strong disinclination to leave their island-home. It required, therefore, the intervention of a migratory or

aggressive race to diffuse their acquired knowledge and skill; and this is supplied by the Malayans, who are found in contact with many nations, and are of a roving disposition, the proper children of the sea. “Naturally,” says Dr. Pickering, “the most amiable of mankind, they are free from antipathies of race, are fond of novelty, inclined rather to follow than to lead, and in every respect seem qualified to become a medium of communication between the different branches of the human family.” Such an impressible race of mediators being found, a curious light is thrown on the diffusion of knowledge and the primitive arts throughout the widely-scattered island groups of the Southern Pacific, where almost every Polynesian art, it is said, can be distinctly traced to the Fiji Islands, while the Fijian himself is so averse to roam.



FIG.58.—Stone Adze, New Caledonia.

Mr. Wallace, in reviewing the races of the Malay archipelago, dwells on the marked differences, physically, intellectually, and morally, between the Papuan and the Malay. The central home of the Papuans is New Guinea and some of the adjacent islands; but the same ethnical characteristics are traceable over the islands to the east of New Guinea, as far as the Fijis. "The Papuan," Mr. Wallace remarks, "has a greater feeling for art than the Malay. He decorates his canoe, his house, and almost every domestic utensil, with elaborate carving; a habit which is rarely found among tribes of the Malay race." In the affections and moral sentiments, on the contrary, the Papuans compare unfavourably with the Malays, who are gentle and passive in all their social relations. But this is properly traced to their listless, apathetic character; while the vigour of the uncivilised Papuan manifests itself in the unrestrained display of every emotion and passion, even among the women and children, and in violent collisions, inevitable in the social life of this savage race. Among such a people the best and the worst characteristics are often strangely intermingled. The Fiji Islanders use the bow and throw the javelin with great dexterity; but their peculiar and distinguishing weapon is a short missile club, which all habitually wear stuck in the belt, the symbolic national

instrument of assassination. Many analogies of history tend, however, to refute the error of assuming the occurrence of moral degradation, even when manifested in parricide, cannibalism, and systematic treachery and assassination, to be necessarily incompatible with such intellectual development as distinguishes the Fijians from the Malays or other islanders of the Pacific. Of all the aborigines of the Pacific, the ferocious New Zealander has proved most capable of civilisation; and is found moreover to possess a traditional poetry and mythical legends of a highly striking and peculiar character. And turning from still undeveloped races of the world, we have only to study deeds perpetrated by the pagan Saxon, the Hun, or the later Dane and Norseman, to see in what hideous aspects the energies of a rude people may be manifested, who are nevertheless capable of becoming leaders in the civilisation of Europe. To judge by the monkish chronicles, no Fiji cannibal could surpass, either in savage atrocity or in hideousness of aspect, the Hungarian or Northman from whom the proudest of Europe's nobles claim descent. The chroniclers of Germany, France, and Italy, dwell on the savage fury of the Huns; and the liturgy of the Gallican Church of the ninth century preserves the memorial of the pagan Northmen's ravages, in the supplication added to its litany: *A furore Normannorum libera nos*.

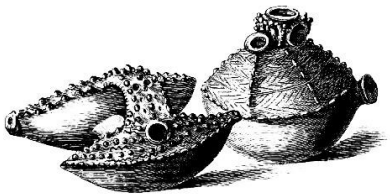


FIG. 59.—Fijian Pottery.

It is obvious therefore that the savage vices of the Fijians are perfectly compatible with considerable skill in such arts as pertain to their primitive and insular condition. Their musical instruments are superior to those of the Polynesians, and include the Pan-pipe and others unknown in the islands beyond their range. Their pottery also exhibits great variety of form, and includes examples of vessels combined in groups, presenting a curious correspondence to similar productions of Peruvian art. Their fishing-nets and lines are remarkable for neat and skilful workmanship, and they carry cultivation to a considerable extent. "Indeed," remarks the ethnologist of the United States Expedition, in summing up the characteristics of the Fijians, "we soon began to perceive that the people were in possession of almost every art known to the Polynesians, and of many others besides. The highly-finished workmanship was unexpected, everything being executed until recently, and even now for the most part, without the use of iron. In the collection of implements and manufactures brought home by the Expedition, the observer will distinguish in the Fijian division something like a school of arts for the other Pacific islands." Fig. 59 shows two characteristic specimens of their pottery selected from the Smithsonian collections at Washington. They are extremely well burnt, and finished with a bright glaze. One of them illustrates a class of double vessels suggestive of certain analogies with a familiar style of Peruvian pottery; and the prevailing characteristics of the whole collection confirm the superiority ascribed to the Fijian artificer. In such a strangely-gifted savage race we see the degradation of which human nature is susceptible; and at the same time recognise germs of a constructive and

artistic capacity capable of development into many marvellous manifestations, if once subjected to such influences as those which changed the merciless pirate of the northern seas into the refined Norman, the chivalrous crusader, and the imaginative troubadour.

The native races of America are neither devoid of energy nor ingenious artistic skill; and the progress attained by the Mexicans and Peruvians, as well as by the nations of Central America, proved their capacity for advancement in the arts of civilisation. But the fate which has everywhere befallen the Red Indians when brought into direct contact with European settlers, shows how impossible it is to abruptly bridge over the gulf which separates the infancy of nations from a maturity like that to which the rude Saxon and Northman attained through the schooling of many centuries. The Aztecs at the time of the Mexican conquest were probably not ruder than the first Angle and Saxon colonists. They were certainly no crueler than the Northmen of the eighth century. But they were far in advance of the northern tribes from which, according to Aztec traditions, they traced their descent.

Among the barbarous races of the northern continent, the tribes of the Iroquois confederacy, though scarcely rising above the hunter stage, offer a subject of study of peculiar value in reference to the ethnology of the New World. In the great valley of the St. Lawrence, at the period of earliest European contact with its native tribes, we find this confederacy of Indian nations in the most primitive condition as to all knowledge of progressive arts; but full of energy, delighting in military enterprise, and amply endued with the qualities requisite for effecting permanent conquests over a civilised but

unwarlike people. Nor did the primitive arts of the Iroquois prevent the development of incipient germs of civilisation among them. Agriculture was systematically practised; and their famous league, wisely established, and maintained unbroken through very diversified periods of their history, exhibits a people advancing in many ways towards the initiation of a self-originated civilisation, when the intrusion of Europeans abruptly arrested its progress, and brought them in contact with elements of foreign progress pregnant for them only with sources of degradation and final destruction.

The historian of the Iroquois,[71] when describing their simple arts and manufactures, remarks, that in the western mounds rows of arrow-heads or flint-blades have been found lying side by side, like teeth, the row being about two feet long. “This has suggested the idea that they were set in a frame, and fastened with thongs, thus making a species of sword.”[72] In this description we cannot fail to recognise the *mahguahuitl*, or native sword of Mexico and Yucatan. In the large canoe with its armed crew, first met off the latter coast, Herrera tells us the Indians had “swords made of wood, having a gutter in the forepart, in which were sharp-edged flints strongly fixed with a sort of bitumen and thread.” Among the Mexicans this toothed blade was armed with the *itzli*, or obsidian, capable of taking an edge like a razor; and the destructive powers of this formidable weapon are frequently dwelt upon by the early Spaniards. Among the ruins of Kabah, in Yucatan, the attention of Stephens was attracted by the protruding corner of a huge sculptured slab, the basso-relievos on which consist of an upright figure having a lofty plume of feathers falling to his heels; while another figure kneels before him holding in his

hands the very same weapon, with its flint or obsidian blades projecting from the wooden socket. The idea it suggests is not necessarily that assumed by Stephens: that the sculptors and architects of the great ruins of Central America and Yucatan were the same people whom the Spaniards found there on their landing. The sculpture may be of a greatly older date. On its lower compartment is a row of hieroglyphics; and the suppliant attitude of the armed figure is rather suggestive of a record of conquest over some barbarian chief of Mexican or more northern tribes, of whom the flint-edged sword-blade was the most typical characteristic. Nevertheless, there is a singular interest in the simple chain of evidence, thus confirmatory of the Aztec traditions of original migration, and the subjugation of the elder civilised race of Anahuac by northern warriors: which leads us, step by step, from such rude arts as those of the Iroquois, and relics of other barbarous tribes in western sepulchral mounds, to the Mexican armature of the era of the conquest, and artistic records of the lettered architects of Yucatan.

The history of the Iroquois and their simple arts, illustrates with peculiar aptness the unwritten chronicles of the New World. In their rude state they achieved a remarkable civil and military organisation, and acquired more extensive and enduring influence than any nation of native American lineage, excepting the civilised Mexicans and Peruvians. Their own traditions pointed to an era when they migrated from the northern shores of the St. Lawrence into that region to the south and east of Lake Ontario, where they dwelt through all the period of their authentic history; though two members of the league, the Senecas and Onondagas, claimed to be autochthones, sprung from the soil of

that Iroquois territory. The league embraced the Oneidas, Onondagas, Cayugas, Senecas, and Mohawks, all united in a strictly federal union; and to this the Tuscaroras were admitted, on their expulsion from North Carolina in 1715. The claim of a common origin advanced by a people occupying territory so far to the south, throws an interesting light on the migrations of Indian tribes. It is confirmed by the character of their language, and received practical recognition in the assignment of a portion of the Oneida territory for their occupation. In the seventeenth century the Iroquois were the great aggressive nationality of the continent to the north of Mexico. In the very beginning of that century, Captain John Smith, the founder of Virginia, encountered their canoes on the upper part of the Chesapeake Bay, bearing a band of them to the territories of the Powhattan confederacy. The Shawnees, Susquehannocks, Nanticokes, Miamis, Delawares, and Minsi, were, one after another, reduced by them to the condition of dependent tribes. Even the Canarse or Long-Island Indians found no protection from them in their sea-girt home beyond the Hudson; and their power was felt from the St. Lawrence to Tennessee, and from the Atlantic to the Mississippi.

How long before the discovery of this vast region by Europeans, it had been in occupation by those who claimed to be its autochthones, we have no other knowledge than their own traditions of migration. But so far as arts are any evidence of national progress, they were then in their infancy. The region they occupied offered no advantages for the inauguration of a copper or bronze era, such as those of Lake Superior or the Southern Andes supplied to their ancient possessors. Of working in

metals they knew nothing; and only supplemented their primitive implements, wrought in stone, flint, horn, bone, and wood, by barter with the European intruders. Nevertheless, for nearly two centuries, the Indians of the Five Nations, as they were called before the addition of the Tuscaroras, presented a sturdy and unbroken front to the encroachments alike of Dutch, French, and British colonists. But their hostility was concentrated in opposition to the French nation; and as the rival colonies of France and England were long nearly balanced, it is not unjustly affirmed by the historian of the Iroquois, that France owed the final overthrow of her magnificent schemes of colonisation in North America to their uncompromising antagonism.

Among the Mexicans the arts of a true stone-period had been carried to the highest perfection, along with a development of those of their bronze age. On the northern frontier of Mexico, towards the head-waters of the Great Barauca, is the Cerro de Navajas, the "Hill of Knives," where, before the conquest, obsidian was mined for manufacturing purposes: like the chert and hornstone of the Flint Ridge pits of Kentucky and Ohio. Examples of elaborately-worked obsidian and flint, and of polished implements and ornaments of stone, executed by Mexican artificers, rival the finest specimens recovered among the relics of Europe's neolithic period. The Christy collection is specially rich in objects of this class. One flame-shaped arrow-head chipped with the nicest art, is evidently executed as a display of lapidary skill. Another fine spear-blade, made of a semi-opalescent chalcedony which occurs as concretions in the trachytic lavas of Mexico, measures eight inches long, and is supposed to have served as a state halberd, as it is much too

delicate for actual warfare. But it is obvious that a finer material than usual frequently tempted the worker in flint or obsidian to an unwonted display of his art. In various private collections in Kentucky, Ohio, and Pennsylvania, I have seen choice specimens of spear and arrow-heads, and other objects, made of jasper, milky-quartz, and rock crystal; some of them wrought into fantastic or purely ornamental forms.

A state battle-axe in the Christy collection made of green quartzose avanturine, measures 11 inches in length. It is a thick wedge, with the upper part carved as the head of a Mexican idol or king, and the arms outlined on the blade. Jade, green serpentine, grey granite, agate, and obsidian of different colours, were all worked into various shapes for ornament or use, with a care often prompted by the attractive character of the material, and with a skill no longer known to the native Mexican artificers.



FIG. 60.—Honduras serrated Implement.

In the southern continent also examples of mastery in the manufacture of flint and stone implements survive, in some cases as the sole memorials of races which have perished; and traces of the arts of savage tribes in the primitive condition of a purely stone-period lie everywhere outside of the remarkable centres of Peruvian civilisation. Three such relics from the Bay of Honduras are deserving of special notice, from their unusually large size and peculiar forms. They were found, along with other implements, about the year 1794, in a cave between two and three miles inland. One of

them is now preserved in the British Museum, and the others have been repeatedly exhibited at meetings of the Archæological Institute. The accompanying illustrations will best convey an idea of their peculiar forms. One (Fig. 60) is a serrated weapon, pointed at both ends, and measuring sixteen and a half inches long. Another (Fig. 61), in the form of a crescent, with projecting points, measuring 17 inches in greatest length, may have served as a weapon of parade, like the state partisan or halberd of later times. The third, which is imperfect, is shown in Fig. 62. The whole are examples of flint implements of unusually large proportions, and chipped with extraordinary regularity and skill. A well-executed head of a warrior, in terra-cotta, obtained about the same period, if not indeed along with these implements, was presented to the Society of Antiquaries of Scotland in 1798, and is figured on a subsequent page. The unwonted size of those Honduras implements attracted special notice when first produced; but this ceases to excite surprise when it is seen that blocks of flint or hornstone adequate for the largest of them are readily procurable throughout extensive regions of North America, as in Ohio and Kentucky. To the north of Ohio, where the material is rare, flint implements and weapons are mostly of small size. The larger implements are of stone; and among the Iroquois, the Hurons, the Chippewas, and other tribes on the shores of the great lakes, the copper of Lake Superior seems to have been recognised, and sought for, as a fitter material for large hatchets and spear-heads.

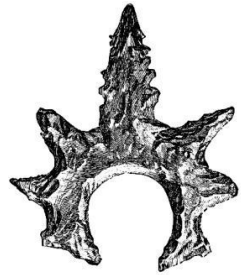


FIG. 61.—Honduras State Halberd.



FIG. 62.—Honduras Implement.

In this respect we see the very privations of those Indian tribes forcing on their notice the resources of the copper region, which might, among so energetic a people as the Iroquois proved themselves to be, have at length led to such a mastery of the metallurgic arts as was achieved by the nations of Mexico and Peru. But their energies were diverted into far different channels by the very advent of races already familiar with all the highest acquirements of civilisation; and whatever time might have developed out of the Iroquois confederacy, akin to the native civilisation which had already taken root beyond the verge of their southern conquests, they had little to hope from the triumph of either of the European aggressors between whom they so long held the balance. In the rivalry of the French and English colonists the insular race proved the victors; and when at a later date England and her American colonies came into collision, the nations of the League took different sides, and the Hodenosaunee[73] finally ceased to be

the ideal rallying-point of a united people. They had run their destined course; and now the poor scattered remnants of the once-famous Indian federation serve only to illustrate how irreconcilable are the elements of high civilisation with the most vigorous and progressive energy of a people only maturing the first stage in the progress of nations. They lacked the qualities which protect an inferior race from extinction when brought into contact with a long matured civilisation. Passive and naturally submissive races, like the Malay or the Negro, survive the intrusion of a dominant race, and are protected by their docility, as the natural serfs of the intruders. But an energetic people, who find their chief employment in war and the chase, can be subjected to no useful servitude. They are separated by too wide a gulf from their rivals to claim any equality in the rights of civilisation. The only alternative left for them is to drive out the intruder, or to be exterminated by him like the bear and wolf. Stone, Bronze, and Iron Periods are not indispensable steps in the advancement of the human race; but all experience proves that when such extreme social conditions are abruptly brought into contact as stone and iron periods aptly symbolise, the tendency is towards the degradation and final extinction of the less advanced race.

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[68] *Prehistoric Annals of Scotland*, 2d Ed. vol. i. p. 331.

[69] *U. S. Geological Survey*, 1872, p. 652.

[70] *Alaska and its Resources*, p. 418.

[71] Lewis H. Morgan: *League of the Ho-dé-no-sau-nee, or Iroquois*.

[72] See footnote 71.

[73] *Ho-dé-no-sau-nee*, or People of the Long House, expressive of the numerous assembly in the Council of the Confederacy.

CHAPTER VIII.

THE METALS.

DAWN OF A METALLURGIC ERA—PRIMITIVE COPPER-WORKING—COPPER REGION OF LAKE SUPERIOR—THE PICTURED ROCKS—JACKSON IRON MOUNTAIN—THE CLIFF MINE—COPPER TOOLS—ANCIENT MINING TRENCHES—GREAT EXTENT OF WORKS—MINES OF ISLE ROYALE—THEIR ESTIMATED AGE—ANCIENT MINING IMPLEMENTS—STONE MAULS AND AXES—ONTONAGON MINING RELICS—SITES OF COPPER MANUFACTORIES—NATIVE COPPER AND SILVER—BROCKVILLE COPPER IMPLEMENTS—LOST METALLURGIC ARTS—CHEMICAL ANALYSES—NATIVE TERRA-COTTAS—ANCIENT BRITISH MINING-TOOLS—THE RACE OF THE COPPER MINES—CHIPPEWA SUPERSTITIONS—EARLIEST NOTICES OF THE COPPER REGION—ONTONAGON MASS OF COPPER—ANCIENT NATIVE TRAFFIC—NATIVE USE OF METALS—CONDITION OF THE MOUND-BUILDERS—MINERAL RESOURCES—ANTIQUITY OF COPPER WORKINGS—DESERTION OF THE MINES.

The same rational instinct which prompted man in his first efforts at tool-making, guided him in a discriminating choice of materials; and to this the discovery of metals, and the consequent first steps in metallurgy and the arts, may be traced. The Bronze Age of Europe derives its name from the

predominance of relics illustrative of a period which, though old compared with that of definite history, belongs to a comparatively late era, characterised by many traces of artistic skill, and of mastery in the difficult processes of smelting ores and alloying metals. But the dawn of the metallurgic era in the New World is marked by phases which derive their distinctive character from two widely separated regions; and of which one supplies an important link in the history of human progress, at best but partially indicated in the disclosures of European archæology.

To untutored man, provided only with implements of stone, the facilities presented by the great copper regions of Lake Superior for the first step in the knowledge of metallurgy were peculiarly available. The forests that flung their shadows along the shores of that great lake were the haunts of the deer, the beaver, the bear, and other favourite objects of the chase; the rivers and the lake abounded with fish; and the rude hunter had to manufacture weapons and implements out of such materials as nature placed within his reach. The water-worn stone from the beach, patiently ground to an edge, made his axe and tomahawk: by means of which, with the help of fire, he could level the giants of the forest, or detach from them the materials for his canoe and paddle, his lance, club, or bow and arrows. The bones of the deer pointed his spear, or were wrought into his fish-hooks; and the shale or flint was chipped and ground into his arrow-head, after a pattern repeated with little variation, in all countries, and in every primitive age. But besides such materials of universal occurrence, the primeval occupant of the shores of Lake Superior found there a *stone* possessed of some very peculiar virtues. It could not only be wrought to an edge without

liability to fracture; but it was malleable, and could be hammered out into many new and convenient shapes. This was the copper, found in connection with the trappean rocks of that region, in inexhaustible quantities, in a pure metallic state. In other rich mineral regions, as in those of Cornwall and Devon, the principal source of this metal is from ores, which require both labour and skill to fit them for economic purposes. But in the veins of the copper region of Lake Superior the native metal occurs in enormous masses, weighing hundreds of tons; and loose blocks of various sizes have been found on the lake shore, or lying detached on the surface, in sufficient quantities to supply all the wants of the nomad hunter. These, accordingly, he wrought into chisels and axes, armlets, and personal ornaments of various kinds, without the use of the crucible; and, indeed, without recognising any precise distinction between the copper which he mechanically separated from the mass, and the unmalleable stone or flint out of which he had been accustomed to fashion his spear and arrow-heads. This is confirmed by philological evidence. The root of the names for iron and copper in the Chippewa is the same abstract term, *wahbik*, used only in compound words. Thus *pewahbik*, iron; *ozahwahbik*, copper: lit. the yellow stone; *metahbik*, on the bare rock; *oogedahbik*, on the top of a rock; *kishkahbikah*, it is a precipice; etc.

The earliest references to Britain pertain exclusively to the peninsula of Cornwall and the neighbouring islands, whither the fleets of the Mediterranean were attracted in ages of vague antiquity, and the traders from Gaul resorted in quest of its metallic wealth. The mineral regions of the New World disclose some corresponding records of its long-forgotten past; and some idea of their present

condition is indispensable for preparing the mind to appreciate the changes wrought by time on localities which are now being rescued once more from the wilderness. The vast inland sea, which constitutes the reservoir of the chain of lakes whose waters sweep over the Falls of Niagara, and find their way by the St. Lawrence to the ocean, has been as yet so partially encroached upon by the pioneers of modern civilisation, that the general aspect of its shores differs but little from that which they presented to the eye of its first European explorers in the seventeenth century: or indeed to its Indian voyagers before the Spaniard first coasted the island shores of the Bahamas, and opened for Europe the gates of the West. With its wide extent of waters, covering an area of thirty-two thousand square miles, a lengthened period of sojourn in the regions with which it is surrounded, and many facilities for their exploration, would be required, in order to satisfy the curiosity of the scientific inquirer. But even a brief visit discloses much that is interesting, and that serves at once to illustrate, and to contrast with what comes under the observer's notice elsewhere.

In tracing out the evidence of ancient occupation of the shores of Lake Superior, I have, on repeated visits, coasted its shores for hundreds of miles in canoes; and camped for weeks in some of its least accessible wilds. The force of the evidence is slowly appreciated, even by careful personal observation; but some description of the ancient copper region may help the reader to estimate the lapse of time since its forest-glades and rocky promontories were enlivened by the presence of industrious miners. The memorials of Time's unceasing operations reach indeed to periods long prior to the earliest presence of man, and present certain lake phenomena, on a

scale only conceivable by those who have sailed on the bosom of these fresh-water seas with as boundless a horizon as in mid-Atlantic; and who have experienced the violence of the sudden storms to which they are liable. But while the same broad ocean-like expanse, and the violence of their stormy moods, characterise Ontario, Erie, Huron, and Michigan: it is only on Lake Superior that the traveller witnesses the grandeur and wild ruggedness of scenery commensurate with his preconceived ideas of such inland seas. Along its northern and western shores bold cliffs and rocky headlands frown in savage grandeur, from amid the unbroken wastes of forest that reach to the frozen regions around the Hudson Bay, while the gentler coast-lines of its southern shores are varied by some of the most singular conformations, wrought out of its rocky walls by the action of the waves. Among such rock-formations, no features are so remarkable as those presented by a portion of the extensive range of sandstone cliffs, which project in jagged and picturesque masses from the southern shore, soon after passing the Grand Sable; and to which fresh interest has been given by the interweaving of the Algonquin legends of the locality into Longfellow's Indian *Song of Hiawatha*.

The Pictured Rocks are situated between the copper regions and the ancient portage, which has been recently superseded by a canal opening navigation for the largest vessels from Lake Huron to Lake Superior. They lie in the centre of the long indentation, which, sweeping from Keweenaw Peninsula eastward to White Fish Point, forms the coast most distant from the northern shores of the lake. Here the cliffs have been exposed through unnumbered ages to the waves under the action of

northerly winds; while a contemporaneous upheaval, prolonged probably through vast periods of time, has contributed no unimportant share in the operations by which their striking forms have been produced. Beyond those the voyager comes once more on rocky cliffs in the vicinity of Marquette: so named after the Jesuit missionary by whom the upper waters of the Mississippi were first reached two centuries ago, in 1673. Important changes have been wrought in the interval. Mineral treasures, undreamt of by the ancient miners, are now rewarding the industry of the Indians' supplanters. The iron period, with its fully developed civilisation, is invading those forest tracks; and when I first visited Marquette in 1855, on the bold trappean rocks which form the landing, abraded and scratched with the glacial action of a long superseded era, were piled the rich products of the "Jackson Iron Mountain," which rears its bold outline at a distance of twelve miles from the shore. Immediately to the north of this point the promontory of Presque Isle presents in some respects a striking contrast to the Pictured Rocks; though, like them, also indented and hollowed out into detached masses, and pierced with the wave-worn caverns of older levels of shore and lake. Here the water-worn sandstone and the igneous rocks overlie or intermingle with each other in picturesque confusion: the symbol, as it were, of the transition between the copper and iron eras. For it is just at Presque Isle that the crystalline schists, with their intermingling masses of trappean and quartz rocks, richly impregnated with the specular and magnetic oxide of iron, pass into the granite and sandstone rocks, which intervene between the ferriferous formations and the copper-bearing traps of Keweenaw Point. Beyond this, the rich copper-

bearing region of the Keweenaw Peninsula stretches far into the lake, traversed in a south-westerly direction by magnificent cliffs of trappean rocks, presenting their perpendicular sides to the south-east, and covered even amid the rocky débris with ancient forest-trees. In this igneous rock are found the copper veins, which in recent years have conferred such great commercial value on the district of Michigan; and there I not only witnessed extensive mining operations in progress, but have investigated evidences of the ancient miners' labours which prove the prolonged practice there, at some remote period, of native metallurgic arts.

On landing at Eagle river, one of the points for shipping the copper ores, on the west side of the Keweenaw Peninsula, the track lies through dense forest, over a road in some parts of rough corduroy, and in others traversing the irregular exposed surface of the copper-bearing trap. After a time it winds through a gorge, covered with immense masses of trap and crumbling débris, amid which pine, and the black oak and other hard wood, have contrived to find a sufficient soil for taking root and attaining their full proportions; and beyond the cliffs, in a level bottom on the other side of the trap ridge, is the Cliff Mine settlement, one of the most important of all the mining works in operation in this region. Here I descended a perpendicular shaft by means of ladders, to a depth of sixty fathoms, and explored various of the levels: passing in some cases literally through tunnels made in the solid copper. The very abundance of the metal proves indeed, at times, an impediment to its profitable working, owing to the labour necessarily expended in chiselling out masses from the solid lump, to admit of their being taken to the surface, and transported through such tracts as

have been described, to the Lake shore. The floor of the level was strewed with copper shavings: for the extreme ductility of the native copper precludes the application of other force than manual labour for separating it from the parent mass. I saw also beautiful specimens of silver, in a matrix of crystalline quartz, obtained from this mine; and the copper of the district is stated to contain on an average about 3·10 per cent. of silver. This is indeed by far the richest mineral locality that has yet been wrought. In a single year upwards of sixteen hundred tons of copper have been procured from the Cliff Mine, and one mass was estimated to weigh eighty tons. Its mineral wealth was known to the ancient miners; but the skill and appliances of the modern miner give him access to veins entirely beyond the reach of the primitive metallurgist, who knew of no harder material for his tools than the native rock and the ductile metal he was in search of.

At the Cliff Mine are preserved some curious specimens of ancient copper tools found in its vicinity, but it is to the westward of the Keweenaw Peninsula that the most extensive traces of the aboriginal miners' operations are seen. The copper-bearing trap, after crossing the Keweenaw Lake, is traced onward in a south-westerly direction till it crosses the Ontonagon river about twelve miles from its mouth, at an elevation of upwards of three hundred feet above the lake. At this locality the edges of the copper veins crop out in various places, exposing the metal in irregular patches over a considerable extent of country, many of which have been partially wrought by the ancient miners. Here, in the neighbourhood of the Minnesota Mine, are extensive traces of trenches and other mining operations, which prove that they must have been

carried on for a long period. These excavations are partially filled up, and so overgrown in the long interval between their first excavation and their observation by recent explorers, that they scarcely attract attention. Nevertheless some trenches have been found to measure from eighteen to thirty feet in depth; and one of them disclosed a detached mass of native copper, weighing upwards of six tons, resting on an artificial cradle of black oak, partially preserved by immersion in the water with which it had been filled. Various implements and tools of the same metal also lay in the deserted trench, where this huge mass had been separated from its matrix, and elevated on the oaken frame, preparatory to its removal entire. It appeared to have been raised about five feet, and then abandoned, abruptly as it would seem: since even the copper tools were found among the accumulated soil by which it had been anew covered up. The solid mass measured ten feet long, three feet wide, and nearly two feet thick; every projecting piece had been removed, so that the exposed surface was left perfectly smooth, possibly by other and ruder workers of a date subsequent to the desertion of the mining trench by its original explorers.

The mining operations of upwards of a quarter of a century have done much to efface the traces of the ancient works, as every indication of them is eagerly followed up by the modern miner, as the most promising clew to rich metalliferous deposits. But towards the close of 1874 Mr. Davis, an experienced old miner of Lake Superior, recovered from another ancient trench, in the same region, a solid mass of nearly pure copper, heart-shaped, and weighing between two and three tons. It lay at a depth of seventeen feet from the surface, as when originally

detached from its bed by the ancient miners. Alongside of it were a number of smaller pieces, from a single ounce to seventeen pounds in weight, evidently broken off the large mass by the original workers of the mine. Numerous stone mauls and hammers also, weighing from ten to thirty pounds, lay scattered through the lower débris with which the trench was refilled. But the absence of any copper tools seemed to point to the final desertion of the mine, from some unknown cause, at the very time when its resources were most available.

Attention was first directed to such traces of ancient mining operations, by the agent of the Minnesota Mining Company in 1847. Following up the indications of a continuous depression in the soil, he came at length to a cavern where he found several porcupines had fixed their quarters for hybernation; but detecting evidences of artificial excavation, he proceeded to clear out the accumulated soil, and not only exposed to view a vein of copper, but found in the rubbish numerous stone mauls and hammers of the ancient workmen. Subsequent observation brought to light excavations of great extent, frequently from twenty-five to thirty feet deep, and scattered over an area of several miles. The rubbish taken from these is piled up in mounds alongside; while the trenches have been gradually refilled with soil and decaying vegetable matter gathered through the long centuries since their desertion; and over all, the giants of the forest have grown, withered, and fallen to decay. Mr. Knapp, the agent of the Minnesota Company, counted 395 annular rings on a hemlock-tree, which grew on one of the mounds of earth thrown out of an ancient mine. Mr. Foster also notes the great size and age of a pine-stump which must have grown and died since the works were

deserted; and Mr. Whittlesey not only refers to living trees upwards of three hundred years old, now flourishing in the abandoned trenches; but he adds: “on the same spot there are the decayed trunks of a preceding generation or generations of trees that have arrived at maturity and fallen down from old age.” The deserted mines are found at numerous points extending over upwards of a hundred miles along the southern shore of the lake; and reappear beyond it, in extensive excavations on Isle Royale. Sir William Logan reports others observed by him on the summit of a ridge at Maimanse, on the north shore, where the old excavations are surrounded by broken pieces of vein-stone, with stone mauls rudely formed from natural boulders. The extensive area over which such works have thus been traced, the evidences of their prolonged working, and of their still longer abandonment, all combine to force upon the mind convictions of their remote antiquity.

At Ontonagon river I met with Captain Peck, a settler whose long residence in the country has afforded him many opportunities of noting the evidences of its ancient occupation. Repeated discoveries had led him to infer the great antiquity of the works; and he specially referred to one disclosure of ancient mining operations near the forks of the Ontonagon river, where, at a depth of upwards of twenty-five feet, stone mauls and other tools were found in contact with a copper vein; in the soil above these lay the trunk of a large cedar, and over all grew a hemlock-tree, with its roots spread entirely above the fallen cedar, in the accumulated soil with which the trench was filled, and indicating a growth of not less than three centuries. But the buried cedar, which in favourable circumstances is far more durable than the oak, represents another and longer

succession of centuries, subsequent to that protracted period during which the deserted trench was slowly filled up with accumulations of many winters. In another excavation a bed of clay had been formed above the ancient flooring to the depth of a foot. On this lay the skeleton of a deer which had stumbled in and perished there; and over it clay, leaves, sand, and gravel had accumulated to a depth of nineteen feet. Not only are such indications frequent throughout the Keweenaw Peninsula, and to the westward and southward of Ontonagon; but on Isle Royale the abandoned mines disclose still stronger evidence of their great antiquity. The United States Geologists remark: “Mr. E. G. Shaw pointed out to us similar evidences of mining on Isle Royale, which can be traced lengthways for the distance of a mile. On opening one of these pits, which had become filled up, he found the mine had been worked through the solid rock, to the depth of nine feet, the walls being perfectly smooth. At the bottom he found a vein of native copper eighteen inches thick, including a sheet of pure copper lying against the foot-wall.” Stone hammers and wedges lay in great abundance at the bottom of the trenches, but no metallic implements were found: a proof perhaps that the mines of Isle Royale continued to be wrought after their workers had been hastily compelled to abandon those on the mainland. Mr. Shaw adopted the conclusion, from the appearance of the wall-rocks, the multitude of stone implements, and the material removed, that the labour of excavating the rock must have been performed solely with such instruments, with the aid, perhaps, of fire. But the appearance of the vein, and the extent of the workings, furnished evidence not only of great and protracted labour, but also of the use of other tools

than those of stone. Accumulated vegetable matter had refilled the excavations to a level with the surrounding surface, and over this the forest extended with the same luxuriance as on the natural soil. In this barren and rocky region the filling up of the trenches with vegetable soil must have been the work of many centuries; so that the whole aspect of the deserted mines of Isle Royale confirms the antiquity ascribed to them.

What appear to the eye of the traveller as the giants of the primeval forest, are the growth of comparatively modern centuries, subsequent to the era when the shores of Lake Superior rang with the echoes of industrial toil. Two or three centuries would seem altogether inadequate to furnish the requisite time for the most partial accumulation of soil and decayed vegetable matter with which the old miners' trenches have been filled. Four centuries thereafter are indisputably recorded by recent survivors of the forest, independent of all traces of previous arborescent generations; and thus in the excavations and tools of the copper regions of Lake Superior, we look on memorials of a metallurgic industry long prior to those closing years of the fifteenth century, in which the mineral wealth of the New World awoke the Spanish lust for gold. An uncertain, yet considerable interval must be assumed between the abandonment of those ancient works, and the forest's earliest growth; and thus we are thrown back, at latest, into centuries corresponding to Europe's mediæval era for a period to which to assign those singularly interesting traces of a lost American civilisation.

Owing to the filling up of the abandoned mining trenches with water, not only the copper and stone implements of the miners are found, but examples of

wooden tools and timber framing have also been preserved, in several cases in wonderful perfection; and these furnish interesting supplementary evidence of the character of their industrial arts.



FIG. 63.—Miners' Shovels.

Of the wooden implements, the most noticeable are the shovels, by means of which the soil was excavated. The accompanying woodcut represents two of them worn away to the one side, as in most of the examples found, as if used for scraping rather than digging the soil. Mr. Whittlesey gives a drawing of one which measured three and a half feet long, recovered among the loose materials thrown out from an extensive rock excavation in the side of a hill about four miles south-east of Eagle Harbour. Part of a wooden bowl used for baling water, and troughs of cedar-bark, were also found in the same débris, above which grew a birch about two feet in diameter, with its lower roots scarcely reaching through the ancient rubbish to the depth at which those relics lay. Mr. Foster describes another wooden bowl found at a depth of ten feet, in clearing out some ancient workings opened by the agent of the Forest Mine; and which, from the splintered pieces of rock and gravel imbedded in its rim, must have been employed in baling water. Similar implements have been met with in other workings, but they speedily perish on being exposed to the air. All of them appear to have been made of white cedar. The indestructible nature of this wood, when kept under water, or in a moist soil, is abundantly illustrated by the experience of settlers who, on attempting to clear

and cultivate a cedar swamp, discover that the dead trunks, exhumed undecayed after centuries of immersion, rest above still older cedar-forests, seemingly unaffected by the influences which restore alike the oak and the pine to the vegetable mould of the forest soil.

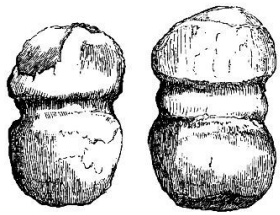


FIG. 64.—Miners' Stone Mauls.

The process of working the ancient mines seems to be tolerably clearly indicated by the discoveries referred to. The soil having been removed by means of wooden spades, doubtless with the aid of copper tools to break up the solid earth and clay: remains of charcoal, met with in numerous instances on the surface of the rock, show that fire was an important agent for overcoming the cohesion between the copper and its matrix. Before the introduction of gunpowder fire was universally employed in excavating rock; and where fuel abounds, as in the old Harz and Altenberg mining districts of Europe, it is even now found to be quite as economical in destroying siliceous rocks. Stone hammers or mauls were next employed to break up the metalliferous rock. These have been found in immense numbers on different mining sites. Mr. Knapp obtained in one locality upwards of ten cart-loads; and I was shown a well at Ontonagon constructed almost entirely out of stone hammers, obtained from ancient workings in the immediate vicinity. Many of these are mere

water-worn boulders of greenstone or porphyry, roughly chipped at the centre, so as to admit of their being secured by a withe around them. But others are well-finished, with a single or double groove for attaching the handle by which they were wielded. They weigh from ten to forty pounds; but many are broken, and some of the specimens I saw were worn and fractured from frequent use.

The extent to which co-operation was carried on by the miners, with the imperfect means at their command, is illustrated by the objects recovered on exploring one of their trenches, on a hill to the south of the Copper Falls mines. On removing the accumulations from the excavation, stone axes of large size made of greenstone, and shaped to receive withe-handles, and some large round greenstone masses that had apparently been used for battering-rams, were found. “They had round holes bored in them to the depth of several inches, which seemed to have been designed for wooden plugs to which withe-handles might be attached, so that several men could swing them with sufficient force to break the rock and the projecting masses of copper. Some of them were broken, and some of the projecting ends of rock exhibited marks of having been battered in the manner here suggested.”[74]

But the industrious miners fully appreciated the practical utility of the metal they were in search of; and it is not to be supposed that they employed themselves thus laboriously in mining copper, and yet themselves used only stone and wooden tools. Copper axes, gads, chisels, and gouges, as well as knives and spear-heads, of considerable diversity of form, have been brought to light, all of them wrought from the virgin copper by means of the hammer, without smelting, alloy, or the use of fire.

At Ontonagon, I had an opportunity of examining an interesting collection of mining relics, found a few months before. These consisted of copper tools, with solid triangular blades like bayonets, one fourteen inches, and the others about twelve inches in length; a chisel, and two singularly shaped copper gouges about fourteen inches long and two inches wide, the precise use of which it would be difficult to determine. The whole were discovered buried in a bed of clay on the banks of the river Ontonagon, about a mile above its mouth, during the process of levelling it for the purposes of a brick-field. Above the clay was an alluvial deposit of two feet of sand, and in this, and over the relics of the ancient copper workers, a pine-tree had grown to full maturity. Its gigantic roots gave proof, in the estimation of those who witnessed their removal, of more than two centuries' growth; while the present ordinary level of the river is such that it would require a rise of forty feet to make the deposit of sand beneath which they lay.

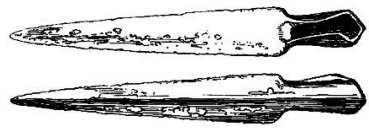


FIG. 65.—Ontonagon Copper Implement.

An experienced practical miner, who had been among the first to reopen some of the ancient works at the Minnesota mine, recognised in the copper gouges implements adapted to produce the singular tool-marks which then excited his curiosity. Subjoined is a representation of a peculiar type of copper tools, sketched from one of those found at Ontonagon. The socket, formed by hammering out the lower part flat, and then turning it over partially

at each side, corresponds to some primitive forms of bronze implements found in Britain and the north of Europe; but the latter are cast of a metallic compound, and prove a skill in metallurgy far in advance of the old metal-workers of Ontonagon.

Another, and in some respects more interesting discovery, was made at a point lying to the cast of Keweenaw Point, in the rich iron district of Marquette, in what appears to have been the ancient bed of the river Carp. About ten feet above the present level of its channel, various weapons and implements of copper were found. Large trees grew over this deposit also, and the evidences of antiquity seemed not less obvious than in that of Ontonagon. The relics included knives, spear or lance-heads, and arrow-heads, some of which were ornamented with silver. One of the knives, made, with its handle, out of a single piece of copper, measured altogether about seven inches long, of which the blade was nearly two-thirds, and of an oval shape. It was ornamented with pieces of silver attached to it, and was inlaid with a stripe of the same metal from point to haft. Numerous fragments and shavings of copper were also found, some of which were such as, it was assumed, could only have been cut by a fine sharp tool; and the whole sufficed to indicate, even more markedly than those at Ontonagon, that not only was the native copper wrought in ancient times in the Lake Superior regions, but that manufactories were established along its shores, and on the banks of its navigable rivers. The recognition of silver as a distinct metal by the present race of Indians is proved by the specific term *shooneya*, by which it is designated in Chippewa; whereas gold is only known as *ozahwah-shooneya*, or yellow silver.



FIG. 66.
Brockville Copper Dagger.

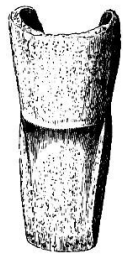


FIG. 67.
Gouge.

In 1856, Dr. Thomas Reynolds of Brockville exhibited to the Canadian Institute a collection of copper and other relics discovered in that neighbourhood under singular circumstances; and possessing a special interest owing to the distance of the site from Lake Superior. They included a peculiarly-shaped chisel or gouge, six inches in length, (Fig. 67), a rude spear-head, seven inches long (Fig. 68), and two small daggers or knives, one of which is shown in Fig. 66, all wrought by means of the hammer, out of native copper which had never been subjected to fire, as is proved by the silver remaining in detached crystals in the copper. They were found at the head of Les Galops Rapids, on the river St. Lawrence, about fifteen feet below the surface, along with twenty skeletons disposed in a circular space with their feet towards the centre. Dr. Reynolds remarks of them: “Some of the skeletons were of gigantic proportions. The lower jaw of one is sufficiently large to surround the corresponding bone of an adult of our present generation. The condition of the bones furnished indisputable proof of their great antiquity. The skulls were so completely reduced to their earthy constituents that they were

exceedingly brittle, and fell in pieces when removed and exposed to the atmosphere. The metallic remains, however, of more enduring material, as also several stone chisels and gouges, and some flint arrow-heads, all remain in their original condition; and furnish evidence of the same rude arts which we know to be still practised by the aborigines of the far West." After discussing the possibility of their European origin, Dr. Reynolds adds: "There is also a curious fact, which these relics appear to confirm, that the Indians possessed the art of hardening and tempering copper, so as to give it as good an edge as iron or steel. This ancient Indian art is now entirely lost."

The reference thus made to the popular theory of some lost art of hardening the native copper, afforded an opportunity of testing it in reference to the Brockville relics. They were accordingly submitted to my colleague, Professor Henry Croft, of University College, Toronto, with the following results: The object of the experiments was to ascertain whether the metal of which the implements are made is identical with the native copper of the Lake Superior mines; or whether it has been subjected to some manufacturing process, or mixed with any other substance, by which its hardness might have been increased. A careful examination established the following conclusions:—No perceptible difference could be observed between the hardness of the implements and that of metallic copper from Lake Superior. The knife or small dagger was cleansed as far as possible from its green coating; and its specific gravity ascertained as 8·66. A fragment, broken off the end of the broad, flat implement, described as a "copper knife of full size," having been freed from its coating, was found to

have a specific gravity of 8·58. During the cleaning of this fragment, a few brilliant white specks became visible on its surface, which appeared, from their colour and lustre, to be silver. The structure of the metal was also highly laminated, as if the instrument had been brought to its present shape by hammering out a solid mass of copper, which had either split up, or had been originally formed of several pieces. These laminæ of course contained air, and the metal was covered with rust, hence the specific gravity. The process by which a flat piece of copper has been overlapped, and wrought with the hammer into a rude spear-head, is shown in the accompanying illustration. A portion of very solid copper, from Lake Superior, of about the same weight as the fragment, was weighed in water, and its gravity found to be 8·92. The specific gravity of absolutely pure copper varies from 8·78 to 8·96, according to the greater or less degree of aggregation it has received during its manufacture. The fragment was completely dissolved by nitric acid; and the solution, on being tested for silver by hydrochloric acid, gave a scarcely perceptible opacity, indicating the presence of an exceedingly minute trace of silver. The copper having been separated by hydro-sulphuric acid, the residual liquid was tested for other metals. A very minute trace of iron was detected. The native copper from Lake Superior was tested in the same manner, and was found to contain no trace of silver, but a minute trace of iron. From this, it appears that the implements are composed of copper almost pure, differing in no material respect from the native copper of Lake Superior.

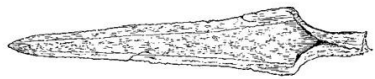


FIG. 68.—Brockville Copper Spear.

It is thus apparent that, in the case of the Brockville relics, the theory of a lost art of hardening and tempering copper was a mere reflex of the prevalent popular fallacy; and there is no reason for anticipating a different result in other cases in which the same theory is tested.

More recently a well-finished dagger of hammered copper, nine inches long, and a smaller copper gouge, have been turned up by the plough: the former at Burnhamthorpe, and the latter at Chinguacousy, in Ontario; and from time to time similar discoveries suffice to show the ancient diffusion of the native copper throughout the whole region of the great lakes. In his account of the discovery of the Brockville relics, Dr. Reynolds assumes them to pertain to the present Indian race. The evidences of antique sepulture, however, are unmistakable; and other proofs suggest a different origin. Mr. Squier, by whom they had been previously described, remarks in the Appendix to his *Aboriginal Monuments of the State of New York*:[75] "Some implements entirely corresponding with these have been found in Isle Royale, and at other places in and around Lake Superior." But besides the copper implements, there lay in the same deposit a miniature mask of terra-cotta of peculiar workmanship, suggestive rather of relation to the arts of the Mound-Builders. Mr. Squier has figured it from an incorrect drawing, which indicates a minuter representation of Indian features than the original justifies. It is engraved here, the size of the original, from a photographic copy, and, as will be seen, is a rude mask, such as is by no means uncommon among the small terra-cottas of Mexico and Central America. This mingling of traces of a certain amount

of artistic skill with the arts of the primitive metallurgist, entirely corresponds with the disclosures of the ancient mounds of the Mississippi; and, indeed, agrees with other partial manifestations of art in an imperfectly developed civilisation.



FIG. 69.—Terra-cotta Mask.

I was struck, when examining the rude stone mauls of the miners of Ontonagon, by their resemblance to some which I have seen, obtained from ancient copper workings of North Wales. In a communication made to the British Archæological Institute by the Hon. William Owen Stanley, in 1850, he gave an account of an ancient shaft broken into at the copper mines of Llandudno, Carnarvonshire. In this were found mining implements, consisting of chisels, or picks of bronze, and a number of rudely-fashioned stone mauls of various sizes, weighing from about 2 lbs. to 40 lbs. Their appearance suggested that they had been used for breaking, pounding, or detaching the ore from the rock; and the character both of the bronze and stone

implements seems to point to a period long prior to the Roman occupation of Britain. These primitive mauls are stated to be similar to water-worn stones found on the sea-beach at Pen Mawr. Mr. Stanley also describes others, corresponding in like manner to those found on the shores of Lake Superior, which had been met with in ancient workings in Anglesea. Were we, therefore, disposed to generalise from such analogies, as ingenious speculators on the lost history of the New World have been prone to do, we might trace in this correspondence a confirmation of the supposed colonisation of America, in the twelfth century, by Madoc, the son of Owen Gwynnedd, king of North Wales. But the resemblance between the primitive Welsh and American mining tools, can be regarded only as evidence of the corresponding operations of the human mind, when placed under similar circumstances, and with the same limited means, which is illustrated in so many ways by the arts of the stone-period, whether of the most ancient or of modern date. Nor can such correspondences be regarded as altogether accidental. They confirm the idea of certain innate and instinctive operations of human ingenuity, ever present and ready to be called forth for the accomplishment of similar purposes by the same limited means.

From this review of the evidences of long-abandoned mining operations on the shores and islands of Lake Superior, it cannot admit of doubt that in them we look on the traces of an imperfectly developed yet highly interesting native civilisation, pertaining to centuries long anterior to the discovery of America in the fifteenth century. The question naturally arises: By whom were those ancient mines wrought? Was it by the ancestry of the present Indian tribes of North America, or by a distinct and

long-superseded race? The tendency of opinion among American writers has been towards a unity and comprehensive isolation of the races and arts of the New World. Hence the theories alike of Morton and of Schoolcraft, though founded on diverse premises, favour the idea that the germs of all that is most noticeable even in the civilisation of Central America may be found among the native arts, and the manners and customs of the forest tribes. But neither the traditions nor the arts of the Indians of the northern lakes supply any satisfactory link connecting them with the Copper-Miners or the Mound-Builders. Of Loonsfoot, an old Chippewa chief of Lake Superior, the improbable statement is made that he could trace back his ancestry by name, as hereditary chiefs of his tribe, for upwards of four hundred years. At the request of Mr. Whittlesey he was questioned by an educated half-breed, a nephew of his own, relative to the ancient copper mines, and his answer was in substance as follows:—"A long time ago the Indians were much better off than they are now. They had copper axes, arrow-heads, and spears, and also stone axes. Until the French came here, and blasted the rocks with powder, we have no traditions of the copper mines being worked. Our forefathers used to build big canoes and cross the lake over to Isle Royale, where they found more copper than anywhere else. The stone hammers that are now found in the old diggings we know nothing about. The Indians were formerly much more numerous and happier. They had no such wars and troubles as they have now." At La Pointe on Lake Superior, it was my good fortune to meet with *Beshekee*, or Buffalo, a rugged specimen of an old Chippewa chief. He retained all the wild Indian ideas, though accustomed to frequent intercourse

with white men; boasted of the scalps he had taken; and held to his pagan creed as the only religion for the Indian, whatever the Great Spirit might have taught the white man. His grandson, an educated half-breed, acted as interpreter, and his reply to similar inquiries was embodied in the following sententious declaration of Indian philosophy:—"The white man thinks he is the superior of the Indian, but it is not so. The Red Indian was made by the Great Spirit, who made the forests and the game, and he needs no lessons from the white man how to live. If the same Great Spirit made the white man, he has made him of a different nature. Let him act according to his nature; it is the best for him; but for us it is not good. We had the red-iron before white men brought the black-iron amongst us; but if ever such works as you describe were carried on along these Lake shores before white men came here, then the Great Spirit must once before have made men with a different nature from his red children, such as you white men have. As for us, we live as our forefathers have always done."

La Pointe, or Chaquamegon, where this interview took place, was visited by the Jesuit Father, Claude Alloüez, in 1666, and is described by him as a beautiful bay, the shores of which were occupied by the Chippewas in such numbers that their warriors alone amounted to eight hundred. In the journal of his travels, he thus refers to the mineral resources for which the region is now most famed:—"The savages reverence the lake as a divinity, and offer sacrifices to it because of its great size, for it is two hundred leagues long and eighty broad; and also, because of the abundance of fish it supplies to them, in lieu of game, which is scarce in its environs. They often find in the lake pieces of copper weighing from ten to

twenty pounds. I have seen many such pieces in the hands of the savages; and as they are superstitious, they regard them as divinities, or as gifts which the gods who dwell beneath its waters have bestowed on them to promote their welfare. Hence they preserve such pieces of copper wrapped up along with their most prized possessions. By some they have been preserved upwards of fifty years, and others have had them in their families from time immemorial, cherishing them as their household gods. There was visible for some time, near the shore, a large rock entirely of copper, with its top rising above the water, which afforded an opportunity for those passing to cut pieces from it. But when I passed in that vicinity nothing could be seen of it. I believe that the storms, which are here very frequent, and as violent as on the ocean, had covered the rock with sand. Our Indians wished to persuade me it was a divinity which had disappeared, but for what reason they would not say."[76]

Such is the earliest notice we have of Indian ideas relative to the native copper. It accords with all later information on the same subject, and is opposed to any tradition of their ancestors having been the workers of the abandoned copper mines. A secrecy, resulting from the superstitions associated with the mineral wealth of the great Lake, appears to have thrown impediments in the way of inquirers. Father Dablon narrates a marvellous account communicated to him, of four Indians who, in old times, before the coming of the French, had lost their way in a fog, and at length effected a landing on Missipicooatong. This was believed to be a floating island, mysteriously variable in its local position and aspects. The wanderers cooked their meal in Indian fashion, by heating stones and casting them into a

birch-bark pail filled with water. The stones proved to be lumps of copper, which they carried off with them; but they had hardly left the shore when a loud and angry voice, ascribed by one of them to Missibizi, the goblin spirit of the waters, was heard exclaiming, “What thieves are these that carry off my children’s cradles and playthings?” One of the Indians died immediately from fear, and two others soon after, while the fourth only survived long enough to reach home and relate what had happened, before he also died: having no doubt been poisoned by the copper used in cooking. Ever after this the Indians steered their course far off the site of the haunted island. In the same relation, Father Dablon tells that near the river Ontonagon, or Nantonagon as he calls it, is a bluff from which masses of copper frequently fall out. One of these presented to him weighed one hundred pounds; and pieces weighing twenty or thirty pounds are stated by him to be frequently met with by the squaws when digging holes for their corn. The locality thus celebrated by the earliest French missionaries for its traces of mineral wealth, is in like manner referred to by the first English explorer, Alexander Henry: a bold adventurer, who visited the island of Mackinac, at the entrance of Lake Michigan, shortly before the Treaty of Paris in 1763, and was one among the few who escaped a treacherous massacre perpetrated by the Indians on the Whites at Old Fort Mackinac. In his *Travels and Adventures in Canada and the Indian Territories*, he mentions his visiting the river Ontonagon, in 1765, and adds, “I found this river chiefly remarkable for the abundance of virgin copper which is on its banks and in its neighbourhood. The copper presented itself to the eye in masses of various weight. The Indians showed

me one of twenty pounds. They were used to manufacture this metal into spoons and bracelets for themselves. In the perfect state in which they found it, it required nothing but to be beat into shape."[77] In the following year, Henry again visited the same region. "On my way," he says, "I encamped a second time at the mouth of the Ontonagon, and now took the opportunity of going ten miles up the river with Indian guides. The object which I went most expressly to see, and to which I had the satisfaction of being led, was a mass of copper, of the weight, according to my estimate, of no less than five tons. Such was its pure and malleable state that with an axe I was able to cut off a portion weighing a hundred pounds." This mass of native copper which thus attracted the adventurous European explorer upwards of a century ago, has since acquired considerable celebrity, as one of the most prominent encouragements to the mining operations projected in the Ontonagon and surrounding districts. It is now preserved at Washington, and is believed to be the same to which Charlevoix refers as a sacrificial block held in peculiar veneration by the Indians; and on which, according to their narration, a young girl had been sacrificed. The Jesuit father did not obtain access to it, as it was the belief of the Indians that if it were seen by a white man, their lands would pass away from them. Those various notices are interesting as showing to what extent the present race of Indians were accustomed to avail themselves of the mineral wealth of the copper regions. Illustrations of a like kind might be multiplied, but they are all nearly to the same effect, exhibiting the Indian gathering chance masses, or hewing off pieces from the exposed copper lodes, in full accordance with the simple arts of his first Stone Period; but

affording no ground for crediting him with any traditionary memorials of connection with the race that once excavated the trenches, and laid bare the mineral treasures of the great copper region.

The evidence indicative of the great length of time which has intervened since the miners of Lake Superior abandoned its shores, receives confirmation from traces of a long protracted traffic carried on by the subsequent occupants of their deserted territory. The mineral wealth that still lay within reach of the non-industrial hunter of the forests which grew up and clothed the deserted works, in the interval between their abandonment and re-occupation, furnished him with a prized material for barter. The head-waters of the Mississippi are within easy reach of an Indian party, carrying light birch-bark canoes over the intervening portages; and, once launched on its broad waters, the whole range of the continent through twenty degrees of latitude is free before them. Through Lake Huron and the Ottawa into the St. Lawrence, and by Lakes Huron, Erie, and Ontario, into the Hudson, other extensive areas of native exchange were commanded. Articles wrought in the brown pipe-stone of the Upper Mississippi, the red pipe-stone of the Couteau des Prairies, west of St. Peters, and the copper of Lake Superior, constituted the wealth which the old north had to offer. In return, one of the most valued exchanges appears to have been the large tropical shells of the Gulf of Florida and the West Indian seas: from which wampum-beads, pendants, gorgets, and personal ornaments of various kinds were manufactured.

Copper is obtained in its native state still farther north; and Mackenzie, in his *Second Journey*, mentions its being in common use among the tribes on the borders of the Arctic Sea; by whom it is

wrought into spear and arrow-heads, and a considerable variety of personal ornaments. Mr. Henry found the Christinaux of Lake Winipagon wearing bracelets and other ornaments of copper; and most of the earlier explorers describe copper implements and personal ornaments among widely-scattered Indian tribes of the New World. But in all cases they appear to have been rudely wrought with the hammer, and sparingly mingled with the more abundant weapons and implements of stone, of a people whose sole metallurgic knowledge consisted in gathering or procuring by barter the native copper,—just as they procured the red or brown pipe-stone,—and hammering the mass into some simple useful form. Silver, procured in like manner, was not unknown to them; and pipes inlaid both with silver and lead are by no means rare. But it is only when we turn to the scenes of a native-born civilisation, in Mexico, Central America, and Peru, where metallurgic arts were developed, that we discover evidence of the use of the crucible and furnace, and find copper superseded by the more useful alloy, bronze.

But intermediately between the copper regions of Lake Superior and the ancient southern scenes of native American civilisation, the Mississippi and its great tributaries drain a country remarkable for monuments of a long forgotten past, not less interesting and mysterious than the forsaken mines of Keweenaw and Ontonagon, or Isle Royale. Those great earthworks are ascribed to an extinct race, conveniently known by the name of the Mound-Builders. Careful investigations into their structure and contents prove these builders to have been a people among whom copper was in frequent use, but by them also it was worked only by the hammer. The

invaluable service of fire in reducing and smelting ores, moulding metals, and adapting them to greater usefulness by well-proportioned alloys, was unknown; and the investigation and analysis of their cold-wrought tools seem to prove that the source of their copper was the Lake Superior mines. But though the ancient Mound-Builder was thus possessed of little higher metallurgic knowledge than the Indian hunter: he manifested in other respects a capacity for extensive and combined operations, the memorials of which perpetuate his monumental skill and persevering industry in the gigantic earthworks from whence his name is derived. From these we learn that there was a period in America's unrecorded history, when the valleys of the Mississippi and its tributaries were occupied by a numerous settled population. Alike in physical conformation—so far as very imperfect evidence goes,—and in some of their arts, these Mound-Builders approximated to races of Central and South America, and differed from the Red Indian occupants of their deserted seats. They were not, to all appearance, far advanced in civilisation. Compared with the people of Mexico or Central America when first seen by the Spaniards, their social and intellectual development was probably rudimentary. But they had advanced beyond that stage in which it is possible for a people to continue unprogressive. The initial steps of civilisation had been inaugurated; and the difference between them and the civilised Mexicans is less striking than the contrast which the evidences of their settled condition, and the proofs of extensive co-operation in their numerous earthworks supply, when compared with all that pertains to the tribes by whom the American forests and prairies have been exclusively occupied during the centuries

since Columbus.

The Mound-Builders were greatly more in advance of the Indian hunter than behind the civilised Mexican. They had acquired habits of combined industry; were the settled occupants of specific territories; and are proved, by numerous ornaments and implements of copper deposited in their monuments and sepulchres, to have been familiar with the mineral resources of the northern lake regions, whether by personal enterprise, or by a system of exchange. What probabilities there are suggestive of a connection between the Mound-Builders and the ancient Miners will be discussed in a later chapter, along with other and allied questions; but to just such a race, with their imperfect mechanical skill, their partially developed arts, and their aptitude for continuous combined operations, may be ascribed, *à priori*, such mining works as are still traceable on the shores of Lake Superior, overshadowed with the forest growth of centuries. The mounds constructed by the ancient race are in like manner overgrown with the evidences of their long desertion; and the condition in which recent travellers have found the ruined cities of Central America, may serve to show what even New York, Washington, and Philadelphia: what Toronto, Montreal, and Quebec, would become after a very few centuries, if abandoned, like the desolate cities of Chichenitza or Uxmal, to the inextinguishable luxuriance of the American forest growth.

The accumulations of vegetable mould, the buried forests of older generations, and the living trees with their roots entwined among the forsaken implements of the miners, all point to the lapse of many centuries since their works were abandoned.

Changes wrought on the river-courses and terraces in the Ohio valleys suggest an interval of even longer duration since the construction of the great earthworks with which that region abounds. But to whatever period the working of the ancient copper mines of Lake Superior be assigned, the aspect presented by some of them when reopened in recent years is suggestive of peculiar circumstances attending their desertion. It is inconceivable that the huge mass of copper discovered in the Minnesota mine, resting on its oaken cradle, beneath the accumulations of centuries, was abandoned merely because the workmen, who had overcome the greatest difficulties in its removal, were baffled in the subsequent stages of their operations, and contented themselves by chipping off any accessible projecting point. Well-hammered copper chisels, such as lay alongside of it, and have been repeatedly found in the works, were sufficient, with the help of stone hammers, to enable them to cut it into portable pieces. If, indeed, the ancient miners were incapable of doing more with their mass of copper, in the mine, than breaking off a few projections, to what further use could they have turned it when transported to the surface? It weighed upwards of six tons, and measured ten feet long and three feet wide. The trench at its greatest depth was twenty-six feet; while the mass was only eighteen feet from the surface; and in the estimation of the skilled engineer by whom it was first seen, it had been elevated upwards of five feet since it was placed on its oaken frame. The excavations to a depth of twenty-six feet, the dislodged copper block, and the framework prepared for elevating the solid mass to the surface, all consistently point to the same workmen. But the mere detachment of a few accessible projecting

fragments is too lame and impotent a conclusion of proceedings carried thus far on so different a scale. It indicates rather such results as would follow at the present day were the Indians of the North-west to displace the modern Minnesota miners, and possess themselves of mineral treasures which they are as little capable as ever of turning to any but the most simple uses.

Such evidences, accordingly, while they serve to prove the existence, at some remote period, of a mining population in the copper regions of Lake Superior, seem also to indicate that their labours came to an abrupt termination. Whether by some devastating pestilence, like that which nearly exterminated the native population of New England immediately before the landing of the Pilgrim Fathers; by the breaking out of war; or, as seems not less probable, by the invasion of the mineral region by a barbarian race, ignorant of all the arts of the ancient Mound-Builders of the Mississippi, and of the miners of Lake Superior: certain it is that the works have been abandoned, leaving the quarried metal, the laboriously wrought hammers, and the ingenious copper tools, just as they may have been left when the shadows of the evening told their long forgotten owners that the labours of the day were at an end, but for which they never returned. Nor during the centuries which have elapsed since the forest reclaimed the deserted trenches for its own, does any trace seem to indicate that a native population again sought to avail itself of their mineral treasures, beyond the manufacture of such scattered fragments as lay upon the surface.

[74] Squier's *Aboriginal Monuments of the State of New York*. Appendix, p. 184.

[75] *Smithsonian Contributions*, vol. ii. pp. 14, 176.

[76] *Relations des Jésuites*, vol. iii. 1666 *et* 1667.

[77] Henry's *Travels and Adventures*, New York, 1809, p. 194.

CHAPTER IX.

ALLOYS.

THE AGE OF BRONZE—AN INTERMEDIATE COPPER AGE—EUROPEAN COPPER IMPLEMENTS—NATIVE SILVER AND COPPER—TIN AND COPPER ORES—THE CASSITERIDES—ANCIENT SOURCES OF TIN—ARTS OF YUCATAN—ALLOYED COPPER AXE-BLADES—BRONZE SILVER-MINING TOOL—PERUVIAN BRONZES—PRIMITIVE MINING TOOLS—NATIVE METALLURGIC PROCESSES—METALLIC TREASURES OF THE INCAS—TRACES OF AN OLDER RACE—PERUVIAN HISTORY—THE TOLTECS AND MEXICANS—ADJUSTMENT OF CALENDAR—BARBARIAN EXCESSES—NATIVE GOLDSMITH'S WORK—PANAMA GOLD RELICS—MEXICAN METALLIC CURRENCY—EXPERIMENTAL PROCESSES—ANCIENT EUROPEAN BRONZES—TESTS OF CIVILISATION—ANCIENT AMERICAN BRONZES—THE NATIVE METALLURGIST.

The age of bronze in the archæological history of European civilisation symbolises a transitional stage of very partial development, and imperfect materials and arts, through which the Old World passed in its progress towards the maturity of true historic times; but the Bronze Period of the New World is the

highest stage of its self-developed civilisation, prior to the intrusion of European arts. Whether we regard the bronze implements of Britain and the North of Europe as concomitant with the intrusion of new races, or only as proofs of the discovery or introduction of a new art pregnant with many civilising and elevating tendencies, they constitute an important element in primitive ethnology. For a time they necessarily coincide with many monuments and works of art pertaining in character to the stone-period; just as the stone implements and weapons still manufactured by the Indians and Esquimaux are contemporaneous with many products of foreign metallurgy, but nevertheless are the perpetuation of processes developed in a period when metallurgic arts were entirely unknown. The evidence that the British Bronze Period followed a simpler and ruder one of stone is such as scarcely to admit of challenge, independent of the *à priori* likelihood in favour of this order of succession. The question however suggests itself whether metallurgy did not find its natural beginning there, as elsewhere, in the easy working of the virgin copper, and so intercalate a copper age between Europe's stone, and its true Bronze Period. On this subject Dr. Latham remarks, in his *Ethnology of the British Islands*, "Copper is a metal of which, in its unalloyed state, no relics have been found in England. Stone and bone first; then bronze, or copper and tin combined; but no copper alone. I cannot get over this hiatus; cannot imagine a metallurgic industry beginning with the use of alloys." It is a mistake, however, to say that no unalloyed British copper relics have been found. No very special attention was directed till recently to the distinction. Nearly all the earlier writers who refer to the metallic weapons and tools of ancient Mexico

and Central America, apply the term “copper” to the mixed metal of which these were made; while among European antiquaries the corresponding relics of the Old World are no less invariably designated bronze, though in many cases thus taking for granted what analysis can alone determine. It is an error, however, that the later nomenclature of archæological periods has tended to strengthen: partly from the lack of appreciation of the importance of the argument in favour of the first use of the metals in a condition corresponding to the most primitive arts, and the discovery of scientific processes at later stages.

This peculiar interest attaches to the metallurgy of the New World, that there all the earlier stages are clearly defined: the pure native metal, wrought by the hammer without the aid of fire; the melted and moulded copper; the alloyed bronze; and then the smelting, soldering, graving, and other processes resulting from accumulating experience and matured skill. But examples of British implements of pure copper have also been noted. In a valuable paper by Mr. J. A. Phillips, on the metals and alloys known to the ancients,[78] the results of analyses of thirty-seven ancient bronzes are given. Among these are included three swords, one from the Thames, the others from Ireland; a spear-head, two celts, and two axe-heads: all of types well-known among the weapons of the “Bronze Period.” Yet of the eight articles thus selected as examples of “bronze” weapons, one, the spear-head, proved on analysis to be of impure but unalloyed copper. Its composition is given as copper, 99·71; sulphur, ·28. In 1822, Sir David Brewster described a large battle-axe of pure copper, found at a depth of twenty feet in Ratho Bog, near Edinburgh, under circumstances scarcely less remarkable than some of the discoveries of works of

art in the drift. The workmen dug down through nine feet of moss and seven feet of sand, before they came to the hard black till-clay; and at a depth of four feet in the clay the axe was found. The author accordingly remarks: “It must have been deposited along with the blue clay prior to the formation of the superincumbent stratum of sand, and must have existed before the diluvial operations by which that stratum was formed. This opinion of its antiquity is strongly confirmed by the peculiarity of its shape, and the nature of its composition.”[79] In 1850, my brother, Dr. George Wilson, undertook a series of analyses of ancient British bronzes for me, and out of seven specimens selected for experiment, one Scottish axe-head, rudely cast, apparently in sand, was of nearly pure copper.[80] Of eight specimens of metal implements selected for me by Mr. Thomas Ewbank, of New York, as examples of Peruvian bronze; four of them, on analysis, proved to be of unalloyed copper. The rich collections of the Royal Irish Academy furnish interesting confirmation of this idea of a transitional copper era. Dr. Wilde remarks, in his Catalogue of Antiquities, “Upon careful examination, it has been found that thirty of the rudest, and apparently the very oldest celts, are of red, almost unalloyed copper.” In addition to those there are also two battle-axes, a sword-blade, a trumpet, several fibulæ, and some rudely formed tools, all of copper; and now that attention has been directed to the subject, further examples of the same class will doubtless accumulate.

A very important difference, however, distinguishes the mineral resources of the British and the North American copper regions. Copper, as we have seen, occurs in the trappean rocks of Keweenaw and Ontonagon, in masses of many tons weight; and

detached blocks of various sizes lie scattered about in the superficial soil or exposed along the lake shore, ready for use without any preparatory skill, or the slightest knowledge of metallurgy. Nature in her own vast crucibles had carried the metal ores through all their preparatory stages, and left them there for man to shape into such forms as his convenience or simplest wants suggested. The native silver had undergone the like preparation, and is of frequent occurrence as a perfectly pure metal, being found, even when interspersed in the mass of copper, still in distinct crystals, entirely free from alloy with it. But neither tin nor zinc occurs throughout the whole northern region to suggest to the native metallurgist the production of that valuable alloy which is indissolubly associated with the civilisation of Europe's Bronze age. In Britain it is altogether different. The tin and copper lie together, ready for alloy, but both occur in the state of impure ores, inviting and necessitating the development of metallurgy before they can be turned to economic uses. Tin is obtained in Cornwall almost entirely from its peroxide; and copper occurs there chiefly combined with sulphur and iron, forming the double sulphuret which is commonly called copper pyrites or yellow copper ore. The smelting process to which it has to be subjected is a laborious and complicated one; and if we are prepared to believe in the civilisation of Britain's Bronze Period as a thing of native growth, the early discovery and use of alloys very slightly affects the question.

The ancient American miner of Lake Superior never learned to subject his wealth of copper to the action of fire, and transfer it from the crucible to the shapely mould. No such process was needed where it abounded in inexhaustible quantities in a pure

metallic state. If, in the midst of such readily available metallic resources, he was found to have used tools of bronze or brass, to have transported the tin or zinc of other regions to his furnaces, and to have laboriously converted the whole into a preferable substitute for the simpler metal that lay ready for his use, it would be difficult indeed to conceive of such as the initial stage in his metallurgy industry. But Britain presents no analogy to this in its development of metallurgy arts. Tin, one of the least widely-diffused of metals, is found there in the greatest abundance, and easily accessible, not as a pure metal, but as an ore which is readily reduced by charcoal and a moderate degree of heat to that condition. This was the metallic wealth for which Britain was sought by the ancient traders of Massilia, and the fleets of the Mediterranean; and on it we may therefore assume her primitive metallurgists to have first tried their simple arts. But alongside of it, and even in natural combination with it, as in tin pyrites and the double sulphuret, lies the copper, also in the condition of an ore, and requiring the application of the metallurgist's skill before it can be turned to account. We know that at the very dawn of history tin was exported from Britain. Copper also appears to have been wrought, from very early times, in North Wales as well as in Cornwall. Both metals were found rarely, and in small quantities, in the native state, but these may have sufficed to suggest the next step of supplying them in larger quantities from the ores. To seek in some unknown foreign source for the origin of metallurgic arts, which had there all the requisite elements for evoking them, seems wholly gratuitous; and, if once the native metallurgist learned to smelt the tin and copper ores, and so had been necessitated to subject

them to preparatory processes of fire, the next stage in progressive metallurgy, the use of alloys, was a simple one. It might further be assumed that, with the discovery of the valuable results arising from the admixture of tin with copper, the few pure copper implements—excepting where already deposited among sepulchral offerings,—would for the most part be returned to the melting-pot, and reproduced in the more perfect and useful condition of the bronze alloy. There seems, however, greater probability in the supposition that if Britain had a copper period, or age of unalloyed metals, it was of brief duration.

The *cassiteron*, or tin which made the British Islands famous among Phœnician and Greek mariners, long before the Roman legions ventured to cross the narrow seas, was derived, as has been noted, from the same south-western peninsula, where copper is still wrought. The name of Cassiterides, or Tin Islands, bestowed on Cornwall and the adjacent isles, seems to imply that tin was the chief export, and was transported to the Mediterranean, to be mixed with the copper of the Wady Maghara, and other Asiatic mines, to form the Egyptian, Phœnician, and Assyrian bronze. Tin, therefore, the easiest of all metals to subject to the requisite processes, first engaged the skill of the British metallurgist; and that mastered, the proximity of the copper ore in the same mineral districts, inevitably suggests all the subsequent processes of smelting, fusion, and alloy.

The practical value of the alloy of copper and tin was well-known both to the Phœnicians and the Egyptians. Tin occurs in considerable abundance, and in the purest state, in the peninsula of Malacca, and thence, probably, it was first brought to give a

new impetus to early eastern civilisation. Britain is its next and its most abundant source; and since America was embraced within the world's sisterhood of nations, Chili and Mexico have become known as productive sources of the same useful metal. But the mineral wealth of Mexico and Peru was familiar to nations of the New World long before it was made to contribute to European commerce; and to a proximity of the metals best suited for the first stages of human progress, corresponding in some degree to that to which Britain's ancient metallurgy has been traced, the curious phases of a native and purely aboriginal civilisation may be ascribed, which revealed itself to the wondering gaze of the first European adventurers who followed in the steps of Columbus. Whatever doubts may arise relative to the native origin of British metallurgy, and the works of art of the European Bronze Period, in consequence of their most characteristic illustrations being preserved in the mixed metal, bronze, and not in pure copper: there is no room for any such doubts relative to the primitive metallurgy of the New World. The American continent appears to have had its two entirely independent centres of self-originated metallurgic arts: its greatly prolonged but slight progressive Copper Period; and apart from this, and in part at least contemporaneous with it, a separate Bronze Period, with its distinct centres of more advanced civilisation and better regulated metallurgic industry, in which the value of metallic alloys was practically understood.

The great copper region of North America lies along the shores of Lake Superior, and on its larger islands between the 46th and 48th parallels of north latitude; and from thence its metallic treasures were diffused by primitive commercial exchanges,

throughout the whole vast regions watered by the Mississippi and its tributaries: including also the Atlantic states, and the shores of the great lakes. But southward and westward of this area of diffusion, the Rio Grande and its tributaries, with the Rio Colorado, drain a country modified by very diverse conditions of climate, and having a totally distinct centre of metallurgic wealth and civilising influences. In this central region of the twin continents of America, as well as independently in tropical Peru, native civilisation had advanced a considerable way, before it was arrested and destroyed by the aggressions of foreign intruders. The peculiar advantages derivable from the proximity of the distinct metals had been discovered, and metallurgy had been developed into the practical arts of a true American Bronze Age.

When Columbus, during his fourth voyage, landed on one of the Guanaja islands, before making the adjoining mainland of Honduras, it was visited by a large trading canoe, the size and freight of which equally attracted his notice. It was eight feet wide, and in magnitude like a galley, though formed of the trunk of a single tree. In the centre a raised awning covered and enclosed a cabin, in which sat a cacique with his wives and children; and twenty-five rowers propelled it swiftly through the water. The barque is believed to have come from the province of Yucatan, then about forty leagues distant, through a sea the stormy violence of which had daunted the most hardy Spanish seamen. It was freighted with a great variety of articles of manufacture, and of the natural produce of the neighbouring continent; and among them Herrara specifies “small hatchets, made of copper, small bells and plates, *crucibles to melt copper*, etc.” Here, at length, was the true answer to

that prophetic faith which upheld the great discoverer, when, peering through the darkness, the New World revealed itself to his eye in the glimmering torch, which told him of an unseen land inhabited by man. Here was evidence of the intelligent service of fire. Well indeed might it have been for Columbus had he been obedient to the voice that thus directed his way. All the accompaniments of the voyagers furnished evidence of civilisation. They were clothed with cotton mantles. Their bread was made of Indian corn, and from it also they had brewed a beverage resembling beer. They informed Columbus that they had just arrived from a country, rich, populous, and industrious, situated to the west; and urged him to steer in that direction. But his mind was bent on the discovery of the imaginary strait that was to lead him directly into the Indian seas, and it was left to Cortez to discover the singular seats of native civilisation of Mexico and Central America.

When at length the mainland was reached, the abundance and extensive use of the metals became apparent; and as further discoveries brought to the knowledge of the Spaniards the opulent and civilised countries of Yucatan, Mexico, and Peru, they were more and more astonished by the native metallic wealth. When the Spaniards first entered the province of Tuspan, they mistook the bright copper or bronze axes of the natives for gold, and were greatly mortified after having accumulated them in considerable numbers to discover the mistake they had made. Bernal Diaz narrates that “each Indian had, besides his ornaments of gold, a copper axe, which was very highly polished, with the handle curiously carved, as if to serve equally for an ornament, as for the field of battle. We first thought

these axes were made of an inferior kind of gold; we therefore commenced taking them in exchange, and in the space of two days had collected more than six hundred; with which we were no less rejoiced, as long as we were ignorant of their real value, than the Indians with our glass beads."

Ancient Mexican paintings show that the tribute due by certain provinces of the Mexican empire was paid in wedges of copper; and Dupaix describes and figures examples of a deposit of two hundred and seventy-six axe-heads, cast of alloyed copper, such as, he observes, "are much sought by the silversmiths on account of their fine alloy." The forms of these, as well as of the chisels and other tools of bronze, are simple, and indicate no great ingenuity in adapting the moulded metal to the more perfect accomplishment of the artificer's or the combatant's requirements. The methods of hafting the axe-blade, as illustrated by Mexican paintings, are nearly all of the same rude description as are employed by the modern savage in fitting a handle to his hatchet of flint or stone; and, indeed, the whole characteristics of the metallurgic and artistic ingenuity of Mexico and Peru are suggestive of immature development; though, from the nature of Peruvian institutions, the civilisation of the latter, like that of China, may have long existed, with slight and intermittent manifestations of progress. It was indeed, in many respects, the transitional Bronze Period of the New World, in which not only the arts of an elder stone-period had been very partially modified by metallurgic influences, but in which the sword, or *mahguahuitl*, made of wood, with blades of obsidian inserted along its edge, the flint or obsidian arrow-head, the stone hatchet, and other weapons, were still in common use, along with those of metal.

Yet such traces of primitive arts are accompanied with remarkable evidence of progress in some directions. Humboldt remarks, in his *Vues des Cordillères*, on the surprising dexterity shown by the Peruvians in cutting the hardest stones; and, after reference to the observations of other travellers, he adds:—"I conjectured that the Peruvians had tools of copper, which, mixed with a certain proportion of tin, acquires great hardness. This conjecture has been justified by the discovery of an ancient Peruvian chisel, found at Vilcabamba, near Cuzco, in a silver mine worked in the time of the Incas. This valuable instrument, for which I am indebted to the friendship of the Padre Narcisse Gilbar, is four and seven-tenth inches long, and four-fifths of an inch broad. The metal of which it is composed has been analysed by M. Vauquelin, who found in it 0·94 of copper, and 0·06 of tin." Unfortunately, the composition of Mexican and Peruvian bronzes has hitherto attracted so little attention, that it is impossible to obtain many accurate records of analyses, or to procure specimens to submit to chemical tests. Dr. J. H. Gibbon, of the United States Mint, favoured me with the analysis of another chisel or crowbar, brought from the neighbourhood of Cuzco by his son, Lieutenant Lardner Gibbon, who formed one of the members of the Amazon Expedition. Through the kind services of Mr. Thomas Ewbank, of the American Ethnological Society, I also obtained, in addition to results determined by himself, eight specimens of such Peruvian implements, though only a portion of them proved to be of metallic alloys. They were submitted to careful analysis by my colleague, Professor Henry Croft, and the results in reference to the bronzes are given on a subsequent page. Mr. Squier, in the Appendix to his *Aboriginal*

Monuments of the State of New York, engraves an implement found with various Peruvian knives and chisels, about the person of a mummy, taken by Mr. J. H. Blake, of Boston, from an ancient cemetery near Arica. On analysis, it proved to contain about four per cent. of tin. More recently I inspected a valuable collection of antiquities brought by Mr. Blake from Peru, including a variety of bronze implements; and he has favoured me with the following results:—"Many years ago, I made a series of analyses of bronze instruments, knives, chisels, hoes, etc., which I found in ancient cemeteries in Peru in connection with embalmed bodies. I have not been able to find my notes made at the time; but I know that they consisted of copper and tin only, and that the proportion of the latter varied from upwards of two to four per cent. After receiving your last letter, I made an analysis of a small knife found by me, with many other articles, with the body of a man, in the ancient cemetery near Arica, in South Peru. The handle is of the same metal as the blade, and at right angles with it, being joined at the middle. The end is fashioned to represent the head of a llama. On analysis, the composition proves to be: Copper, 97·87; tin, 2·13." Dr. C. T. Jackson communicated another analysis of a "Chilian bronze instrument, probably a crowbar," to the Boston Natural History Society. It contained 7·615 parts of tin, and is described by him as a bronze, well adapted for such instruments as were to be hammer-hardened.[81] The general results indicate a variable range of the tin alloy, from 2·130 to 7·615 per cent.; which, in so far as any general inference can be drawn from so small a number of examples, shows a more indeterminate and partially developed metallurgy than the analyses of primitive European bronzes disclose.

Such is all the evidence I have been able to obtain relative to the composition of Peruvian alloys, and the progress indicated thereby in scientific metallurgy. It accords with other evidence of their mining operations. During a recent visit to Peru Mr. James Douglas obtained for me a set of primitive stone mining implements recovered from an ancient shaft, exposed in working the Brillador mine, in the Province of Coquimbo, Chili. They consist of a maul of granite, eight inches long, with a groove wrought round the centre and over the thicker end; one of diorite, also with a groove about one-third from the thicker end; a conical hammer of granite; and another implement made of diorite, apparently designed for pounding the copper ore. It has indentations worked in the sides for the fingers and thumb; and when found was covered at one end with green oxide of copper, as if from use in pounding the ore. Near the mine are ancient graves indicated by circles of stones; within which the skeletons are disposed in a sitting posture, accompanied by conical bones and rude pottery. Such mining implements were, no doubt, supplemented with others of metal; but so far as they illustrate the progress of the ancient miners of Chili, the evidence fully accords with the ideas otherwise formed of the Peruvians as a people who had discovered for themselves the rudiments of civilisation, but who had as yet very partially attained to any mastery of the arts which have been matured in modern centuries for Europe. This agrees with the description furnished by Dr. Tschudi of some of the metallurgic processes still practised in Peru. “The Cordillera, in the neighbourhood of Yauli,” he remarks, “is exceedingly rich in lead ore containing silver. Within the circuit of a few miles above eight hundred shafts have been

made, but they have not been found sufficiently productive to encourage extensive mining works. The difficulties which impede mine-working in these parts are caused chiefly by the dearness of labour and the scarcity of fuel. There being a total want of wood, the only fuel that can be obtained consists of the dried dung of sheep, llamas, and huanacos. This fuel is called *taquia*. It produces a very brisk and intense flame, and most of the mine-owners prefer it to coal. The process of smelting, as practised by the Indians, though extremely rude and imperfect, is adapted to local circumstances. All European attempts to improve the system of smelting in these districts have either totally failed, or in their results have proved less effective than the simple Indian method. The Indian furnaces can, moreover, be easily erected in the vicinity of the mines, and when the metal is not very abundant the furnaces may be abandoned without any great sacrifice. For the price of one European furnace the Indians may build more than a dozen, in each of which, notwithstanding the paucity of fuel, a considerably greater quantity of metal may be smelted than in one of European construction." At the village of Yauli, near the mines referred to, situated at an elevation of 13,100 feet above the sea, from twelve to fourteen thousand Indians are congregated together, chiefly engaged in mining, after the fashion handed down to them from generations before the Conquest. Their processes correspond with the imperfect results disclosed by the analysis of native alloys; as well as by other proofs that the Peruvians were also accustomed to work the native copper into tools and personal ornaments for common use, very much in the same fashion as the ancient metallurgists of the Ohio valley.

The contrast which the civilisation alike of Mexico and Peru presents, when compared with the highest arts pertaining to any of the tribes of North America, is well calculated to excite admiration. But the wonder of the Spanish conquerors at their gems and gold, the ready credulity of the missionary priests in their anxiety to magnify the gorgeous paganism which they had overthrown, and the patriotic exaggeration of later chroniclers of native descent, have all tended to overdraw the picture of the beneficent despotism of the Incas of Peru; or the crueller but not less magnificent rule of the Caciques of Mexico. With a willing credulity Spanish historians perpetuated what the Peruvian Garcilasso and the Mexican Ixtlilxochitl related, in their adaptations of native history and traditions to European conceptions. Religious, political, and social analogies to European ideas and institutions, accordingly, strike the modern student with wonder and admiration; nor has the gifted author of the *Conquests of Mexico and Peru* always sufficiently discriminated between the glowing romances begot by an alliance between the barbarous magnificence of a rude native despotism and the associated ideas of European institutions. The metallic treasures of the Incas of Peru are probably not exaggerated; and if so, the precious metals with which their palaces and temples were adorned would have been the index, in any European capital, of a wealth sufficient to employ the merchant-navies of Venice, Holland, or England in the commerce of the world. But in Peru this was the mere evidence of the abundance of the precious metals in a country where they were as little the representatives of a commercial currency as the feathers of the coraquenque, which were reserved exclusively for the decoration of royalty.

The Peruvians occupied a long extent of sea-coast, but no commercial enterprise tempted them to launch their navies on the Pacific, excepting for the most partial coasting transit. The great mass of the people patiently wrought to produce from their varied tropical climates and fertile soil the agricultural produce on which the entire community depended; resembling in this, as well as in the vast structures wrought by a patiently submissive people at the will of their absolute rulers, the great oriental despotisms when in their earliest and least licentious forms. Their own traditions traced the dawn of their government no further back than the twelfth century; and the characteristics of their imperfect and unequally developed civilisation confirm the inference that they have not in this respect departed from the invariable tendency of historic myth and tradition to exaggerate the national age. Extensive ruins still existing on the shores of Lake Titicaca are affirmed by the Peruvians to have existed before the Incas arrived. But slight importance can be attached to the traditions of an unlettered people concerning events of any kind dating four or five centuries back. The authority of Bede is of little value relative to Jute or Anglo-Saxon colonisation less than three centuries before his time; and the modern New Englander, with deeds and parchments, as well as abundance of printed history to help his tradition, cannot make up his mind as to whether the famous Newport Round Tower was built by a Norse viking of the eleventh, or a New England miller of the seventeenth century. “No account,” says Prescott, “assigns to the Inca dynasty more than thirteen princes before the Conquest. But this number is altogether too small to have spread over four hundred years, and would not carry back the

foundations of the monarchy, on any probable computation, beyond two centuries and a half—an antiquity not incredible in itself, and which, it may be remarked, does not precede by more than half a century the alleged foundation of the capital of Mexico." Humboldt, in his *Vues des Cordillères*, indicates the borders of Lake Titicaca, the district of Callao, and the high plains of Tiahuanaco, as the theatre of ancient American civilisation; and Prescott, in view of the apparently recent origin of the Incas, assumes that they were preceded in Peru by another civilised race, which, in conformity with native traditions, he would derive from this same cradle-land of South American arts. Beyond this, however, he does not attempt to penetrate into that unchronicled past. Who this people were, and whence they came, may afford a tempting theme for inquiry to the speculative ethnologist; but it is a land of darkness lying beyond the domain of history. The same mists that hang round the origin of the Incas continue to settle on their subsequent annals; and so imperfect were the records employed by the Peruvians, and so confused and contradictory their traditions, that the historian finds no firm footing on which to stand till within a century of the Spanish conquest.

In reality only a very small portion of what is called Peruvian history prior to that conquest can be regarded as anything but a historical romance; and the exaggerated conceptions relative to the completeness and consistent development alike of Peruvian and Mexican civilisation, are based on the old axiom which has so often misled the archæologist, *ex pede Herculem*.

Viewed, however, without exaggeration, the progress in mechanical skill and artistic ingenuity

attained by both of the semi-civilised American nations, is very remarkable; and seems to find its nearest analogy among the modern Chinese and Japanese. Small mirrors of polished bronze now in use in Japan exactly reproduce some of those found in the royal tombs of Peru. These tombs of the Incas, and also their royal and other depositories of treasure, have disclosed many specimens of curious and elaborate metallurgic skill: bracelets, collars, and other personal ornaments of gold, vases of the same abundant precious metal, and also of silver; mirrors of burnished silver and bronze, as well as of obsidian; polished masks, rings, and cups of the same intractable material; finely adjusted balances made in silver; bells both of silver and bronze; and numerous commoner articles of copper, or of the more useful alloy of copper and tin, of which their tools were chiefly made.

But while the arts of civilisation were being fostered on those southern plateaux of the Andes, another seat of native American civilisation had been founded on the corresponding plateaux of the northern continent, and the Aztecs were building up an empire even more marvellous than that of the Incas. The site of the latter is among the most remarkable of all the scenes consecrated to such memories. On the lofty table-land which lies between the Gulf of Mexico and the Pacific Ocean, at an elevation of nearly seven thousand five hundred feet, the valley of Mexico lies engirdled by its ramparts of porphyritic rock, like a vast fortress provided by nature for guarding the infancy of American civilisation. Here was the scene of the heroic age of Toltec Art, where the foundations of all later progress were laid, and architecture achieved its earliest triumphs in the New World on the temples

and towers of Tula, the ruined remains of which attracted the attention of the Spaniards at the time of the Conquest. But the history of the Toltecs and their ruined edifices stands on the border lines of romance and fable, like that of the Druid builders of Carnac and Avebury. To them, according to tradition and such historical evidence as is accessible, succeeded their Aztec or Mexican supplanters, along with the Acolhuans, or Tezcucans, as they were latterly called from their capital Tezcuco. Mr. Edward B. Tylor describes an ancient arch which still stands there. It is a skew-bridge of twenty feet span, built with slabs of stone set on edge in the form of a roof resting on two buttresses; and is an ingenious approximation to the true arch.[82] On the opposite shores of the same Mexican lake, the largest of five inland waters that diversified the surface of that great table-land valley, stood Tezcuco and Mexico, the capitals of the two most important states within which the native civilisation of the North American continent developed itself. From the older Toltecans, the encroaching Tezcucans are believed to have derived the germs of that progress, which is best known to us in connection with the true Aztec or Mexican state. Legends of the golden age and heroic races of Anahuac abound, and have been rendered into their least extravagant forms by the patriotic zeal of Ixtlilxochitl, a lineal descendant of the royal line of Tezcuco. But the true Mexicans are acknowledged to be of recent origin, and the founding of Mexico is assigned to A.D. 1326. Among the special evidences of their civilisation is their calendar. By the unaided results of native science the dwellers on the Mexican plateau had effected an adjustment of civil to solar time, so nearly correct that when the Spaniards landed on their coast, their own reckoning, according

to the unreformed Julian calendar, was nearly eleven days in error, compared with that of the barbarian nation whose civilisation they so speedily effaced. But the difference thus noted represented in the European calendar the accumulated error of upwards of sixteen centuries; so that the approximation of Mexican computation to true solar time is probably only a proof of the recent adjustment of their calendar; and so confirms the probability of the founding of the Mexican capital within two centuries of its overthrow. But the founders of Tenochtitlan, as the new capital was called, were a vigorous, enterprising, and ferocious race. The later name of Mexico was derived from the Aztec war-god Mexitli, whose favours to his votaries enabled them to form a powerful state by conquest, to enrich themselves with spoil, and to replace the rude structures of their city's founders with substantial and ornate buildings of stone.

Whatever gloze of mild paternal absolutism may linger around our conceptions of the prehistoric chronicles of Peru, a clearer light illuminates the harsh realities of Mexican sovereignty. The god of war was the supreme deity of the Aztecs, worshipped with hideous rites of blood. Their civil and military codes, according to the narrative of their conquerors, were alike cruel as that of Draco; and their religious worship was a system of austere fanaticism and loathsome butchery, which seemed to refine the cruelties of the Red Indian savage into a ritual service fit only for the devil. But besides their hideous war-god, the Mexican mythology was graced by a beneficent divinity, named Quetzalcoatl, the instructor of the Aztecs in the use of metals, in agriculture, and in the arts of government. This and similar elements of Mexican mythology have been

regarded as traces of a milder faith inherited from their Toltecan predecessors. The idea is one supported by many probabilities, as well as by some evidence. The early history of the Northmen, however, in which we witness the blending of a rich poetic fancy, wherein lay the germ of later Norman romance and chivalry, with cruelties pertaining to a creed little less bloody than that of the Mexican warrior, shows that no such theory is needed to account for the incongruities of the religious system of the Aztecs. In truth, the ferocity of a semi-barbarous people is often nothing more than its perverted excess of energy; and, as has been already noted in reference to the Caribs, is more easily dealt with, and turned into healthful and beneficent action, than the cowardly craft of the slave. It is only when such hideous rites are consciously engrafted on the usages of a people already far in advance of such a semi-barbarous childhood, as in the adoption of the Inquisition by Spain at the commencement of its modern history, that they prove utterly baneful; because the nation is already past that stage of progress in which it can naturally outgrow them.

Hideous, therefore, as were the human sacrifices, with their annual thousands of victims; the offerings of infants to propitiate Tlaloc, their rain-god; and the loathsome banquets on the bodies of their sacrificed victims:—if indeed this be not an exaggeration of Spanish credulity and fanaticism;—it is nevertheless difficult to concur in the verdict of the gifted historian of *The Conquest of Mexico*, that “it was beneficently ordered by Providence that the land should be delivered over to another race who would rescue it from the brutish superstitions that daily extended wider and wider, with extent of empire.” The rule of the conquerors, with their Dominican

ministers of religion, was no beneficent sway; and its fruits in later times have not proved of such value as to reconcile the student of that strange old native civilisation of the votaries of Quetzalcoatl, to its abrupt arrestment, at a stage which can only be paralleled by the earlier centuries of Egyptian progress.

Metallurgic arts were carried in some respects further by the Mexicans than by the Peruvians. Silver, lead, and tin were obtained from the mines of Tasco and Pachuca; copper was wrought in the mountains of Zacotollan, by means of galleries and shafts opened with persevering toil where the metallic veins were imbedded in the solid rock; and there, as at the Lake Superior copper regions, the traces of such ancient mining have proved the best guides to modern searchers for the ores. The arts of casting, engraving, chasing, and carving in metal, were all practised with great skill. Vessels both of gold and silver were wrought of enormous size: so large, it is said, that a man could not encircle them with his arms; and the abundant gold was as lavishly employed in Mexico as in Peru, in the gorgeous adornment of temples and palaces. Ingenious toys, birds and beasts with moveable wings and limbs, fish with alternate scales of silver and gold, and personal ornaments in great variety, were wrought by the Mexican goldsmiths of the precious metals, with such curious art, that the Spaniards acknowledged the superiority of the native workmanship over anything they could achieve. When Cortes first entered the capital of Montezuma in 1513, the Mexican ruler received him in the palace built by his father Axayacatl, and hung round his neck a decoration of the finest native workmanship. The shell of a species of craw-fish, set in gold, formed the centre, and

massive links of gold completed the collar, from which depended eight ornaments of the same metal, delicately-wrought in imitation of the prized shell-fish.

The arts thus practised on the great plateau extended to the most southern limits of the North American continent. The ancient graves of the Isthmus of Panama have been ransacked by thousands in recent years, from the temptation which the gold relics they contain hold out to their explorers. Those include representations of beasts, birds, and fishes, frogs, and other objects, imitated from nature, often with great skill and ingenuity. One gold frog which I examined had the eyes hollow, with an oval slit in front, and within each a detached ball of gold, which appeared to have been executed in a single casting. This insertion of detached balls is frequently met with in the pottery, as well as in the goldsmith's work of the Isthmus, and is singularly characteristic of a peculiar phase of local art. Human figures, and monstrous or grotesque hybrids wrought in gold, with the head of the cayman, the eagle, and other animals, attached to the human form, are also found in the same graves; but, so far as my own opportunities of observation enable me to judge, the human figure generally exhibits inferior imitative skill and execution to the representations of other animate subjects. But all alike display abundant metallurgic art. Soldering as well as casting was known to the ancient goldsmith, and the finer specimens have been finished with the hammer and graving-tool. Judging from the condition of the human remains found in those huacas of the peninsula, they are probably of a much higher antiquity than the era of Mexican civilisation; and lying as they do in the narrow isthmus between the

twin continents, they suggest the probability of a common source for the origin of Peruvian and Aztec arts.

But while the Mexicans wrought their ingenious toys, lavished their inexhaustible resources of gold and silver in personal decoration, and adorned their public edifices with scarcely less boundless profusion than the Peruvians, they had learned to some extent the practical value of gold and other metals as a convenient currency. By means of this equivalent for the gold and silver coinage of Europe, the interchange of commodities in the great markets of Mexico was facilitated, and an important step in the progress towards a higher stage of civilisation secured. This metallic currency consisted of pieces of tin cut in the form of a **T** or stamped with a similar character, and of transparent quills filled with gold dust. These were apparently regulated to a common standard by their size: for the use of scales and weights, with which the Peruvians were familiar, appears to have been unknown in Mexico.

The nature of the Mexican currency accords with the knowledge and experience of a people among whom metallurgic arts were of comparatively recent origin. The easily fused tin, and the attractive and accessible gold-dust, supplied ready materials for schooling the ingenious metallurgist in the use of the metals. Copper was probably first employed when found in a pure metallic state, as among the old miners of Lake Superior; while the art of fusing, taught by the Aztec Tubal-Cain, was tried only on the readily-yielding tin. By this means the arts of smelting and moulding the ores would be acquired, and applied to copper, silver, and gold, as well as to tin. Accident might suggest the next important stage, that of metallic alloys; but under the circumstances

alike of Peruvian and Mexican civilisation, progressing in regions abounding with the most attractive and easily-wrought metals, it is not difficult to conceive of the independent discovery of the useful bronze alloy. Yet by the standard composition of their bronze, far more than by the ingenious intricacy of their personal ornaments, utensils, and architectural decorations, the actual progress of the Incas or of the Aztecs may fairly be tested. The delight of the savage in personal adornment precedes even the needful covering of his nakedness, and the same propensity long monopolises the whole inventive ingenuity of a semi-barbarous people; while the useful bronze tools embody the true germs of incipient civilisation. Tested by such a standard, the metallurgic arts of Peru furnish evidence of very partial development.

The alloy of copper and tin, when destined for practical use in manufacture, is found to possess the most serviceable qualities when composed of about ninety per cent. of copper to ten of tin; and so near is the approximation to this theoretical standard among the bronze relics of the ancient world, that the archæologists of Europe have been divided in opinion as to whether they should assume a Phœnician or other common origin for the weapons, implements, and personal ornaments of that metal found over the whole continent; or that the mixed metal, derived from a common centre, was manufactured in various countries of Europe into the objects of diverse form and pattern abounding in their soil, or deposited among their sepulchral offerings.

But the approximation to a uniform alloy is no more than would inevitably result from the experience of the extreme brittleness resulting from

any undue excess of the tin. Accident, or the natural proximity of the metals or ores, as they occur in the mineral regions of England, may have furnished the first disclosure of the important secret. But that once discovered, the subsequent steps were inevitable. Having ascertained that he could produce a harder and more useful compound than the pure copper by alloying it with tin, the native metallurgist would not fail to vary the proportions of the latter till he had obtained a sufficiently near approximation to the best bronze, to answer the purposes for which it was designed. No interchange of experience was necessary to lead the metallurgists of remote regions to similar results; nor would a closer correspondence between the proportionate ingredients of the native American and European bronze than has yet been detected, indicate more than common aims, and the inevitable experience, consequent on the properties of the varying alloy, leading to corresponding results.

The following table of analyses of ancient European bronze relics will suffice to show how little foundation there is for the assumption of any common origin for the alloy of which they were made; and the corresponding evidence of proportionate ingredients disclosed by analyses of native American bronzes, disproves the theory of any European or other foreign source for the metallurgic arts of the New World.

ANALYSES OF ANCIENT BRONZES.

No.			Copper.	Tin.	Lead.
1.	Caldron,	Berwickshire,	92·89	5·15	1·78
2.	Sword,	Duddingston,	88·51	9·30	2·30
3.	Kettle,	Berwickshire	88·22	5·63	5·88
4.	Axe-head,	Mid-Lothian,	88·05	11·12	0·78

5.	Caldron,	Duddingston,	84·08	7·19	8·53
6.	Palstave,	Fifeshire,	81·19	18·31	0·75
7.	Vessel,	Ireland,	88·00	12·00	
8.	Wedge,	”	94·00	5·09	
9.	Sword,	”	88·63	8·54	2·83
10.	Sword,	”	83·50	5·15	8·35
11.	Lituus,	Lincolnshire,	88·00	12·00	
12.	Roman patella,	”	86·00	14·00	
13.	Spear-head,	”	86·00	14·00	
14.	Scabbard,	”	90·00	10·00	
15.	Axe palstave,	Cumberland,	91·00	9·00	
16.	Axe-head,	”	88·00	12·00	
17.	Vessel,	Cambridgeshire,	88·00	12·00	
18.	Axe-head,	Ireland,	91·00	9·00	
19.	Sword,	Thames,	89·69	9·58	
20.	Sword,	Ireland,	85·62	10·02	
21.	Celt,	”	90·68	7·43	1·28
22.	Axe-head,	”	90·18	9·81	
23.	Axe-head,	”	89·33	9·19	
24.	Celt,	”	83·61	10·79	3·20
25.	Celt,	King’s Co., Ireland,	85·23	13·11	1·14
26.	Drinking-horn,	” ”	79·34	10·87	9·11
27.	Celt,	Co. Cavan, ”	86·98	12·57	
28.	Celt,	”	98·74	1·09	
29.	Celt,	Co. Wicklow, ”	88·30	10·92	0·10
30.	Celt, Co.	Cavan, ”	95·64	4·56	0·25
31.	Spear-head,	”	86·28	12·74	0·07
32.	Spear-head,	”	84·64	14·01	
33.	Scythe,	Roscommon, ”	95·85	2·78	0·12
34.	Sword-handle,	”	87·07	8·52	3·37
35.	Sword,	”	87·94	11·35	0·28
36.	Dagger,	”	90·72	8·25	0·87
37.	Chisel,	”	91·03	8·39	
38.	Caldron,	”	88·71	9·46	1·66
39.	Sword,	France,	87·47	12·53	
40.	Spear-head,	Northumberland,	91·12	7·97	0·77

Nos. 1-6. Dr. George Wilson.

7-8. Dr. J. H. Gibbon, U.S. Mint.
9-10. Professor Davy.
11-18. Dr. Pearson, *Philosoph. Trans.* 1796.
19-24. J. A. Philips, *Mém. Chem. Soc.*, iv. p. 288.
25, 26. Dr. Donovan, *Chem. Gazette*, 1850, p. 176.
27-38. Mr. J. W. Mallet, *Transactions R. I. A.* vol. xxii. p. 325.
39. Mongez, *Mém. de l'Institut*.
40. Dr. E. Macadam, *Proceed. S. A. Scot.* viii. 300.

In No. 31 is also Cobalt, ·09; in No. 37, Antimony, ·04; and in No. 41, Arsenic, ·03.

From the varied results which so many analyses disclose, ranging as they do from 79 to 98 per cent. of copper; as well as from the diversity of the ingredients: it is abundantly obvious that no greater uniformity is traceable, than might be expected to result from the operations of isolated metallurgists, very partially acquainted with the chemical properties of the standard alloy, and guided for the most part by the experience derived from successive results of their manufacture. It is thus apparent that the various exigencies of the metallurgist, under the control of a very ordinary amount of practical skill, would lead to the determination of the best proportions for this useful alloy; though it would only be after the accumulated fruits of isolated experiment had been combined, that anything more than some crude approximation to the best composition of bronze would be determined. Hence the value of analytical evidence in determining the degree of civilisation of Mexico and Peru, as indicated by their metallurgic arts. For the general requirements of a tool, or weapon of war, where a sufficient hardness must be obtained without any great liability to fracture, the best proportions proved to be about 90 per cent. of copper to 10 of tin; or with a small proportion of lead in lieu of part of the tin: which, as further experience taught the primitive worker in bronze, communicates to the cutting instrument a greater degree of toughness, and consequently diminishes its liability to fracture. But where great hardness is the chief requisite, as in certain engraving, carving, and gem-cutting tools, the mere increase of tin in the alloy supplies the

requisite quality: until the excessive brittleness of the product gives warning that the true limit has been exceeded. In this, I doubt not, lies the whole secret of Mexican and Peruvian metallurgy, which has seemed so mysterious, and therefore so marvellous to the most sagacious inquirers.

The following table furnishes the results of analyses of various ancient American bronzes. Few as the examples are, they afford definite illustration of the subject under review, and supply some means of comparison with the data already furnished relative to the ancient bronzes of Europe.

ANALYSES OF ANCIENT AMERICAN BRONZES.

No.		Copper.	Tin.	Iron.
1.	Chisel from silver mines, Cuzco,	94·	6·	
2.	Chisel from Cuzco,	92·385	7·615	
3.	Knife from grave, Atacama,	97·87	2·13	
4.	Knife " "	96·	4·	
5.	Crowbar from Chili,	92·385	7·615	
6.	Knife from Amaro,	95·664	3·965	0·371
7.	Perforated axe,	96·	4·	
8.	Personal ornament, Truigilla,	95·440	4·560	
9.	Bodkin from female grave, do.,	96·70	3·30	

Nos. 1. Humboldt.
2. Dr. J. H. Gibbon.
3, 4. J. H. Blake, Esq.
5. Dr. T. C. Jackson.
6, 7. Dr. H. Croft.
8, 9. T. Ewbank, Esq.

The comparison of this with the previous table

indicates a smaller amount of tin in the American bronze than in that of ancient Europe. For some Egyptian spear-heads Gmelin gives, copper 77·60, tin 22·02; and the composition of ancient weapons, armour, vessels, and coins, seems to indicate such a systematic variation of proportions as implies the result of experience in adapting the alloy for the specific purpose in view. A much larger number of analyses would be desirable as data from which to generalise on the metallurgic skill developed independently by native American civilisation; but the examples adduced seem to show that there is no lost secret for Europe to discover.

The native metallurgist had learned the art of alloying his ductile copper with the still softer tin, and producing by their chemical admixture a harder, tougher metal than either. But he does not appear to have carried his observation so far as to ascertain the most efficient proportions of the combining metals; or even to have made any very definite approximation to a fixed rule, further than to use with great moderation the alloying tin. He had discovered, but not entirely mastered, a wonderful secret, such as in the ancient world had proved to lie at the threshold of all higher truths in mechanical arts. He was undoubtedly advancing, slowly but surely, on the direct course of national elevation; and the centuries which have followed since the conquests of Cortes and Pizarro might have witnessed in the New World triumphs not less marvellous in the progress of civilisation than those which distinguish the England of Victoria from that of the first Tudor. But native science and art were abruptly arrested in their progress by the Spanish conquistadors; and it is difficult to realise the conviction that either Mexico or Peru has gained any

adequate equivalent for the loss which thus debars us from the solution of some of the most interesting problems connected with the progress of the human race. Amid all the exclusiveness of China, and the isolation of Japan, there is still an unknown quantity among the elements of their civilisation derived from the same sources as our own. But the America of the fifteenth and sixteenth centuries was literally another world, securely guarded from external influences. Nevertheless while all appears to have been self-originated, we meet everywhere with affinities to the arts of man elsewhere, and trace out the processes by which he has been guided, from the first promptings of a rational instinct to the intelligent development of many later steps of reason and experience.

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[78] *Méms. Chemical Society*, vol. iv. p. 288.

[79] *Edinburgh Philosophical Journal*, vol. vi. p. 357.

[80] *Prehistoric Annals of Scotland* (2d ed.), vol. i. p. 319.

[81] *Proceedings*, *B. N. H. S.*, vol. v., p. 63.

[82] Anahuac, p. 153.

CHAPTER X.

THE MOUND-BUILDERS.

EARTH-PYRAMIDS—MONUMENTS OF THE MOUND-BUILDERS—SEATS OF ANCIENT POPULATION—DIFFERENT CLASSES OF WORKS—ANCIENT STRONGHOLDS—NATURAL SITES—FORT HILL, OHIO—IROQUOIS STRONGHOLDS—ANALOGOUS STRONGHOLDS—FORTIFIED CIVIC SITES—SACRED ENCLOSURES—NEWARK EAGLE MOUND—GEOMETRICAL EARTHWORKS—PLAN OF NEWARK EARTHWORKS, OHIO—A STANDARD OF MEASUREMENT—DIVERSITY OF WORKS—THE CINCINNATI TABLET—A GEOMETRICAL INSTRUMENT—TRACES OF EXTINCT ARTS.

The progress hitherto noted has related chiefly to the tools of the workman. In Mexico, and still more in Central America and Peru, those were applied both to sculpture and architecture on a grand scale. But some of the most singular memorials of the primitive architecture of the New World survive in the form of gigantic earthworks, perpetuating in their construction remarkable evidence of geometrical skill.

Along the broad levels drained by the Mississippi and its numerous tributaries traces of America's allophylian population abound; and the Ohio valley is pre-eminently remarkable for the number and magnitude of such works. The Ohio and its tributary streams flow through a fine undulating, fertile country, which now forms one of the great centres of population; and the evidence of modern enterprise and skill which abounds there gives additional interest to traces which disclose to us proof that this vast area is not now rescued for the first time from the primeval forest, with its wild fauna, and still wilder savage man.

In a region such as this, attracting population to the broad alluvial terraces overlooking its smoothly-flowiug rivers, it was natural that the building instinct of man should first employ itself on earthworks; and that the monuments should assume a pyramidal form. The great mound of Miamisburg,

Ohio, is sixty-eight feet high, and eight hundred and fifty-two feet in circumference at its base. The more famous Grave Creek Mound of Virginia rises to a height of seventy feet, and measures at its base one thousand feet in circumference. Other and still larger earthworks have been noted, such as the truncated pyramid at Cahokia, Illinois, which, while it remained intact, occupied an area upwards of two thousand feet in circumference, and reared its level summit, of several acres in extent, to a height of ninety feet. But this last belongs to a different class from the sepulchral mounds which appear to be unsurpassed by any known works of their kind. “We have seen mounds,” remarks Flint, an American topographer, with a just appreciation of the relation of these earthworks to the features of the surrounding landscape, “which would require the labour of a thousand men employed on our canals, with all their mechanical aids, and the improved implements of their labour, for months. We have more than once hesitated in view of one of those prodigious mounds, whether it were not really a natural hill. But they are uniformly so placed, in reference to the adjacent country, and their conformation is so unique and similar, that no eye hesitates long in referring them to the class of artificial erections.” The exploration of these huge earth pyramids has set at rest any doubts as to their artificial origin; and has, moreover, established the fact that they are structures erected to perpetuate the memory of the honoured dead in ages utterly forgotten, and by a race of which they preserve almost the sole remaining vestiges.

The works of the Mound-Builders extend over a wide area, and include many other structures besides those of a sepulchral character. The people by whom

they were executed must have been in a condition very different from the forest tribes of the seventeenth and eighteenth centuries. Nevertheless, though congregated at many favourite points in large communities, they may have been isolated by extensive tracts of forest from the regions beyond the river-systems on which they were settled. The country lying remote from the larger tributaries of the Mississippi was probably in the era of the Mound-Builders, as in later times, covered with forest; while perchance on outlying regions, or beyond the great Lakes and the Rocky Mountains, the progenitors of modern Indian tribes lurked: like the barbarians of ante-Christian Europe, beyond the Rhine and the Baltic.

The fertile valley of the Scioto appears to have been one of the seats of densest population, as indicated by the numerous works which diversify its surface. Corresponding evidence preserves the traces of an equally numerous population in the Miami Valley; and the mounds and earthworks of various kinds throughout the state of Ohio are estimated at between eleven and twelve thousand. They are stated to be scarcely less numerous on the Kenhawas in Virginia than on the Scioto and Miamis, and are abundant on the White River and Wabash, as also upon the Kentucky, Cumberland, Tennessee, and numerous other tributaries of the Ohio and Mississippi. Works accumulated in such numbers, and, including many of great magnitude and elaborateness of design, executed by the combined labour of large bodies of workmen, afford indisputable evidence of a settled and industrious population. Beyond those carefully explored regions, traces of other ancient structures have been observed at widely separated points; though caution must be

exercised in generalising from data furnished by casual and inexperienced observers. All primitive earthworks, whether for defence, sepulchral memorials, or religious rites, have certain features in common; and the tendency of the popular mind is rather to exaggerate chance resemblances into forced analogies and parallels, than to exercise any critical discrimination. Including, however, all large earthworks essentially dissimilar from the slight structures of the modern Indian, they appear to stretch from the upper waters of the Ohio to the westward of Lake Erie, and thence along Lake Michigan, nearly to the Copper Regions of Lake Superior. Examples of a like character have been traced through Wisconsin, Iowa, and the Nebraska Territory; while in the south their area is bounded by the shores of the Gulf of Florida and the Mexican territory, where they seem gradually to lose their distinctive character, and pass into the great teocallis of a higher developed Mexican architecture. Their affinities are indeed more southern than northern. They are scarcely, if at all, to be found to the eastward of the water-shed between the Mississippi and the Atlantic, in the States of Pennsylvania, New York, or Virginia; and they have been rightly designated, from their chief site, the Ancient Monuments of the Mississippi Valley, including those of its tributaries, and especially of the valley of the Ohio. There their localities fully accord with those which, in the primitive history of the Old World, reveal the most abundant traces of an aboriginal population, in their occupation of the broad alluvial terraces, or “river bottoms,” as they are styled. To the north the memorials of an ancient population are of a different character; and the earthworks in the vicinity of the Great Lakes must be classed by

themselves, as indicating distinct customs and rites.

The remarkable works thus traceable over so large an extent of the North American continent admit of being primarily arranged into the two subdivisions of Enclosures and Mounds, and those again embrace a variety of works evidently designed for very different uses. Under the first of these heads are included the fortifications or strongholds; the sacred enclosures, destined, as is assumed, for religious rites; and numerous miscellaneous works of the same class, generally symmetrical in structure, but the probable use of which it is difficult to determine. The second subdivision embraces the true mound-buildings, including what have been specially designated sacrificial, sepulchral, temple, and animal-mounds. All partake of characteristics pertaining to a broad level country; but this is nowhere so strikingly apparent as where mounds seem to have been purposely erected as observatories or points of sight from whence to survey the works elaborated on a gigantic scale on the level plain. In addition to the striking features which their external aspect exhibits: wherever they have been excavated interesting relics of the ancient builders have been disclosed, adding many graphic illustrations of their social condition, and of the artistic and industrial arts of the period to which they pertain.

The British hill-forts, the remarkable vitrified forts of Scotland, and the larger strongholds of the British aborigines, such as the ingenious circumvallations of the White Caterthun overlooking the valley of Strathmore, all derive their peculiar character from the mountainous features of the country; while on the low ground, under the shadow of the Ochils, the elaborate earthworks of the Camp of Ardoch show the strikingly contrasting

castrametation of the Roman invaders. The ancient raths of Ireland, which abound in the level districts of that country, as well as on heights where stone is not readily accessible, also furnish highly interesting illustrations of earthworks with a special character derived from the features of their localities. An earthen *dune* or *rath*, as in the celebrated Rath Keltair at Downpatrick, occupies a commanding site, where it is strongly entrenched, with a considerable space of ground enclosed within its outworks. The celebrated Hill of Tara, in the county of Meath, ceased, according to tradition, to be the chief seat of the Irish kings, since its desertion in the latter part of the sixth century, shortly after the death of Dermot, the son of Fergus. It appears to have been a fortified city; and now, after the devastations of thirteen centuries, its dunes, circumvallations and trenches, present many interesting points of comparison with the more extensive earthworks of the Mississippi valley. But neither the Scottish White Caterthun, nor the Irish Bath Keltair, or even the Rath Righ of Tara Hill, can compare with the remarkable American stronghold of Fort Hill, Ohio, or Fort Ancient on the Little Miami River, in the same State.

The valley of the Mississippi is a vast sedimentary basin extending from the Alleghanies to the Rocky Mountains. Through this the great river and its numerous tributaries have made their way for countless ages, working out shallow depressions in the plain, on which are recorded successive epochs of change in the terraces that mark the deserted levels of ancient channels. The edges of these table-lands bordering on the valleys are indented by numerous ravines; and the junctions of many lesser streams with the rivers have formed nearly detached peninsulas, or in some cases tracts of considerable

elevation insulated from the original table-land. Many of those bluff headlands, peninsulas, and isolated hills presented all the requisite adaptations for native strongholds. They have, accordingly, been fortified with great labour and skill. Embankments and ditches enclose the whole space, varying in strength according to the natural resources of the ground. The approaches are guarded by trenches and overlapping walls, more or less numerous in different forts; and have occasionally a mound alongside of the other defences of the approach, but rising above the rest of the works, as if designed both for out-look and additional defence. In some few cases the walls of these enclosures are of stone, but if they were ever characterised by any attempt at regular masonry all traces of it have disappeared, and there seems little reason for supposing that such walls differed in essential character from the earthworks. No cement was used, and in all probability we have in them only the substitution of stone-heaps instead of earth-banks, owing to special local facilities.

One of the simplest, but most extensive of those primitive strongholds, is Fort Hill, Ohio. The defences occupy the summit of a height, elevated about five hundred feet above the bed of Bush Creek, which flows round two sides of the hill, close to their precipitous slope. Along the edge of this hill a deep ditch has been cut, and the materials taken from it have been piled up into an embankment, rising from six to fifteen feet above the bottom of the ditch. In its whole extent the wall measures eight thousand two hundred and twenty-four feet, or upwards of a mile and a half in length; and encloses an area of forty-eight acres, now covered with gigantic forest-trees. One of them, a chestnut, measured twenty-one feet, and an oak, though greatly decayed, twenty-three

feet in circumference, while the trunks of immense trees lay around in every stage of decay. Such was the aspect of Fort Hill, Ohio, a few years ago, and it is probably in no way changed now. Dr. Hildreth counted eight hundred rings of annual growth in a tree which grew on one of the mounds at Marietta, Ohio; and Messrs. Squier and Davis, from the age and condition of the forest, ascribed an antiquity to its deserted site of considerably more than a thousand years. In their present condition, therefore, the walls of “Fort Hill” are ruins of an older date than the most venerable stronghold of the Normans of England; and we see as little of their original completeness, as in the crumbling Norman keep we are able to trace all the complex system of bastions, curtains, baileys, buttress-towers, and posterns, of the military architecture of the twelfth century. Openings occur in the walls, in some places on the steepest points of the hill, where access is impossible; and where, therefore, we must rather suppose that platforms may have been projected to defend more accessible points. The ditch has in many places been cut through sandstone rock as well as soil; and at one point the rock is quarried out so as to leave a mural front about twenty feet high. Large ponds or artificial reservoirs for water have been made within the enclosure; and at the southern point, where the natural area of this stronghold contracts into a narrow and nearly insulated projection terminating in a bold bluff, it rises to a height of thirty feet above the bottom of the ditch, and has its own special reservoirs, as if here were the keep and citadel of the fortress: doubtless originally strengthened with palisades and military works, of which every trace had disappeared before the ancient forest asserted its claim to the deserted fortalice. Here then, it is

obvious we look on no temporary retreat of some nomadic horde, but on a military work of great magnitude; which, even with all the appliances of modern engineering skill, would involve the protracted operations of a numerous body of labourers, and when completed must have required a no less numerous garrison for its defence. The contrast is very striking between such elaborate works and the most extensive of those still traceable in Western New York the origin of which appears to be correctly assigned to Iroquois and other tribes known to have been in occupation of their sites in comparatively recent times.

Among the native Indian tribes who have come under direct observation of Europeans, none played a more prominent part than the Iroquois. At the period of Dutch discovery in the beginning of the seventeenth century, they occupied the territory between the Hudson and the Genesee rivers, of which they continued to maintain possession for nearly two centuries, in defiance of warlike native foes, and the more formidable aggression of the French invaders. Their numbers, at the period of their greatest prosperity, about the middle of the seventeenth century, have been variously estimated from 70,000, which La Hontan assigned to them, to the more probable estimate of 25,000 given by the historian of their League. Very exaggerated pictures have been drawn by some modern writers of the Iroquois confederacy. It was a union of tribes of savage hunters, among whom only the germs of incipient civilisation are traceable. They had indeed acquired settled habits, and devoted themselves to some extent to agriculture. But with all the matured arts resulting from combined action in the maintenance of their territory for successive

generations against fierce hostile tribes, and the defence of an extensive frontier constantly exposed to invasion, the traces of the Iroquois strongholds are of so slight a description that many of them have already been obliterated by the plough.

From the facts thus presented to our consideration, it is obvious that the highest estimate we can entertain of the powers of combination indicated by the famous League of the Iroquois, furnishes no evidence of a capacity for the construction and maintenance of works akin to the strongholds of the Mound-Builders in the Ohio valley. Striking as is the contrast which the Iroquois present to more ephemeral savage tribes, the remains of their earthworks present in some respects a greater contrast to those of the Mound-Builders than the latter do to the elaborate architecture of Mexico and Yucatan. There are indeed points of resemblance between the strongholds of the two, as there are between them and the British hill-forts, or any other earthworks erected on similar sites; but beyond such general elements of comparison,—equally interesting, but as little indicative of any community of origin as the correspondence traceable between the flint and stone weapons in use by the builders of both,—there is nothing in such resemblances calculated to throw any light on the origin of those remarkable monuments of the New World. It is rather from the contrast between the two that we may turn the remains of Iroquois defences to account, as suggestive of a greatly more advanced condition of social life and the arts of a settled population among the Mound-Builders of the Mississippi and its tributaries.

Further proofs of the settled character of this ancient population are furnished by another class of

defensive works, supposed to mark the sites of fortified towns. One of these, called “Clark’s Work,” on the north fork of Point Creek, in the Scioto valley, embraces an area of one hundred and twenty-seven acres; and encloses within its circumvallations sacrificial mounds, and symmetrical earthworks assumed with every probability to have been designed for religious or civic purposes. A stream has been turned into an entirely new channel, in order to admit of the completed circuit of the walls. “The embankments measure together nearly three miles in length; and a careful computation shows that, including mounds, not less than three million cubic feet of earth were used in their composition.”[83] Within the enclosures thus laboriously executed, many of the most interesting relics of ancient art have been dug up, including several coiled serpents of carved stone, carefully enveloped in sheet mica and copper; pottery, fragments of carved ivory, discoidal stones, and numerous fine sculptures.

It is obvious that the population capable of furnishing the requisite labour for works of so extensive a nature must have been numerous, and its resources for the maintenance of such a phalanx of workers proportionally abundant. The garrisons of the great strongholds, and the population that found shelter within such mural defences as “Clark’s Work,” must also have been very large, requiring for their subsistence the contributions of an extensive district. But this only accords with other proofs of the condition of the Mound-Builders as a settled people. When we turn from the consideration of single large fortifications crowning the insulated heights, and estimate the number and extent of mounds, symmetrical enclosures, and works of various kinds connected with the arts of peace and

the rites of religious worship, which give so striking a character to the river-valleys and terraces, it is no longer possible to doubt that many sections of this fertile region were once before filled by an industrious, settled population.

The Sacred Enclosures have been separated from the military works of the Mound-Builders on very obvious grounds. Their elaborate fortifications occupy isolated heights specially adapted for defence; whereas the broad river-terraces have been selected for their religious works. There, on the great unbroken levels, they form groups of symmetrical enclosures, square, circular, elliptical, and octagonal, with long connecting avenues, suggesting comparisons with the British Avebury, or the Hebridean Callernish; with the Breton Carnac; or even with the temples and Sphinx-avenues of the Egyptian Karnak and Luxor.

The predominant impression suggested by the great military earthworks of the Mound-Builders is that of the action of a numerous population, co-operating under the guidance and authority of approved leaders, with a view to the defence of large communities. Elaborate fortifications such as that of "Clark's Work" in the Scioto Valley, or "Fort Ancient" on the Little Miami River, are constructed on well-chosen hills or bluffs, and strengthened by ditches, mounds, and complicated approaches; but the lines of earthwork, like those of the great Scottish hill-forts, are everywhere adapted to the natural features of the site. With the sacred enclosures it is wholly different. Some of these also do, indeed, impress the mind with the imposing scale of their embankments. On first entering the great circle at Newark, and looking across its broad trench at the lofty embankment overshadowed with full-grown forest-

trees, my thoughts reverted to the Antonine vallum, which by like evidence still records the presence of the Roman masters of the world in North Britain. But after driving over a circuit of several miles embracing the remarkable group of earthworks of which this is only a single feature, and satisfying myself by personal observation of the existence of parallel avenues which have been traced for nearly two miles; and of the grand central oval, circle, and octagon, the smallest of which measures upwards of half-a-mile in circumference: all idea of mere combined labour is lost in the higher conviction of manifest skill, and even science. The angles of the octagon are not coincident, but the sides are very nearly equal; and the enclosure approaches so closely to a perfect figure that its error is only demonstrated by actual survey. Connected with it by parallel embankments 350 feet long, is a true circle, measuring 2880 feet in circumference; and distant nearly a mile from this, but connected with it by an elaborate series of earthworks, is the circular structure above referred to. Its actual form is an ellipse, the respective diameters of which are 1250 feet, and 1150 feet, respectively; and it encloses an area of upwards of 30 acres.

At the entrance of this great circle the enclosing embankment curves outward on either side for a distance of 100 feet, leaving a level way between the ditches, 80 feet wide. The earthen mound, which is here higher than at any other point, measures about 30 feet from the bottom of the ditch to the summit. The area of the enclosure is so nearly a perfect level that Mr. J. M. Dennis, to whose intimate local knowledge I was indebted for a thorough survey of the works, informed me that he had observed during the rains of the previous spring the water stood at a

uniform level nearly to the edge of the ditch. In the centre of this enclosure is an earthen mound, still called “The Eagle.” Mr. Squier says of it: “It much resembles some of the animal-shaped mounds of Wisconsin, and was probably designed to represent a bird with expanded wings.” It has been opened and found to contain a hearth, or “altar.” The fact is important; as it distinguishes it in this respect essentially from the emblematic mounds of Wisconsin, and tends to confirm the idea that the great circle and its related groups of earthworks all bore some reference to sacred games, or other strange rites of religion, once practised within their circumvallations. But successive excavations have greatly marred the original contour of the mound; and now that, with a view to the preservation of the principla earthwork, it has been secured as the Licking County fair ground, the erection of a grand stand on the summit of the Eagle Mound has contributed still further to obscure the traces of its primary form.

From the elliptical enclosure a wide avenue of two dissimilar parts, seemingly constructed without relation to each other, leads to a square of twenty acres, with seven mounds disposed symmetrically within the enclosing walls, and numerous other works occupy hundreds of acres with their geometrical configurations. But in spite of the intelligent interest which prevails in reference to those remarkable monuments of an ancient people, the industrial operations of the modern occupants of their sites are fast obliterating all but the most prominent works. In the great octagon I noticed a difference of nearly five feet between the height of the embankments still standing on uncleared land, and those portions which have been long under the

plough. But for the aid of my intelligent guide I should have found it impossible to trace out the indications of the parallel ways; and already many of the smaller mounds and enclosures have entirely disappeared. Roads, railways, and a canal, have successively invaded the sacred enclosures, and wrought more changes in a single generation than had been effected in all the previous interval since the discovery of America. But the accompanying plan (Fig. 70), derived from surveys executed while the chief earthworks could still be traced in all their integrity, will enable the reader to comprehend their character; and if he clearly realises the scale on which these geometrical figures are constructed, he can be at no loss in recognising their essential difference from the ephemeral earthworks which mark the sites of Indian stockades or sepulchral mounds. While they present certain analogies to mound-groups and enclosures both of Europe and Asia, in many other respects they are totally dissimilar: and illustrate rites and customs of an ancient American people without a parallel among the monumental memorials of the Old World.

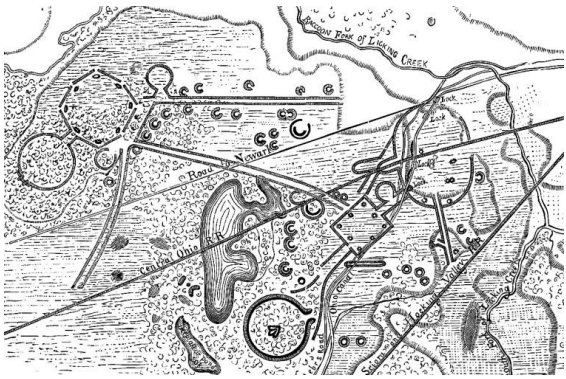


FIG. 70.—Newark Earthworks, Ohio.

Several striking coincidences between the details of these works and others of the same class are worthy of notice. The diameter of the circle, the perfect form of which has been noted, is nearly identical with two others forming parts of remarkable groups in the Scioto valley, one of them seventy miles distant. The square has also the same area as a rectangular enclosure belonging to the "Hopeton Works," where it is attached to a circle 1050 feet in diameter, and to an avenue constructed between two parallel embankments 2400 feet long, leading to the edge of a bank immediately over the river-flat of the Scioto. A like coincidence in the precise extent of the area enclosed has been noticed in the octagon of a group, called the High Bank Works, on the same river-terrace; and in another, at the junction of the Muskingum and Ohio rivers. The authors of the elaborate surveys embodied in the Smithsonian Contributions to Knowledge, remark generally that the figures of the Scioto valley earthworks are not only accurate squares and perfect circles, but are in most cases of corresponding dimensions; each square being 1080 feet a side, and the diameter of each of the larger and smaller circles a fraction over 1700 and 800 feet. This they observe is "a coincidence which could not possibly be accidental, and which must possess some significance. It certainly establishes the existence of some standard of measurement among the ancient people, if not the possession of some means of determining angles."[84] It is no less important to note that it establishes the use of instruments. A standard of measurement could not otherwise exist, still less be applied, on so large a scale in geometrical construction; and the very simplest instruments that we can conceive of, constitute no less certain

evidence of a condition of intellectual development attained by this ancient people very different from anything achieved by the most advanced Indian tribes. Varied, moreover, as the combinations of their singular groups of earthworks are, traces are clearly discernible that certain well-defined plans of construction, and a proportionate scale of parts, guided their builders. Justly estimating the importance of such coincidences, and the still greater value of the evidence of the construction of geometric figures on so large a scale, the authors of the surveys have detailed their method of procedure, in order "to put at once all scepticism at rest, which might otherwise arise as to the regularity of these works." This important point rests accordingly on the most satisfactory evidence;[85] nor are even the imperfections observed in the construction of some of the rectangular figures without their significance, as a test of the extent to which geometry had been mastered by the ancient builders.

That this remarkable class of earthworks originated in some totally different purpose from the strongholds already described, is obvious. Their site is invariably on a level plateau, and their avenues are connected with the neighbouring flats by laboriously constructed approaches, as if to facilitate the solemn march of processions. The embankments are frequently slight; where a ditch occurs it is generally in the interior; and their whole construction is in striking contrast to the defensive enclosures in their vicinity. At Newark they extend over the level terrace, and, with outlying structures, embrace an area of several miles in extent; while on each side of the Valley, formed by the Racoon Creek, military works occupy prominent elevations presenting special natural advantages for defence.

One of those, obviously of a defensive character, encloses the summit of a high hill; but it also contains a small circle with tumuli, covering “altars” corresponding to those hereafter described, which give their peculiar character to the sacred mounds. There is no room, therefore, for doubt that the various works referred to illustrate what may be styled the civil, military, and ecclesiastical structures of the same people, including in the latter public games, such as among many ancient nations constituted one special feature of their religious festivals.

One important inference deducible from the peculiar features of the works here referred to, is the state of knowledge of their constructors. The most skilful engineer of our own day would find it difficult, without the aid of instruments, to lay down an accurate square on the scale of some of those described, enclosing an area four-fifths of a mile in circumference. Circles of moderate dimensions might indeed be constructed, so long as it was possible to describe them by a radius; but with such works measuring five thousand four hundred feet, or upwards of a mile in circumference, the ancient geometrician must have had instruments, and means of measuring arcs: for it seems impossible to conceive of the accurate construction of figures on such a scale, otherwise than by finding the angle by its arc, from station to station, through the whole course of their delineation. It is no less obvious from the correspondence in area and relative proportions of so many of the regular enclosures, that the Mound-Builders possessed a recognised standard of measurement; and that some peculiar significance, possibly of astronomical origin, was attached to figures of certain forms and dimensions.



FIG. 71.—Cincinnati Tablet.

The city of Cincinnati occupies a remarkable site, within a fine basin of hills, on the Ohio river, which had for its older occupants the remarkable people now referred to. But the growth of the modern city has swept away every vestige of their old earthworks; and no definite record of their details has been preserved. One memorial, however, survives, which was discovered in 1841, when excavating a large mound within the limits of the city. It has been the subject of ingenious speculations; and may have some bearing on our present investigations. In the centre of the mound, slightly below the level of the natural surface, a skeleton was found greatly decayed, alongside of which lay two pointed bones, about seven inches long, formed from the tibia of the elk, and the engraved tablet shown in the accompanying illustration (Fig. 71). It is made of fine-grained sandstone, and measures five inches in length, by two and six-tenths across the middle, and three inches at the ends. Upon its smooth surface an elaborate figure is represented, by sinking the interspaces within a rectangular border, so as to produce what has been regarded by some as a hieroglyphic inscription. But the most remarkable feature of its graven device is the series of lines by which the plain surface at each end is divided. The ends of the stone, it will be observed, form arcs of circles of different dimensions. The greater arc is

divided by a series of lines, twenty-seven in number, into equal spaces, and within this is another series of seven oblique lines. The lesser arc at the opposite end is divided in like manner by two series of twenty-five and eight lines, similarly arranged. This tablet has not failed to receive due attention. It has been noted that it bears a “singular resemblance to the Egyptian cartouche.” Its series of lines were discovered to yield, in the sum of the products of the longer and shorter ones, a near approximation to the number of days of the year. An astronomical origin was accordingly assigned to it; and it has been surmised to be an ancient calendar, recording the approximation of the Mound-Builders to the true length of the solar year. Mr. Squier perhaps runs to an opposite extreme in suggesting that it is nothing more than a stamp, of which specimens have been found made of clay, both in Mexico and in the Mississippi mounds; and which were probably used in impressing ornamental patterns on cloth or prepared skins. Such clay stamps always betray their purpose by the handle attached to them, as in the corresponding bronze stamps common on Roman sites; whereas the Cincinnati tablet is about half an inch in thickness, with no means of holding or using it as a stamp, and bears on its unfinished reverse grooves apparently made in sharpening the tools by which it was engraved. But whatever theory be adopted as to its original object or destination, the series of lines on its two ends have justly attracted attention: for they constitute no part of the device; and can scarcely be regarded as an ornamental border. Possibly in them we have a record of certain scales of measurement in use by the Mound-Builders; and if so, the discovery is calculated to add fresh interest to our study of the geometrical structures,

which, far more than their great mounds, are the true characteristics of that mysterious people.[86]

The precise objects aimed at in the construction of the remarkable series of American earthworks here referred to must obviously be difficult to determine with certainty. Analogies to these structures have been traced in the works of Indian tribes formerly in occupation of Carolina and Georgia. They were accustomed to erect a circular terrace or platform on which their council-house stood. In front of this, a quadrangular area was enclosed with earthen embankments, within which public games were played and captives tortured. To this was sometimes added a square or quadrangular terrace at the opposite end of the enclosure. Upon the circular platform it is also affirmed that the sacred fire was maintained by the Creek Indians, as part of their most cherished rites as worshippers of the sun. But even the evidence, thus far, is vague and unsatisfactory; and any recognisable analogies point, at best, only to the possibility of some of the Indian tribes having perpetuated on a greatly inferior scale some maimed rites borrowed from their civilised precursors. The scale upon which the Southern Indian earthworks were constructed may compare with those of the Iroquois in the State of New York, but in no degree approximates to the erections of the Mound-Builders. What, for example, shall we make of the graded ways, such as that of Piketon, Ohio, where an approach has been laboriously formed from one terrace to another, one thousand and eighty feet long by two hundred and fifteen feet in greatest width? The excavated earth has been employed, in part, to construct lofty embankments on each side of the ascent, which are now covered with trees of large size. Beyond this approach, mounds and half-

obliterated earthworks indicate that it was only part of an extensive series of structures. But, viewed alone, it is one of the most remarkable monuments of prehistoric times to be found on the whole continent, and certainly bears not the slightest resemblance, either in its character or the great scale on which it is executed, to any known work of the Red Indians.

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[83] *Ancient Monuments of the Mississippi Valley*, pp. 26-29, plate x.

[84] *Ancient Monuments of the Mississippi Valley*, p. 48.

[85] *Ancient Monuments of the Mississippi Valley*, p. 57.

[86] The woodcut is engraved from a rubbing taken from the original. Mr. Whittlesey has included this tablet among his "Archæological Frauds"; but the result of inquiries made by me during a recent visit to Cincinnati has removed from my mind any doubt of its genuineness.

CHAPTER XI.

SEPULCHRAL MOUNDS.

SOURCES OF INFORMATION—HILL MOUNDS—THE SCIOTO MOUND—THE TAYLOR MOUND—THE ISSAQUINA MOUND—THE ELLIOT MOUND—THE LOCKPORT MOUND—BLACK BIRD'S

GRAVE—SCIOTO VALLEY MOUNDS—SYMBOLICAL RITES—HUMAN SACRIFICES—THE GRAVE CREEK MOUND—COMMON SEPULCHRES—CREMATION—SCIOTO MOUND CRANIUM—SACRED FESTIVALS.

When the significance of the military and sacred enclosures of the Mound-Builders has been fully estimated as memorials of a remarkable people belonging altogether to prehistoric ages of the New World, their sepulchral mounds acquire a new value. In the former we see unmistakable indications of a settled condition of society greatly in advance of anything attained by the Red Indian, and of populous communities devoted to agriculture and other industrial arts. From the latter we may hope to recover some traits of ethnical character; to find in the gifts to the dead illustrations of their arts and customs; and to catch by means of their sepulchral rites some glimpses of the nature of that belief which stimulated the Mound-Builders to the laborious construction of so many sacred earthworks. Their great mounds are for us not merely the sepulchres of an ancient race; they are the cemetery of an early though partial civilisation, from whence we may derive illustrations of the life, manners, and ideas of a people over whose graves the forest had so long resumed its sway, that it seemed to the Red Indians' supplanters to have been the first occupant of the soil.

Barrows, dunes, moat-hills, cairns, and earth or stone mounds of various kinds, abound in many parts of the Old as well as of the New World, and are nowhere more abundant than in some districts of the British Isles. But although corresponding primitive structures are met with from the Gulf of the St. Lawrence to the Isthmus of Panama, and beyond it, far into the southern continent: nevertheless the works of the Mound-Builders have a character of

their own altogether peculiar; and though numbered by thousands, they are limited to well-defined areas, leaving a large portion of the continent, including the whole of the Atlantic sea-board, without any traces of their presence. The Mound-Builders were not a maritime people. Their whole traffic was confined to the great rivers, along the banks of which their ancient traces abound, and to communication by long-obliterated overland routes of travel. Notwithstanding the careful observations which have been put on record relative to the mounds and earthworks of "The West," much yet remains to be disclosed; for, happily, the excavation of such earth-pyramids is a work greatly too laborious and costly to tempt those who are influenced by mere idle curiosity; while their contents, however valuable to the archæologist, offer no such stimulus to cupidity as, in Mexico and Peru, has led to the destruction of thousands of the memorials of extinct arts and customs.

As a general rule, the earth and stone works appear to have been alike constructed of materials derived from the immediate neighbourhood; so that such differences do not, in the majority of instances, supply any indication of diversity in the enclosed deposits. A special character, however, appears to pertain to one class, designated "Hill Mounds," from the sites they occupy. Of these Mr. Squier remarks: "The most elevated and commanding positions are frequently crowned with them, suggesting at once the purposes to which some of the mounds or cairns of the ancient Celts were applied: that of signal or alarm posts. It is not unusual to find detached mounds among the hills back from the valleys, and in secluded places, with no other monuments near. The hunter often encounters them in the depths of

the forests when least expected: perhaps overlooking some waterfall, or placed in some narrow valley where the foot of man seldom enters." Similar structures crown many western heights; but some at least are of Indian origin; and our knowledge of the characteristics and contents of those of an earlier race must be greatly extended, before we can assign the true and probably varied objects aimed at in their erection.

But it is to the exploration of one of the smaller hill-mounds that we owe the recovery of the most characteristic illustration of the physical type of the ancient Mound-Builders. The "Scioto Mound Cranium," described in a later chapter, was obtained from a mound erected on the summit of a commanding height overlooking the valley of the Scioto, with its numerous earthworks. A conical knoll, crowning the hill, rises with such regularity as almost to induce the belief that it is artificial; and on its apex stands the tumulus overshadowed by the trees of the primitive forest. Here under a covering of tough yellow clay, impervious to moisture, a plate of mica rested on an inner cairn, composed chiefly of large rough stones; and within this, a compacted bed of carbonaceous matter contained the skull, with a few bones, and some shells of fresh-water molluscs, disposed irregularly round it. This, therefore, it will be seen, confirms the idea that cremation played an important part in the ancient sepulchral rites.

More recently Professor O. C. Marsh explored the Taylor Mound, another of the hill-mounds, about two and a half miles south of Newark. Apparently a cemetery had been excavated on the summit of the ridge, within which lay the remains of at least eight skeletons, chiefly of women and children, all huddled together, and some of them showing evidence of long

exposure. Along with those were found nine lance or arrow-heads of flint, six small axes, one of them made of hematite, and the remainder of diorite or compact greenstone, a small wedge or hatchet of hematite, a flint chisel, a scraper, numerous implements of bone and horn, including needles, a spatula or modeller's tool, and a whistle made from the tooth of a black bear. Above this ossuary a number of dead had been disposed: some of them evidently interred with care, others as if slaughtered and flung upon the heap of dead; while a mass of incinerated human remains left no doubt on the minds of the explorers that cremation had taken place directly over the dead, and before the regular interment was completed. Hence they were led to the conclusion that the funeral rites had probably included a suttee sacrifice.

Directly under the apex of the mound upwards of one hundred beads of native copper, intermingled with a few shell beads, lay in contact with portions of the cervical vertebræ of a young child, showing that they had been worn as a necklace. The shell beads are about half an inch long, and have been carefully polished. The copper beads are only half this length, and wrought with the hammer out of the native copper; but with so much skill, that in most of them it is difficult to detect the joining. Only two of the skulls were sufficiently preserved to indicate their true form. Both were small, and showed the vertical occiput and large parietal diameter, supposed to pertain to the Mound-Builders, but which are characteristic of many American crania.

The contents of the two hill-mounds are thus seen to differ widely; and so far furnish no clew to any special mode of burial or funeral ceremonies. But the interment of a detached skull, as shown in the Scioto

Mound, is no solitary case. I was shown by Mr. L. M. Hosea, of Cincinnati, a large bowl-shaped vessel of steatite, capable of holding about two gallons, discovered by the blowing down of a tree which stood on the summit of a mound on the borders of Lincoln and Casey Counties, Kentucky. It had been inverted over a human skull, beside which lay a number of shell beads, and a quantity of mica. In the same mound was a large conch-shell, hollowed out, and filled with bone implements, including two large, well-finished whistles, several deers' horn hammers, and about thirty bone pins and awls. A perforated copper plate, and some well-finished stone and flint implements, completed the contents of the mound. Unfortunately the skull was too much decayed to admit of preservation.

I am indebted to Mr. W. Marshall Anderson for some curious disclosures of the contents of another mound recently opened by him at Issaquina, Mississippi. The first remarkable discovery was the exposure of three skeletons disposed vertically, as if they had been buried with their heads above ground. On reaching the natural level, a heap of ashes, with numerous fragments of bone, showed where cremation had taken place. Over this were three skeletons disposed at length, side by side, with a drinking vessel and a wide-mouthed bowl of native pottery close to the head of each. Numerous implements, including tools of copper, well-finished celts of jasper and lignite, and a grotesque clay-pipe representing a human head with dog's ears, and a frog's mouth, lay alongside of them. But most noticeable of all was the discovery of two inverted bowls in the centre of the mound, underneath each of which lay a human skull. One of them is described by Mr. Anderson as "a beautiful skull, worthy of a

Greek." But on being exposed to the sun, as they dried, they crumbled to ashes, "literally," as he says, "disintegrating before my eyes, whilst I was busy gathering up copper and stone implements which would have waited for ever unharmed."

The only skeletons exposed in the Evans Mound, —a large mound, near Newark, Ohio, at the opening of which I was present, were in a similar condition of extreme decay. Among the contents of the Taylor Mound, in the same locality, the curious fact was communicated to me, that the fractured quarter of a nearly spherical mass of hematite was found, which at the time attracted less notice than a well-finished wedge and hatchet of the same material. But on subsequently opening the Elliot and Wilson Mounds, situated about five miles apart, in the same valley, each of them was found to include among its contents a corresponding fragment of hematite, which on being placed in juxtaposition, proved to be portions of the same broken sphere, or nodule of hematite, valued in all probability for some wonder-working power. Meteoric stones and pieces of hematite have been repeatedly found in the Mounds; and were evidently objects of special regard. The Elliot Mound furnished another object of interest, in a pipe 7½ inches long, neatly carved in grey limestone, with the bowl finished in the form of a bear's head. As shown in Fig. 72, it is of an unusual style of design.



FIG. 72.—Stone Pipe, Elliot Mound, Ohio.

The establishment of the village of Lockport, on

the outskirts of Newark, and the more recent erection of extensive ironworks there, have swept away a curious group of mounds in that neighbourhood, including a truncated pyramid, the contents of which appear to have been of unusual interest. I examined in the collection of Mr. Wm. L. Merrin, a solid copper armlet, a pair of remarkable objects like double cymbals, a sheath subdivided into three tubes, supposed to be a quiver, a polished axe, and several perforated plates, all of copper; a perforated lead amulet, a polished chisel of diorite, numerous large shell beads, and large plates of mica cut into a horse-shoe shape: all of which were found at the base of the Lockport Mound, along with a number of skeletons. Subsequently other objects of interest, including a large, well-finished stone maul, of oval shape, with a deep groove round its centre, and a mass of pure lead weighing upwards of four pounds, have been found on its site, in opening up a road. But it is obvious that in this, as in so many other cases, we have to regret the destruction of a valuable memorial of the past, without any adequate record of its disclosures being preserved. Happily a more intelligent interest has now been awakened in the subject; the rarer objects of antiquity in stone and in metal are highly prized, and are therefore likely to be preserved as marketable articles even by those who can see in them no other value; and as each mound or earthwork discloses some novel feature, further research may be expected to add materially to our knowledge.

The remoter hill-mounds may reveal similar analogies in structure or contents to those of the plains; and so furnish evidence that the population which crowded the great centres, was diffused in smaller numbers, far inland from the river’s banks, in

outlying valleys and among the secluded recesses of the hills. There, perhaps, as among the higher valleys of the Andes under the rule of the Incas, a pastoral people supplemented the agricultural industry of the central provinces, and shared with them the common rites and superstitions of the national religion.

In some cases the lofty site of the hill-mound may have determined its selection from the same motive which occasionally guides the modern Indian in his choice of a spot for his grave. Of this a striking illustration is furnished in the history of one modern tumulus on the Missouri. Upwards of half a century has elapsed since Black Bird, a famous chief of the Omahaws, visited the city of Washington, and when returning was seized with small-pox, of which he died on the way. When the chief found himself dying, he called his warriors around him, and, like Jacob of old, gave commands concerning his burial, which were as literally fulfilled. Dressed in his most sumptuous robes, and fully equipped with his scalps and war-eagle's plumes, he was borne about sixty miles below the Omahaw village, to one of the loftiest bluffs on the Missouri, which commands a magnificent extent of river and landscape. His favourite war-horse, a beautiful white steed, was led to the summit; and there, in presence of the whole nation, the dead chief was placed on its back, looking towards the river, where, as he had said, he could see the canoes of the white men as they traversed the broad waters of the Missouri. His bow was placed in his hand, his shield and quiver, with his pipe and medicine-bag, were hung by his side. A store of pemmican and a well-filled tobacco-pouch were supplied, to sustain him on the long journey to the hunting-grounds of the good Manitou, where the spirits of his fathers awaited his coming. The

medicine-men of the tribe performed their most mystic charms to secure a happy passage to the land of the great departed; and all else being completed, each warrior of the chiefs own band covered the palm of his right hand with vermilion, and stamped its impress on the white sides of the devoted war-steed. This done, the Indians gathered turfs and soil, and placed them around its feet and legs. Gradually the pile rose with the combined labour of many willing hands, until the living steed and its dead rider were buried together under the memorial mound; and high over the crest of the lofty tumulus which covered the warrior's eagle-plumes, a cedar post was reared to mark more clearly to the voyagers on the Missouri, the last resting-place of Black Bird, the great chief of the Omahaws.

One of the most striking evidences of the extent of occupation of the country, and the denseness of its ancient population, is furnished by a map in the *Ancient Monuments of the Mississippi Valley*, showing a section of twelve miles of the Scioto Valley. Square, circular, and polygonal enclosures, single and in groups, parallels, ditches, and mounds, occupy every available terrace along the banks of the Scioto River, and its tributary Paint Creek. A group of mounds in Ross county, Ohio, occupies the third terrace on the east side of the Scioto Valley, nearly a hundred feet above the river, and about equidistant from two remarkable sacred enclosures. The principal mound is twenty-two feet high; and on penetrating to its centre the traces of a rude sarcophagus of unhewn logs were indicated by the cast which still remained in the compacted earth. The bottom had been laid with matting or wood, the only remains of which were a whitish stratum of decomposed vegetable matter; and the timbers of the sarcophagus had in

like manner decayed, and allowed the superincumbent earth to fall on the skeleton. Alongside of it were several hundred beads, made of the columellæ of marine shells and the tusks of some animal, several of them bearing marks which seemed to indicate that they were turned, instead of being carved, or ground into shape by the hand. They retained their position, forming a triple row, as originally strung round the neck of the dead; and, with the exception of a few laminæ of mica, were the only objects discovered in the grave. A layer of charcoal, about ten feet square, lay directly above the sarcophagus; and seemed, from the condition of the carbonised wood, to have been suddenly quenched by heaping the earth over it while still blazing.

Similar layers of charcoal constitute a noticeable feature in mounds of this class, and seem to indicate either that sacrifices were performed over the bier, or that funeral rites of some kind were celebrated, in which fire played an important part. On these funeral pyres probably many perishable articles were consumed; as the beds of charcoal are intermingled occasionally with fragments of bone, stone implements, and other evidences of sacrifices and tribute to the deceased. It is also apparent that the fire was kindled and allowed to blaze only for a limited time, when its flames were quenched by heaping the earth over the glowing embers; so that while charcoal occurs beneath as well as above the skeleton, the bones are unaffected by fire. The rite was practised where cremation was not followed; and may have been symbolical of the lamp of life quenched for ever in the grave. Implements, both of stone and metal, have been found in these grave-mounds, but for the most part their contents indicate

a different condition of society and mode of thought from what Indian sepulture implies. Weapons are of rare and exceptional occurrence. The more common articles are personal ornaments, such as bracelets, perforated plates of copper, beads of bone, shell, or metal, and similar decorations worn on the body at the time of its interment. Among the objects which appear to have been purposely disposed around the dead, plates of mica occur most frequently. In some cases the skeleton has been found entirely covered with this material; and in others the laminæ have been cut into regular figures: disks, ovals, and symmetrical curves. As a general rule, however, it would appear that reverence for the dead was manifested in other ways than by depositing costly gifts in the grave; nor do the relics found indicate any belief akin to that which induces the modern Indian to lay beside his buried chief the arms and weapons of the chase, for use by him in the future hunting-grounds or on the war-path. In a few cases the simple sarcophagus has been constructed of stone instead of wood; in others the body appears to have been merely wrapped in bark or matting. In some of the Southern States both cremation and urn-burial seem to have been practised; but throughout the valleys of the Ohio and its tributaries a nearly uniform system of sepulchral rites has been traced. These no doubt bore some important relation to the solemn religious observances indicated by other works of the same people; and as it is not in the sepulchral mounds, but in those which cover the “altars” on which the sacrificial fires of the ancient worshippers appear to have often blazed, that the greater number of their works of art, and even their implements and weapons have been found: it may be that there, rather than at the grave-mounds, they

propitiated the manes of the dead, and sought by sacrifices of love and reverence to reach beyond this world to one unseen. Other indications, however, present analogies to the arrangements of cists and cinerary urns in ancient British tumuli, which suggest no less clearly the probability of human sacrifices, and a suttee self-immolation at the grave of the great chief, so congenial to the ideas of barbaric rank. Such cruel rites we know were practised among the Mexicans and Peruvians on the largest scale; wives, concubines, and attendants being immolated by the latter on the tomb of their deceased Inca, in some cases even to the number of thousands.

The Grave Creek Mound, at the junction of Grave Creek with the Ohio river, in the State of Virginia, commands, on various accounts, a prominent distinction among the sepulchral monuments of America. It occupies a site on an extensive plain in connection with works now much obliterated; but its own gigantic proportions bid effectual defiance to the operations which are rapidly erasing less salient records of the ancient occupants of the soil. In the year 1838, when various circumstances combined to direct an unusual degree of attention to American antiquities, Mr. Tomlinson, the proprietor of the land, had it explored at considerable cost. A shaft sunk from the top, and a tunnel carried to the centre, disclosed two sepulchral chambers, one at the base, and another thirty feet above. They had been constructed, as in other cases, of logs, which had decayed, and permitted the superincumbent earth, with stones placed immediately over them, to fall upon the skeletons. In the upper chamber a single skeleton was found in an advanced state of decay, whilst the lower one contained two skeletons, one of

which was believed to be that of a female. Beside these lay between three and four thousand shell beads, a number of ornaments of mica, several bracelets of copper, and sundry relics of stone carving, referred to, along with works of art from other ancient mounds, in a future chapter. But among them was included an inscribed stone disc, which constitutes one of the marvels of American antiquities. On reaching the lower vault, after removing its contents, it was determined to enlarge it into a convenient chamber for visitors, and in doing so ten more skeletons were discovered, all in a sitting posture, but in too fragile a state to admit of preservation. The position of these immediately around the sepulchral chamber, in the very centre of the mound, precludes all idea of subsequent interment, and scarcely admits of any other mode of accounting for their presence than that which the human sacrifices both of ancient and modern American obsequies suggest.

A tumulus of the gigantic proportions of the Grave Creek Mound serves emphatically to impress the mind with the conviction that such structures, even when of smaller dimensions, were no accompaniments of common sepulture, but the special memorials of distinguished chiefs; or, it may be, at times, of venerated priests. Of the busy population that once thronged the valleys of the West we have no other memorials than those which commemorate the toil of many to give a deathless name to one now as nameless as themselves. The investigators of their works, after describing in detail the monumental mounds, remark: “The graves of the great mass of the ancient people who thronged our valleys, and the silent monuments of whose toil are seen on every hand, were not thus signalised. We

scarcely know where to find them. Every day the plough uncovers crumbling remains, but they elicit no remark; are passed by, and forgotten. The wasting banks of our rivers occasionally display extensive cemeteries; but sufficient attention has never been bestowed upon them to enable us to speak with any degree of certainty of their date, or to distinguish whether they belonged to the Mound-Builders or a subsequent race. These cemeteries are often of such extent as to give a name to the locality in which they occur. Thus we hear, on the Wabash, of the 'Big Bone Bank' and the 'Little Bone Bank,' from which, it is represented, the river annually washes many human skeletons, accompanied by numerous and singular remains of art, among which are more particularly mentioned vases and other vessels of pottery, of remarkable and often fantastic form."[87] I have been fortunate enough to obtain an interesting example of the latter class of pottery, from Big Bone Bank, figured on a subsequent page, which is specially valuable from the striking analogy it suggests to familiar forms of Peruvian pottery.

The Ohio and Erie canal traverses the river-terrace of the Scioto Valley in the vicinity of Chillicothe, where the ancient works of the Mound-Builders are more abundant than in any other area of equal limits hitherto explored. In some cases the canal has been cut through them, and it can scarcely admit of doubt that many interesting traces of the arts and habits of the remarkable people who once filled the long-deserted scene, must have been disclosed to heedless eyes. Here and there, doubtless, a stray relic was picked up, wondered at, and forgotten; but no note was taken of the circumstances under which it was found, and no record made of the discovery. And so must it ever be.

The pioneers of civilisation in the uncleared wilds of the West are too entirely preoccupied with the present, to spare a thought for long forgotten centuries. Happily, however, this state of things is passing away, and every year shows increasing evidence of intelligent zeal in the recovery and preservation of whatever is calculated to throw light on the prehistoric ages of America.

The contents of the Scioto Valley Mound, as well as of others described above, prove that the human remains were deposited in them long after the body had gone to decay; and while numerous indications serve to show that cremation was extensively practised by the Mound-Builders, it is not improbable that a custom may have prevailed analogous to the modern Indians' scaffolding and subsequent sepulture of the bones of their dead. The remains thus periodically gathered were sometimes deposited in a common ossuary, as in that of the Taylor Mound; and in other cases were burnt, with fitting rites, and their ashes heaped together, forming mounds, such as one opened on the bank of Walnut Creek, in the Scioto Valley. The principal portion of this consisted seemingly of long-exposed and highly-compacted ashes, intermingled with specks of charcoal, and small bits of burned bones. Beneath this was a small mound of very pure white clay, resting on the original soil, without any traces of the action of fire, over which the incinerated remains had been piled into a mound, nine feet in height by forty in base. The customs of the North American Indians, however, were very diverse; and among the ancient Mexicans and Peruvians inhumation, cremation, urn-burial, and mummification, accompanied with deposition in artificial vaults and in caves, were all practised. It need not therefore

surprise us to find exceptions among the ancient Mound-Builders to any practice recognised as most prevalent among them. Considering the decayed state of most of the bones recovered from the great sepulchral mounds, where they were equally protected from external air and moisture: if the common dead were inhumed under the ordinary little grave-mound, their bones must, for the most part, have long since returned to dust. Nor must it be overlooked that the extremely comminuted state to which most of the skeletons in the larger mounds have been reduced, when brought to light by modern explorers, is due, in part at least, to the falling in of a superincumbent mass of earth and stones upon them, when the timber ceiling of their sarcophagus had sustained the weight long enough only to render them the less able to resist its crushing force. The perfect preservation of the "Scioto Mound cranium" was due to its being imbedded in charcoal, over which a superstructure of large stones enveloped with tough yellow clay had been piled, without any treacherous timber vaults. It lay in the centre of the carbonaceous deposit, resting on its face. The lower jaw was wanting, and only the clavicle, a few cervical vertebræ, and some of the bones of the feet were huddled around it. Unaccompanied though it was by any relics of art, it is, in itself, one of the most valuable objects hitherto recovered from the American mounds.

Such are some of the traces we are able to recover of the sepulchral rites of this people. In discussing the conclusions suggested alike by their disclosures, and by those which the sacrificial mounds, the sacred circumvallations, and the buried works of art reveal, we are dealing with characteristics of a race pertaining to periods long

preceding any written history. For us these are their sole chronicles; and yet, even from such data, we are able to deduce some traits of moral and intellectual character. Perhaps the most important fact for our present purpose is the rarity of weapons of war among the sepulchral deposits. It accords with other indications of the condition of the Mound-Builders. They had passed beyond that rude stage of savage life in which war and the chase are the only honourable occupations of man. Their weapons of war, like their fortresses, were means for the defence of acquisitions they had learned to prize more highly. They had conquered the forests, and displaced the spoils of the hunter with the wealth of autumn's harvestings; and with the habits of a settled agricultural people, many new ideas had taken the place of the wild imaginings and superstitions of the savage. As among all agricultural nations, the vernal and autumnal seasons doubtless had their appropriate festivals; and we can still, in imagination, reanimate their sacred enclosures and avenues with the joyous procession bearing its thank-offering of first-fruits, or laden with the last golden treasures of the harvest-home.

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[87] *Ancient Monuments of the Mississippi Valley*, p. 171.

CHAPTER XII.

SACRIFICIAL MOUNDS.

MOUND ALTARS—ALTAR DEPOSITS—QUENCHING THE ALTAR FIRES—MOUND HEARTHS—MOUND CITY—MILITARY ALTAR MOUNDS—THEIR STRUCTURE AND CONTENTS—SIGNIFICANCE OF THEIR DEPOSITS—ANALOGOUS INDIAN RITES—TRANSITIONAL CIVILISATION.

The name of sacrificial mounds has been conferred on a class of monuments peculiar to the New World, and highly illustrative of the rites and customs of the ancient race of the mounds. From their contents also we derive many of the most interesting examples of the arts of that singular people. The most noticeable characteristics of the sacrificial mounds are: their almost invariable occurrence within enclosures; their regular construction in uniform layers of gravel, earth, and sand, disposed alternately in strata conformable to the shape of the mound; and their covering a symmetrical hearth or altar of burnt clay or stone, on which are deposited numerous relics, in all instances exhibiting traces, more or less abundant, of their having been exposed to the action of fire.

A sufficient number of sacrificial mounds has been opened to justify the adoption of certain general conclusions relative to their construction and the purposes for which they were designed. On the natural surface of the ground, in most cases, a basin of fine clay appears to have been modelled with care, in a perfectly symmetrical form, but varying in shape, and still more in dimensions. They have been found square, round, elliptical, and in the form of parallelograms; and, in size, range from a diameter of two feet, to fifty or sixty feet long, and twelve or fifteen feet wide. The most common dimensions, however, are from five to eight feet in diameter. The clay basin, or “altar,” as it has been designated, invariably exhibits traces of having been subjected to the action of fire, and frequently of intense and long-

continued or oft-repeated heat. It is, moreover, evident that in some cases it had not only been often used; but, after being destroyed by repeated exposures to intense heat, it had been several times remodelled before it was finally covered over by the superincumbent mound.

Within the focus or basin of the altars are found numerous relics: elaborate carvings in stone, ornaments cut in mica, copper implements, disks, and tubes, pearl, shell, and silver beads, and various other objects, hereafter referred to, but all more or less injured by fire. In some cases the carved pipes and other works in stone have been split and calcined by the heat, and the copper relics have been melted, so that the metal lies fused in shapeless masses in the centre of the basin. Traces of cloth completely carbonised, but still retaining the structure of the doubled and twisted thread; ivory or bone needles, and other objects destructible by fire, have also been observed; and the whole are invariably found intermixed with a quantity of ashes. Large accumulations of calcined bones, including fragments of human bones, also lay above some of the deposits, or mingled with them; and in other cases a mass of calcined shells, or of fine carbonaceous dust, like that formed by the burning of vegetable matter, filled up the entire hollow. But while it is obvious from a few traces, that the deposits on the altars had included offerings of objects which yielded at once to the destructive element to which they were there exposed, as well as others capable in some degree of withstanding the intensity of the flame: there are only faint traces of all but the least destructible relics of stone or metal. In one mound portions of the contents were cemented together by a tufa-like substance of a grey

colour, resembling the scoriæ of a furnace, and of great hardness. But subsequent analyses demonstrated that it was made up in part of phosphates; and a single fragment of partially calcined bone found on the altar was the patella of a human skeleton. The long-continued, and probably oft-repeated application of intense heat had reduced the cemented mass to this condition. A quantity of pottery, many implements of copper, and a large number of spear-heads chipped out of quartz and manganese garnet, were also deposited on the hearth; but they were intermixed with much coal and ashes, and were all more or less melted or broken up with the intense action of the fire. Out of a bushel or two of fragments of the spear-heads, and of from fifty to a hundred quartz arrow-heads, only four specimens were recovered entire. Scattered over the deposits of earth filling one of the compartments, were traces of a number of pieces of timber, four or five feet long, supposed by the explorers to have supported a funeral or sacrificial pile. They had been somewhat burned, and the carbonised surface preserved their casts in the hard earth, although the wood had entirely decayed. They had been heaped over while glowing, for the earth around them was slightly baked; and thus, after repeated, and perhaps long-protracted sacrificial rites, some grand final service had consummated the religious mysteries; and the blazing altar was quenched by means of the tumulus that was to preserve it for the instruction of future ages.

The evidence that some of the altars remained in use for a considerable period, and were repeatedly renewed ere they were finally covered over, has suggested the idea that they are no more than the hearths of the ancient Mound-Builders' dwellings.

But in some cases a single altar-hearth has been found within extensive circumvallations. When in groups their enclosures are slight demarcations, as of places sacred to religious observances, and not defensive embankments with outer ditch. Their contents cannot be regarded as mere miscellaneous deposits, either like the waste heap of an Indian hut, or the contents of the modern Indian's ossuary; and it is obvious that those hearths have been systematically overlaid with mounds constructed with great care, even where they were devoid of other traces than the ashes of their final fires. In one large mound, for example, one hundred and forty feet in length, by sixty feet in greatest breadth,—already referred to as that in which so many quartz spear and arrow-heads, with copper and other relics, were found;—a new and smaller hearth was observed to have been constructed within the oblong basin of the original altar. In this all the relics deposited in the mound were placed, and the outer compartments of the large basin had been filled up with earth to a uniform level, the surface of which showed traces of fire. A more minute examination led to the discovery that three successive altars had been constructed, one above another, in addition to the smaller hearth or focus which had received the final offerings, ere it was buried under its enclosing mound. In other examples the altars have been observed to be very slightly burned; but wherever such was the case, they have also been destitute of remains.

Along with the evidences of a uniformity of system and purpose in those structures, there is also considerable variety in some of their details; and one group may be selected, as on several accounts possessing peculiar features of interest. On the

western bank of the Scioto, an ancient enclosure occupies a level terrace immediately above the river. In outline it is nearly square with rounded angles, and consists of a simple embankment, between three and four feet high, unaccompanied by a ditch, or any other feature suggestive of its having been a place of defence. It encloses an area of thirteen acres, within which are twenty-four mounds, including the large oblong one already referred to. The whole of these have been excavated, and found to contain altars and other remains, suggestive of places of sacrifice, and not of sepulture. Here, therefore, it may be assumed, was one of the sacred enclosures of the Mound-Builders. The name of "Mound City" has been given to it; and the results of its exploration prove it to have been one of the most remarkable scenes of ancient ceremonial in the Scioto Valley. It would almost seem as if here an altar had been reared to each god in the American pantheon; for not the least remarkable feature observed in reference to this class of mounds is, that they do not disclose a miscellaneous assemblage of relics, like the Indian's ossuary or grave-mound. On the contrary, the sacrificial deposits are generally nearly homogeneous. On one altar sculptured pipes are chiefly found, to the number of hundreds; on another pottery, copper ornaments, stone implements, or galena; on others, only an accumulation of calcined shells, carbonaceous ashes, or burnt bones. One mound of this enclosure covered a hearth in the form of a parallelogram of the utmost regularity, measuring ten feet in length, by eight in width, and containing a deposit of fine ashes, with fragments of pottery, from which the pieces of one beautiful vase were recovered and restored. With these also lay a few shell and pearl beads. In another oblong mound,

the altar was an equally perfect square, but with a circular basin, remarkable for its depth, and filled with a mass of calcined shells. Another, though of small dimensions, contained nearly two hundred pipes, carved with ingenious skill, of a red porphyritic stone, into figures of animals, birds, reptiles, and human heads. In addition to these were also disks, tubes, and ornaments of copper, pearl and shell beads, etc., but all more or less injured by the heat, which had been sufficiently intense to melt some of the copper relics. The number of the objects found in this mound exceed any other single deposit. Some of them supply illustrations of great importance relative to the arts, habits, and probable origin of their makers; and that they were objects of value purposely exposed to the destructive element can scarcely admit of doubt. A like diversity marks the contents of other mounds, both within the enclosure referred to, and in others where careful explorations have been effected. From one, for example, upwards of six hundred disks of hornstone were taken, and it was estimated that the entire deposit numbered little short of four thousand.

It thus appears that sacrifices by fire were practised as an important and oft-repeated part of the sacred rites of the Mound-Builders; and also that certain specific and varying purposes were aimed at in the offerings. The altar-mounds are chiefly found within what appear to have been enclosures devoted primarily, if not exclusively, to religious purposes; but they also occur, generally as single works, within the military strongholds: where it may be assumed they sufficed for sacrifices designed to propitiate the objects of national worship, and to win the favour of their deities, when the garrisons were precluded from access to the sacred enclosures where national

religious rites were chiefly celebrated.

Within a quarter of a mile of “Mound City” a work of somewhat similar outline, but of larger dimensions, suggests the idea of a fortified site: not designed as a military stronghold, but as a walled town, wherein those who officiated at the sacrifices of the adjacent temple may have resided. Unlike the slight enclosure of the latter, its walls are guarded by an outer fosse; and if surmounted by a palisade, or other military work, they were well suited for defence. The area thus enclosed measures twenty-eight acres; and nearly, if not exactly, in the centre is a sacred mound, which covered an altar of singular construction, and with remarkable traces of sacrificial rites. It had undergone repeated changes before its final inhumation. Upon the altar was found an accumulation of burnt remains, carefully covered with a layer of sand, above which was heaped the superstructure of the mound. “The deposit consisted of a thin layer of carbonaceous matter, intermingled with which were some burnt human bones, but so much calcined as to render recognition extremely difficult. Ten well-wrought copper bracelets were also found, placed in two heaps, five in each, and encircling some calcined bones,—probably those of the arms upon which they were worn. Besides these were found a couple of thick plates of mica, placed upon the western slope of the altar.”[88]

All investigations coincide in proving that the altars of the Mound-Builders were used for considerable periods, and that their final incovering was effected with systematic care. In this respect they present a striking contrast to the sepulchral mounds of the Indians, the largest and most imposing of which are no more than huge grave-mounds, or earth-pyramids, sometimes elliptical or

pear-shaped, but exhibiting in their internal structure no trace of any further design than to heap over the sarcophagus of the honoured chief such a tumulus as should preserve his name and fame to after times.

The investigation of this class of ancient works suggests many curious questions to which it is difficult to furnish any satisfactory answer. It seems probable that not only each successive stage in the use and reconstruction of the altar, but in the building of the superincumbent mound, had its own significance and accompanying rites. In one of the "Mound City" structures, after penetrating through four successive sand-strata, interposed at intervals of little more than a foot between layers of earth; and excavating altogether to a depth of nineteen feet: a smooth level floor of slightly burned clay was found, covered with a thin layer of sand, and on this a series of round plates of mica, ten inches or a foot in diameter, were regularly disposed, overlapping each other like the scales of a fish. The whole deposit was not uncovered, but sufficient was exposed to lead the observers to the conclusion that the entire layer of mica was arranged in the form of a crescent, the full dimensions of which must measure twenty feet from horn to horn, and five feet at its greatest breadth. In some mounds the accumulated carbonaceous matter, like that formed by the ashes of leaves or grass, might suggest the graceful offerings of the first-fruits of the earth. In others, the accumulation of hundreds of elaborately carved stone pipes on a single altar, is suggestive of some ancient peace- or war-pipe ceremonial, in which the peculiar American custom of tobacco-smoking had its special significance, and even perhaps its origin. In others again, we should perhaps trace in the deposition under the sacred mound of hundreds of spear and arrow-heads, copper

axes, and other weapons of war, a ceremonial perpetuated in the rude Indian symbolism of burying the tomahawk or war-hatchet. But looking to the evidence which so clearly separates the sepulchral from the sacred mounds, it is scarcely possible to avoid the conclusion that on some of the altars of the Mound-Builders human sacrifices were made; and that within their sacred enclosures were practised rites not less hideous than those which characterised the worship which the ferocious Aztecs are affirmed to have regarded as most acceptable to their sanguinary gods. Among the Mexicans, if we are to believe the narratives of their Spanish conquerors, human sacrifices constituted the crowning rite of almost every festival. That great exaggeration is traceable in the narratives of the chronicles is admitted in part even by the enthusiastic historian of the conquest of Mexico; and the charming historical romance woven by Prescott, is perhaps even more open to question in its reproduction of the gross charges of cannibalism and wholesale butchery in the superstitious rites of the Mexicans: than in its gorgeous picturings of their architectural magnificence, their temples and palaces, sculptured fountains, floating gardens, and all the strange blending of Moorish luxury, with the refinements of European life, and its unreserved freedom of women.

Nothing corresponding to the geometrical enclosures or altar-mounds of the Mississippi Valley appears among the works of any Indian nation known to Europeans. Nevertheless in searching for evidence of their ethnical affinities, we are naturally led to inquire if no traces of their peculiar rites and customs can be detected in the ruder practices of savage nations found in occupation of their deserted sites; and some of those in use by different Indian

tribes undoubtedly suggest ideas such as may have animated the ancient people of the valley in the construction and use of their mounds of sacrifice. One class of mound relics, for example, is thus illustrated in Hariot's narrative of the discovery of Virginia in 1584. He describes the use of tobacco, called by the natives *uppówoc*, and greatly enlarges on its medicinal virtues. He then adds: "This *uppówoc* is of so precious estimation amongst them that they think their gods are marvellously delighted therewith, whereupon sometime they make hallowed fires, and cast some of the powder therein for a sacrifice." The discovery of unmistakable evidence that one of the sacred altars of "Mound City" was specially devoted to nicotian rites and offerings, renders such allusions peculiarly significant. In the belief of the ancient worshippers, the Great Spirit smelled a sweet savour in the smoke of the sacred plant; and the homely implement of modern luxury became in their hands a sacred censer, from which the vapour rose with as fitting propitiatory odours as that which perfumes the awful precincts of the cathedral altar, amid the mysteries of the Church's high and holy days.

It is indeed a vague and partial glimpse that we recover of the old worshipper, with his strange rites, his buried arts, and the traces of his propitiatory sacrifices. But slight as it is, it reveals a condition of things diverse in many respects from all else that we know of the former history of the New World; and on that account, therefore, its most imperfect disclosures have an interest for us greater than any discoveries relating to the modern Indian can possess. Still more is that interest confirmed by every indication which seems to present the ancient Mound-Builders as in some respects a link between

the rude tribes of the American forests and prairies, and those nations whom the first Europeans found established in cities, under a well-ordered government, and surrounded by many appliances of civilisation akin to those with which they had been long familiar among ancient nations of southern Asia. To the great centres of native progress still manifest in the ruined memorials of extinct arts in Central America, and illustrated by so many evidences of national development attained under Aztec and Inca rule, attention must be directed with a view to comprehend whatever was essentially native to the New World. But before turning southward to those seats of a well-ascertained native civilisation, there still remains for consideration one other class of earthworks of a very peculiar character. The mineral regions from whence the Mound-Builders derived their stores of copper have been described; but between them and the populous valleys of the Ohio, an extensive region intervenes, abounding in monuments no less remarkable than some of those already referred to; and valuable as a possible link in the detached fragments of such ancient chroniclings. Lying as they do in geographical, and perhaps also in other relations, immediately between the old regions of the Mound-Builders and the Miners of ante-Columbian centuries, they cannot be overlooked in any archæological researches into the history of the New World.

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[88] *Ancient Monuments of the Mississippi Valley*, p. 157.

CHAPTER XIII.

SYMBOLIC MOUNDS.

THE WISCONSIN REGION—ANIMAL MOUNDS—SYMBOLIC MOUNDS—BIG ELEPHANT MOUND—DADE COUNTY MOUNDS—MAGNITUDE OF EARTHWORKS—ENCLOSED WORKS OF ART—ROCK RIVER WORKS—THE NORTHERN AZTALAN—ANCIENT GARDEN BEDS—THE WISCONSIN PLAINS—A SACRED NEUTRAL LAND—THE ALLIGATOR MOUND—THE GREAT SERPENT, OHIO—SERPENT SYMBOLS—INTAGLIO EARTHWORKS—SUGGESTIVE INFERENCES—THE ANCIENT RACE—A SACERDOTAL CASTE—ANTIQUITY OF THE RACE—INFERIORITY OF THE INDIAN TRIBES.

The well-watered region which stretches westward from Lake Michigan to the Mississippi, was occupied until recently by a comparatively dense Indian population; and even now affords shelter to the remnants of native tribes. But besides the traces of their ephemeral dwellings and graves, it abounds with earthworks of a distinctive character, peculiar to the New World. But of this as of other partially explored regions of the west, the earlier accounts were vague and contradictory; and it is only very recently that the characteristics of its monuments have been accurately defined. Mr. J. A. Lapham, to whose *Antiquities of Wisconsin surveyed and described*, the minute knowledge of these remarkable earthworks is chiefly due, claims to have first described the Turtle Mound at Waukesha and other animal effigies of the same territory, so early as 1836. These notices, however, only appeared in local newspapers; and general attention was for the first time directed to them by Mr. R. C. Taylor in the *American Journal of Arts and Sciences*, in 1838. Their peculiar character was thereby perceived, and such general interest awakened, that the American Antiquarian Society was induced to place funds at

Mr. Lapham's disposal for carrying out the elaborate surveys since published.

The occurrence of "Animal Mounds" is by no means exclusively confined to the State of Wisconsin. Some examples are specially worthy of notice among the varied earthworks of the Ohio and Scioto Valleys. But the important fact connected with the aboriginal traces of Wisconsin is that its Animal Mounds do not occur interspersed, as in the Ohio Valley, with civic and sacred enclosures, sepulchral mounds, and works of defence; but within its well-defined limits, thousands of gigantic basso-relievos of men, beasts, birds, and reptiles, all wrought with persevering labour on the surface of the soil, constitute its distinguishing characteristic; and disclose no evidence of their construction with any other object in view than that of perpetuating their external forms. The vast levels or slightly undulating surfaces of prairie land present peculiarly favourable conditions for the colossal relievos of the native artist: yet not more so than are to be met with in other localities where no such mounds occur. It is important therefore to bear in remembrance that defensive or military structures, and such as are apparently designed for sacrificial rites or religious ceremonies, are scarcely to be met with in the territory marked by those singular groups of imitative earthworks. The country, moreover, is well adapted for maintaining a large population, in very diverse stages of social progress. Through its gently undulating surface numerous rivers and streams flow in sluggish, yet limpid current, eastward and westward, to empty themselves into Lake Michigan or the Mississippi. The pools and groups of lakes into which they expand, furnish abundance of wild rice, which is at once a means of sustenance to numerous

aquatic birds, and also constituted an important source of supply to the aborigines, so long as they held possession of the territory. The rivers and lakes also abound with excellent fish; and where the soil remains uninvaded by the ploughshare of the intruding settler, numerous traces of older agricultural labour show where the Indians cultivated the maize, and developed some of the industrial arts of a settled people. Indian grave-mounds diversify the surface, and enclose ornaments and weapons of the rude nomads that still linger on the outskirts of that western state. But such slight and inartificial mounds are readily distinguishable from the remarkable structures of a remoter era which constitute the archæological characteristic of the region. Here, indeed, as elsewhere, the Indians have habitually selected the ancient earthworks as places of sepulture; and as a rule have given the preference to the larger and more conspicuous mounds. On some of these the surveyors recognised recent graves of the Potowattomies. But their irregular position shows that they bear no relation to the original design. In their superficial character they correspond to the slight grave-mounds made with the imperfect implements of the modern Indians; and they contrast in all other respects with the laborious construction of the gigantic animal-mounds.

The symbolic earthworks of the Wisconsin plains are not confined to the representation of animals, though the predominance of animal-mounds has suggested that name for the whole. Embankments occur in the form of crosses, crescents, angles, and straight lines; and also seemingly as gigantic representations of the war-club, tobacco-pipe, and other familiar implements or weapons. Some of the crosses and other simpler forms probably originally

represented animals, birds, or fishes, with extended wings or fins. But in those, as in the better-defined animal-mounds, time has obliterated the minuter touches of the ancient modeller, and effaced indications of his meaning. Yet fancy still recognises among the best preserved relievos the elk, buffalo, bear, fox, otter, and racoon. The lizard is of frequent occurrence; the turtle and frog also appear; birds and fishes are repeatedly represented; and man himself figures among the ancient relievos. Of one form of mound which Mr. Lapham identifies as the otter, seven examples occur. Sixteen cruciform earthworks are described, and the ordinary examples, of all sizes, are counted by hundreds.

It is not without reason that some of the larger mounds in the midst of those emblematic earthworks have been designated observatory mounds, and assumed to have been constructed in order to afford a view of the laborious devices. Ordinarily the mound builder is tempted to give greater prominence to his tumulus by erecting it on the summit of a hill or bluff; but on the prairie land of Wisconsin, such natural elevations are wanting; and hence the construction of a class of works for which the lowest levels were preferred. The “Big Elephant Mound,” which measures 135 feet in length, is constructed in a valley gently sloping to the Mississippi, a few miles below the junction of the Wisconsin River. The ridges on both sides offered a choice of elevated sites; but the bottom land nearly on a level with the Mississippi at high water, has been purposely chosen, so that the device might be surveyed from the neighbouring heights. Fancy is prompt to assign a meaning to the old modellers’ works. In this example, the prolonged snout, or proboscis, has led to its designation as the “Big Elephant Mound”; and

the delineator of it, in the Smithsonian Report for 1872, so confidently relies on its purposed significance that he asks: “Is not the existence of such a mound good evidence of the contemporaneous existence of the mastodon and the Mound-Builders?” The figure, though comparatively large, is surpassed by many. Some indeed are on a gigantic scale. One mound of peculiar, but indeterminate form, tapers for a length of five hundred and seventy feet. At its smaller extremity or tail, it slightly curves to the east. At the opposite extremity are a large cross, and one of the largest circular mounds. Its device can no longer be recognised; but much ingenuity and still more labour, have been expended on its construction. Another remarkable group in Dade County, includes six quadrupeds of indeterminate species, six parallelograms, a large tumulus, a circle, and a human figure. The animals are grouped in two rows; and the tumulus seems as though it had been erected as an observatory from which to view the elaborate design. An ingenious English critic recognises in it the possible memorial of a triumph like that of the ancient Greek charioteer in the national games, with the appropriate substitution of a sledge for the chariot, and a train of dogs for the fleet racers of the hippodrome. “Taking,” he says, “the rudeness of the age and workmanship into account, the impracticability of the material, and the scale and material, the whole is really not a bad representation of the dog-drawn sledges of the Kamschatdales of the present day. Supposing their horns to have been omitted, from the impracticability of raising earthworks that would stand well, and in proportion to represent them, they might have signified the elk or the reindeer. Whatever animal, however, be taken, it is perhaps a

legitimate inference that we have here the colossal trophy of a super-Atlantic charioteer at some American race; why not the curious hippodrome, or, more correctly here, cynodrome, with its starting-cells (carceres), its course, its meta, and road of triumph to the town?"[89]

It was not necessary for the fanciful interpreter to resort to remote Kamschatka for the model of his dog-drawn sledge, for such are common enough among the Indians of the North-west. But a general survey of the earthworks of Wisconsin in no degree tends to confirm this interpretation, unless in so far as such animal-mounds may have been monumental memorials, and trophies of achievements in wars and the chase. As such they are executed on a scale which gives evidence of the systematic expenditure of an enormous amount of labour; and as the opinion has latterly found favour with some that the great mounds are simply the result of many successive interments; and the marks of regular stratification in some of them have been adduced in confirmation of this idea: the corresponding proportions of the animal-mounds are significant. In them at least a preconceived design has guided the builders from the outset; and some adequate idea of the magnitude of the Dade County group will be formed from a correct estimate of the proportions of the supposed charioteer. He is figured, as is usual in similar mounds, with his limbs extended, and with arms of disproportionate length; possibly owing to the design originally representing some implement in each hand. From head to foot he measures one hundred and twenty-five feet, and one hundred and forty feet from the extremity of one arm to that of the other. The head alone is a mound twenty-five feet in diameter, and nearly six feet in highest elevation

from the surrounding soil. Measuring the whole by this scale, it is abundantly apparent that a group, including altogether fifteen mound-figures, must have been a work of immense time and labour, and doubtless owed its origin to some motive or purpose of corresponding magnitude in the estimation of its constructors.

Mr. Schoolcraft attempted to solve the mystery of the emblematic mounds by assuming them to be the Totems, or heraldic symbols, in use among the Indian tribes, thus reproduced in earthworks on a gigantic scale. The fox, the bear, the eagle, turtle, or other animal, is selected among them as the sign of the tribe or family. This usage prevailed among the Iroquois, Hurons, Algonquins, Cherokees, and other nations occupying very extensive areas; and, accordingly, guided by the superficial resemblance of the Animal Mounds to such totemic signs, Mr. Schoolcraft says: “A tribe could leave no more permanent trace of an esteemed sachem, or honoured individual, than by the erection of one of these monuments. They are clearly sepulchral, and have no other object but to preserve the names of distinguished actors in their history.”[90] But exploration seems to prove that the emblematical mounds of Wisconsin are not sepulchral; while any correspondence that may be traced between them and the totemic symbols of tribes once so widely spread as the Algonquins, Iroquois, and Cherokees, only increases the mystery of symbols constructed on this colossal scale, and confined to a territory so limited. So far indeed is a careful survey from confirming any such convenient and summary fancy, that Mr. Lapham states, as the result of elaborate explorations, that he conceives four epochs are traceable in the history of the locality, two of which

at least preceded the era of occupation by the Indian tribes. The period of the animal-mound builders strikingly contrasts with that of the earthworks previously described, in the rarity of enclosed works of art. But the few implements discovered are full of interest from their obvious resemblance to those of the Mound-Builders. Several of the large hornstone discs which I have seen are of the same type as those found in immense numbers in the Ohio Mounds; and Mr. Albert H. Hoy of Racine, Wisconsin, describes in a letter to me the discovery of about thirty of the same relics, in that vicinity, under circumstances suggestive of great antiquity. They lay at a depth of eight feet in undisturbed soil, under a thin bed of peat, in what appeared to have been the ancient bed of the Rock River.

The sites of the symbolic earthworks of Wisconsin correspond to those adopted by the Mound-Builders for their sacred enclosures; though others of their works, and especially the most remarkable of their animal-mounds, were constructed on prominent heights. Within the fertile region bounded by the great lakes and the Mississippi, a numerous population may have long dwelt undisturbed, in the enjoyment of the profusion which wood and water and the easily cultivated soil supplied. On the bluffs and terraces surmounting the rivers and lakes by which facilities of communication with the surrounding territory, and with more distant regions, were commanded, the earthworks are found in extensive and evidently dependent groups. But, unlike the rich memorial mounds of the Scioto Valley, they reveal few enclosed relics to chronicle the history of their erection, and throw light on the race of artists who laboriously diversified the natural landscape with such devices. In a few cases, human

remains have been found in them, under circumstances which did not clearly point to a modern date; but in summing up the results of his explorations, Mr. Lapham remarks:—"So far as I have had opportunity to observe, there are no original remains in the mounds of imitative form, beyond a few scattered fragments that may have gained a place there by accident. Many of the mounds have been entirely removed, including the earth beneath for a considerable depth, in the process of grading streets in Milwaukee; and it is usually found that the natural surface had not been disturbed at the time of the erection, but that the several layers or strata of mould, clay, gravel, etc., are continuous below the structure, as on the contiguous grounds. Great numbers of the smaller conical tumuli are also destitute of any remains; and if human bodies were ever buried under them, they are now so entirely 'returned to dust' that no apparent traces of them are left."[91]

The extensive works at Aztalan, on the west branch of Rock River, present analogies of a different kind from the sacred and civic enclosures of the Mound-Builders. They constitute, it is believed, the only ancient enclosure, properly so called, throughout the whole region of the emblematic mounds; and, under the name of the "ancient city of Aztalan," were long regarded as one of the wonders of the western world. Early explorers were on the look-out for the mother city of the Aztecs, and the first surveyor of the earthworks on Rock River named them Aztalan, in the full belief that the long-sought city of Mexican tradition had at length been found. The name was a stimulus to credulity and wonder; and proved the source of much extravagant exaggeration. Walls of brick still sustained by their

solid buttresses; a subterranean vault and stairway discovered within one of its square mounds; a subterranean passage, arched with stone; bastions of solid masonry, and other features of the like kind: were all made to correspond with the supposed mother-city of the Aztecs, and the cradle-land of America's native civilisation. On being subjected to accurate survey, those wondrous features vanish. Freed, however, from exaggeration and falsehood, the Aztalan works still present remarkable characteristics. An area of seventeen acres on the banks of the Rock River is enclosed on three sides by a vallum with regular "bastions," as they have been termed; although both the construction of the walls, and the site of the enclosure—commanded as it is by elevated land on nearly every side,—preclude the idea of its having been a place of defence. Large, square, terraced mounds occupy the northern and southern angles. In one of them a human skeleton was found; and in others of the mounds coarse pottery occurs; but both may have been deposited long subsequent to the completion of the earthworks of Aztalan. With these exceptions, nothing has yet rewarded the careful and elaborate excavations of its explorers tending to throw light on the original builders. Its bastions have been tunnelled in vain; and cuttings made in some of the largest of a remarkable range of tumuli outside the enclosures revealed only ashes, mingled with charcoal and fragments of human bones, unaccompanied by a single work of art, like those which confer so graphic an interest on the mounds of the Ohio Valley.

Assuming the works of Aztalan and the animal-mounds of Wisconsin to belong to the same period: Mr. Lapham assigns the conical mounds to a later era. These he regards as built for sepulchral

purposes, and exhibiting, both in construction and materials, the workmanship of a greatly inferior race of builders. Next come what are designated by the modern settlers “ancient garden beds,” consisting of low, broad, parallel ridges, as if corn had been planted in drills. They average four feet in width, and the depth of the space between them is six inches. These appearances indicate a more perfect system of agricultural operations than anything known to have been practised by the modern Indian tribes; but, at the same time, they are no less distinctly disconnected with the construction of the ancient mounds. Where these occur within a cultivated area, the parallel ridges of the old cultivators are carried across them in the same manner as over any other undulation of the ground. It is obvious, therefore, not only that the emblematic earthworks preceded them, but that they had neither sacredness nor any special significance in the eyes of the cultivators of the soil. Probably, indeed, such traces of agricultural operations belong to a greatly more modern period.

What, then, are the inferences to be drawn from the ancient monuments peculiar to the territory lying immediately to the south of the great copper region of Lake Superior? They are mostly of a negative character, yet not on that account without significance. If we assume the existence of contemporary nations in Wisconsin and the Ohio Valley in the period of the Mound-Builders, the chronicles of that era exhibit them to us in striking contrast. In the one region every convenient height is crowned with the elaborate fortifications of a numerous and warlike people; while, on the broad levels of the river-terraces, ingenious geometrical structures prove their skill and intellectual

development as applied to the formation of civic and temple enclosures. Their sacred and sepulchral mounds, in like manner, reveal considerable artistic skill, and a singular variety in the rites and customs exacted in the performance of their national worship. Turning to the northern area, all is changed. Along the river-terraces we look in vain for military structures. The mounds disclose no altars rich with the metallurgic or mimetic workmanship of their builders; but, on the contrary, the sole traces of imitative art occur in the external forms of earthworks, the exploration of which confutes the idea of their having been erected over either grave or altar, and reveals no other purpose of their construction.

When it is considered that, along with the mica of the Alleghanies, the shells of the Gulf of Mexico, and obsidian from the ancient centre of American civilisation, the copper of Lake Superior is one of the most abundant materials found in the Mississippi mounds: we are tempted to trace some intimate relation between the warlike occupants of the Ohio and Scioto valleys and the singular race who dwelt in peaceful industry on the well-watered and plentifully stocked plains to the south of the copper region, and there constructed their strange colossal memorials of imitative art. The country seems peculiarly adapted by nature as a central neutral land for the continent to the east of the Rocky Mountains. On the east it is guarded by Lake Michigan, and on the north by the great inland sea which constitutes the fountain of the whole lake and river chain that sweeps away on its course of twenty-five hundred miles, over Niagara, and through the islands and rapids of the St. Lawrence, to the Atlantic. On the west, with its infant streamlets originating almost from the same

source, the Mississippi rolls onward in its majestic course, receiving as its tributaries the great rivers which rise alike on the western slope of the Alleghanies and the eastern declivities of the Rocky Mountains, and loses itself at length in the Gulf of Mexico. This wonderful river system, and the great level contour of the regions which it drains, exercised a remarkable influence on the extinct civilisation of America, as well as on later Indian nomad life, making its primitive eras so different from any phase of Europe's history. The Indians who traded with Cartier at Tadousac, on the lower St. Lawrence, and those whom Raleigh met with on the coast of Carolina, obtained their copper from the same northern region towards which the head-waters of the Mississippi and the St. Lawrence converge; while the world of Europe between the Rhine and the Baltic remained, even in its late Roman era, almost as much apart from that on its Mediterranean shores as the America of centuries before Columbus. It seems, therefore, not inconceivable that the prairie land of Wisconsin derives some of its archæological characteristics from its relation to the physical geography of the region between the Rocky Mountains and the Atlantic, possibly as a sacred neutral ground attached to the metallurgic region of Lake Superior, like the famous pipe-stone quarry of the Couteau des Prairies.

This idea of some peculiar relations connecting the symbolic architects of Wisconsin with the Mound-Builders of the Ohio, derives confirmation from the few but remarkable animal-mounds of the latter, in which their connection with the religious rites of the ancient race is borne out. One example of an animal-mound, upwards of 250 feet in length, and probably designed to represent a bear, occupies a

high level terrace on the west bank of the Scioto river. Unlike any of the symbolic mounds of Wisconsin, it is surrounded by an oval embankment measuring four hundred and eighty feet in greatest diameter. On the south side a space of about ninety feet wide breaking the continuity of the embankment, is covered by a long exterior mound, leaving two avenues of approach where it overlaps the inner oval. This mound has not been opened; but in the process of excavating the Ohio canal, large quantities of mica, similar to what occurs so abundantly in the sacrificial mounds, were found in its immediate vicinity.

The same canal intersects Newark earthworks; and there, within another elliptic vallum, is the Eagle Mound, measuring 155 feet in length of body, and 200 feet between the tips of the wings. It is only a minor feature of the remarkable group, already described, which includes geometrical enclosures, mounds, and avenues; but it is distinguished from all the others, by the great scale of its enclosing walls, and interior ditch. Unfortunately it was opened by a former proprietor in search of treasure; and no further record of its contents has been preserved, except that it covered a hearth of a similar character to the altars already described as characteristic of the sacrificial mounds. The fact, however, illustrates the contrast between works bearing so much external resemblance to each other as the symbolic mounds of the Mississippi Valleys and those of Wisconsin. In the absence of all included relics of worship or inhumation, the latter seem but as symbols of the rites practised by the southern Mound-Builders.

About six miles higher up the same valley, the “Alligator,” of Licking County, attracts attention as another remarkable colossal animal-mound. It

occupies the summit of a lofty hill or spur, which projects into the Racoon Creek Valley. The outline and general contour of this huge lizard-mound are still clearly defined, though agricultural operations have obliterated some of the minuter traces noted by early visitors. The average height is four feet; but the head, shoulders, and rump, are elevated in parts to a height of fully six feet. The tail curls off to the left side, and is now so indefinite, as it tapers towards a point, that the precise measurement is uncertain; but the total length of the "Alligator" may be stated at about 220 feet. Excavations made at various points have only shown that the figure has been modelled in fine clay upon a framework of stones of considerable size. But when I visited it, a rain gully had exposed part of the side of the hill, showing this to consist to a large extent of loose stones; so that the mound is no doubt constructed with materials obtained on the spot. A raised circular structure, designated the altar, and covered with stones which had been much exposed to the action of fire, is described by former observers as standing on the right side, and connected with the summit of the mound by a graded way ten feet broad; but the traces of this feature are now very slight.

The site of this remarkable monument commands a view of the entire valley for eight or ten miles, and is by far the most conspicuous point within that limit. An ancient fortified hill stands about three-fourths of a mile distant on a spur of the same range of heights; and another entrenched hill nearly faces it on the opposite side of the valley. Numerous mounds occupy both the hill-tops and the levels in surrounding valleys; and it is only the luxuriant growth of the forest which conceals the great Newark group, with its geometrical enclosures,

parallels, and mounds. The Alligator Mound may, therefore, be assumed to symbolise some object of special awe or veneration, thus reared on one of the chief high-places of the nation, where the ancient people of the valley could witness the celebration of rites of their unknown worship. Its site was obviously selected as the most prominent natural feature in a populous district abounding with military, civic, and religious structures. Yet its imposing proportions are surpassed by another symbolic work constructed on a height remote from any traces of ancient settlement.

The Great Serpent of Adam's County, Ohio, occupies the extreme point of a crescent-formed spur of land formed at the junction of two tributary streams of the Ohio. This elevated site has been cut to a conformity with an oval circumvallation on its summit, leaving a smooth external platform ten feet wide, with an inclination towards the embankment on every side. Immediately outside the inner point of this oval is the serpent's head, with distended jaws, as if in the act of swallowing what, in comparison with its huge dimensions, is spoken of as an egg, though it measures 160 feet in length. Conforming to the summit of the hill, the body of the serpent winds back, in graceful undulations, terminating with a triple coil at the tail. The figure is boldly defined, the earth-wrought relievo being upwards of five feet in height by thirty feet in base at the centre of the body; and the entire length, following its convolutions, cannot measure less than a thousand feet.

This singular monument stands alone, and though classed here with the symbolic animal-mounds of Wisconsin, it has no analogue among the numerous basso-relievos wrought on the broad prairie-lands of that region. It is indeed altogether unique among the

earthworks of the New World, and without a parallel in the Old; though it has not unnaturally furnished the starting-point for a host of speculations relative to serpent-worship. Among the miniature sculptures of the Mound-Builders, repeated examples of the serpent occur. On one of the altars of “Mound City” was a pipe of the form peculiar to the mounds, with a rattlesnake coiled round the bowl. From another mound of the same earthwork several sculptured tablets were recovered, representing the rattlesnake, delicately carved in fine cinnamon-coloured sandstone; and one of them carefully enveloped in sheets of copper. The character of these sculptures, and the circumstances under which they were discovered, suggested to the explorers that they were not designed for ornaments; but had some relation to superstitious rites. Other serpents are represented by the Mound-Sculptors; but the rattlesnake is the favourite type. I recently examined, in the Peabody Museum of Archæology at Cambridge, Mass., a series of eighteen engraved circular plates made from the shell of the *Pyrula*, which were obtained from the Brakebill and Lick Creek Mounds, in East Tennessee. Thirteen of them bear the same device of a rattlesnake. Among the Mexicans it was the symbol of royalty; and this helps to give a special interest to a remarkable tablet figured here, in the same style of art, so suggestive of Mexican affinities. It is a disk of fine-grained sandstone, nearly 8½ inches in diameter, and three-quarters of an inch, thick, on which is graven the elaborate device of two intertwined rattlesnakes, as shown in Fig. 73. On the back a slight ornament runs round the border; and a fractured mortice-hole, somewhat out of the true centre, shows where a handle has been attached to it. It was found in two pieces, near Lake Washington,

Issaquina County, Mississippi; and is now in the possession of Mr. W. Marshall Anderson, of Circleville, Ohio.



FIG. 73.—Lake Washington Disk.

The imitative mounds of Wisconsin hitherto described are in bold relief; but on the Indian Prairie, a few miles from the city of Milwaukee, there occur five designs, wrought—to use a term of European art, —in intaglio. Instead of the representations of animals being executed in relief, the process has been reversed, and the outline has been completed by piling the excavated earth round the edge. A few similar examples have been noted at other points; but such a process is more liable to effacement in the progress of time, unless renewed like the famous "White Horse" of Berkshire, by a periodical "scouring." The chalk hills of southern England present peculiar facilities for effective colossal intaglio work. Another White Horse, ascribed to Saxon victors of the Danes, accompanies a group of British earthworks on Braddon Hill, Wiltshire; and the colossal human figure, armed with a club, at Cerne, in Dorsetshire, preserves a still closer counterpart to those scattered over the prairie lands beyond the western shores of Lake Michigan.

But for our present purpose the comparison of these ancient earthworks with others clearly

traceable to modern Indian tribes, is more important than any analogies between the antiquities of the two hemispheres. One fact of obvious significance is the great scale on which the prehistoric races of America wrought, and the consequent evidences of numbers, and of combined labour perseveringly applied to the accomplishment of their aim. It is difficult to convey any definite conception of this by mere description, even though accompanied with minute measurements. A single cruciform mound measures four hundred and twenty feet between the extreme points of its limbs. Lizard and other animal-mounds ranging from eighty to a hundred and fifty feet in length occur in extensive groups; and by their systematic arrangement, impress the mind with the idea of protracted toil carried on under the control of some supreme rule, or stimulated by motives of paramount influence. The Indian tribes that have come under observation are as diverse in habits, arts, and religious rites as in language; but none of them have manifested any capacity for the combination involved in the construction of monuments which more nearly resemble the great embankments and viaducts of modern railway engineering. The extent of such works indicates a settled condition of society, and industry far beyond that of the Iroquois Confederacy. In all this there may be nothing absolutely incompatible with the idea of the Indians being degenerate descendants of such a people, yet it is unsupported by proof. No modern tribe preserves any traces of such ancestral constructive habits; and while the animal-mounds appear to be regarded with superstitious reverence by the Indians, and are rarely disturbed except for purposes of sepulture, they lay no claim to them as the work of their fathers. The only theory of their origin is, that they are the work

of the great Manitou, and were made by him to reveal to his red children the plentiful supply of game that awaits them in the world of spirits. The idea is a consoling one to tribes whose hunting-grounds have been invaded and laid desolate; and it is fully as philosophical as a theory gravely propounded to the American Scientific Association, that the cruciform and curvilinear earthworks intermingled with the animal-mounds include characters of the Phœnician alphabet, and are half-obliterated inscriptions commemorative of explorations by the great voyagers of antiquity.

What then are the inferences thus far deducible as to the races of Northern America in ante-Columbian centuries? Assuming a community of arts, and certain intimate relations in race and social condition, among the ancient people who worked the mines on Lake Superior, and constructed the varied earthworks that reach southward into Indiana, Ohio, and Kentucky: there is no reason to suppose that they were united as one nation. While coincidences of a remarkable kind in the construction, and still more in the dimensions of their great earthworks, point to a common knowledge of geometrical configuration, and a standard of measurement: no two earthworks so entirely correspond as to show an absolute identity of purpose. The marked diversity between the truncated, pyramidal mounds of the states on the Gulf, the geometrical enclosures of Ohio, and the symbolic earthworks of Wisconsin, indicate varied usages of distinct communities. A dense population must have centred in certain favourite localities, still marked by evidence of the combined labours of a numerous people; and some supreme rule, like that of the Incas of Peru, must have regulated the operations requisite for the

execution of works planned on so comprehensive a scale.

The Scioto and the Ohio valleys, it may be presumed, were the seats of separate states, with frontier populations living in part on the produce of the chase; but depending largely on agricultural industry for the sustenance of the communities crowded on the flats and river-valleys where their monuments abound, and for the supply of the workmen by whose combined labour they were constructed. The religious character and uses ascribed to one important class of their earthworks, in which scientific skill is most clearly manifested, points to the probable existence of a sacerdotal order, such as played an important part in the polity both of Mexico and Peru. There is indeed so great a discrepancy between the remarkable combination of science and skill in the execution of the Ohio earthworks, and the crude state of the arts otherwise associated with them, as to suggest the idea of a sacerdotal caste, like the Brahmins of India, distinct in race, and superior in intellectual acquirements to the great mass of the people.

Of the physical characteristics of the Mound-Builders, notwithstanding the ransacking of many sepulchral mounds, we possess as yet very partial evidence. This department of the subject will come under review in a subsequent chapter; and it will then be seen that while the accepted Mound-Builders' type of head has been largely based on the very specimen selected by Dr. Morton, as "the perfect type of Indian conformation," with its undoubted traces of compression, and of the use of the cradle-board, so characteristic of the Indian hunter: it seems not improbable that a systematic exploration of the mounds may disclose evidence of a ruling class

differing physically as well as intellectually from the mass of the community by whose toil the enduring monuments of their singular rites and customs have been perpetuated.

But, while the Mound-Builders are essentially prehistoric, according to all New World chronology, there is nothing in the disclosures hitherto made calculated to suggest for them an extremely remote era. The marvellous traces of geometrical skill in their great earthworks, more than anything else, separate them from every known race north of Mexico. The indications of antiquity in the mines of Lake Superior, and the mounds of Ohio, suggest no such enormous intervals of time as perplex us in attempting to deal with the relics of the caves and river-valleys of Europe. The refilled trenches on the barren rocks of Isle Royale manifestly demand centuries for the slow accumulation of sufficient soil and vegetable matter to refill the excavations. Dr. Hildreth ascribes eight hundred years of growth to a tree felled on one of the mounds at Marietta; and other trustworthy authorities, including Messrs. Squier and Davis, furnish similar evidence for lesser periods of four, five, and six centuries. The longest term thus indicated would be little enough for the filling up of the deserted trenches of Isle Royal. But however far back we carry the era of the Mound-Builders, the chief change which the regions occupied by them have since undergone, is the clothing of their valleys, and the earthworks erected there, with the forests which help us to some partial guess at the intervening centuries since their disappearance. The animal remains hitherto found in their mounds are those of the existing species of deer, bears, wolves, and other fauna, not even now wholly extirpated from Ohio; and while their

ingenious sculptures prove that they were familiar with a more southern, and even a South-American tropical fauna: nothing has yet been discovered to connect them with an extinct, much less a fossil mammalia, such as the mastodon. The probability rather is that the ruins of Clark's Work, or Fort Ancient, may match in antiquity with those of England's Norman keeps, and even that their builders may have lingered on into centuries nearer the age of Columbus.

The Zuñi, Moquis, Pimos, and other tribes of New Mexico, have left curious evidences of a people of gentle skill in agriculture, in ceramic art, and above all, in architecture, beyond anything pertaining to the northern Indians, or even in some respects to the Mound-Builders. But there still remains the distinct and perplexing element of a people so partially civilised, and comparatively rude; yet able to construct squares, circles, ellipses, and other geometrical figures on a seale which would tax the skill of many a well-trained civil engineer of the present day.

Other characteristic traits of the Mound-Builders, especially as shown in their ingenious sculptures, and illustrated by their mimetic art, have yet to be considered. But this at least is apparent, that the most advanced among the Indian tribes of North America within its historical period represent a phase of life essentially inferior to that which had preceded it. Before the great river-valleys were overshadowed with their ancient forests, nations dwelt there practising arts and rites which involved many germs of civilisation. Their defensive military skill, their agricultural industry, and even their ideas of the relations of man to some supreme spiritual power, are suggested by evidence, which, though inadequate

for any detailed chronicle, discloses glimpses of an unwritten history full of interest even in this tantalising form. We have still to consider other characteristics of the ancient race, including their geographical and ethnical relations. But before doing so, it is desirable to review the history of other ancient American races among whom civilisation attained a higher development, and of whom we have historical evidence, as well as the chronicles which archæology supplies.

[89] *Journ. Brit. Archæol. Ass.* vol. v. p. 411.

[90] *History of Indian Tribes*, vol. i. p. 52.

[91] *Antiquities of Wisconsin*, p. 80.

CHAPTER XIV.

NATIVE AMERICAN CIVILISATION.

THE TOLTECS—IXTLILXOCHITL—THE AZTECS—AMERICAN ARCHITECTURE—AZTALAN—THE VALLEY OF MEXICO—MONTEZUMA'S CAPITAL—ITS VANISHED SPLENDOUR—MEXICAN CALENDAR—THE CALENDAR STONE—MEXICAN DEITIES—TOLTEC CIVILISATION—RACE ELEMENTS—THE TOLTEC CAPITAL—TEZCUCAN PALACES—THEIR MODERN VESTIGES—QUETZALCOATL—THE PYRAMID OF CHOLULA—THE SACRED CITY—THE MOQUI INDIANS—THE HOLY CITY OF PERU—WORSHIP OF THE SUN—ASTRONOMICAL KNOWLEDGE—AGRICULTURE—THE LLAMA—WOVEN TEXTURES—SCIENCE AND ART—NATIVE INSTITUTIONS—METALLURGY—ORIGIN OF THE MEXICANS—MINGLING OF RACES.

The Toltecs play a part in the initial pages of the New World's story akin to the fabled Cyclops of antiquity. They belong to that vague era which lies beyond all definite records, and furnish a name for the historian and the ethnologist alike to conjure with: like the Druids or the Picts of the old British antiquary, or the Phœnicians of his American disciple. Yet it is not without its value thus to discover among the nations of the New World, even a fabulous history, with its possible fragments of truth embodied in the myth. Mr. Gallatin has

compiled a laborious digest of the successive migrations and dynasties of Mexico, as chronicled from elder sources, by Ixtlilxochitl, Sahagun, Veytia, Clavigero, the Mendoza Collection, the Codex Tellurianus, and Acosta.[92] The oldest dates bring the Toltec wanderers to Huehuetlapallan, A.D. 387, and close their dynasty in the middle of the tenth century; when they are superseded by Chichimecas and Tezcucans, whose joint sovereignty, by the unanimous concurrence of authorities, endured till the sixteenth century. But, meanwhile, the same authorities chronicle the foundation of Mexico or Tenochtitlan, variously in the thirteenth or fourteenth century, by Aztec conquerors; and profess to supply the dynastic chronology of Aztec power. The earliest date is not too remote for the commencement of a civilisation that has left such evidences of its later maturity; but unfortunately the various authorities differ not by years only, but by centuries. Ixtlilxochitl carries back the founding of Mexico upwards of a century farther than any other authority; and in the succeeding date, which professes to fix the election of its king, Acamapichtli, the discrepancies between him and other authorities vary from two to considerably more than two and a half centuries, and leave on the mind of the critical student impressions as unsubstantial as those pertaining to the regal dynasties of Alban and Sabine Rome. Spanish chroniclers and modern historians have striven to piece into coherent details the successive migrations into the Vale of Anahuac, and the desertion of the mythic Aztalan for the final seat of Aztec empire on the lake of Tezcuco; but their shadowy history marshals before us only shapes vague as the legends of the engulfed Atlantis.

There is something suggestive of doubt relative to

much else that is greatly more modern, to find the historian of the Conquest of Mexico tracing down the migrations and conquests of the Toltecs from the seventh till the twelfth century, when the Acolhuans or Tezcucans, the Aztecs, and others, superseded them in the Great Valley. We turn to the foot-notes, so abundant in the carefully elaborated narrative of Prescott, and we find his chief or sole authority is the christianised half-breed Don Fernando de Alva, or Ixtlilxochitl, who held the office of Indian interpreter of the Viceroyalty of New Spain in the beginning of the seventeenth century. Compared with such an authority, Bede should be indisputable as to the details of Hengist and Horsa's migrations, and Geoffrey of Monmouth may be quoted implicitly for the history of Arthur's reign.

But the Aztecs, at any rate, are no mythic or fabulous race. The conquest of their land belongs to the glories of Charles V., and is contemporary with what Europe reckons as part of its modern history. The letters of its conqueror are still extant; the gossiping yet graphic marvels of his campaigns, ascribed to the pen of Bernal Diaz, a soldier of the Conquest, have been diligently ransacked for collation and supplementary detail; and the ecclesiastical chroniclers of Mexican conquest and colonisation, have all contributed to the materials out of which Prescott has woven his fascinating picture of Hernando Cortes and his great life-work. It is a marvellous historical panorama, glittering with a splendour as of the mosques and palaces of Old Granada. But a growing inclination is felt to test the Spanish chroniclers by surviving relics of that past which they have clothed for us in more than oriental magnificence; and, for this purpose, to relume that curious phase of native civilisation which the

Conquest abruptly ended. Yucatan and Central America still reveal indisputable memorials of an era of native architectural skill, to which attention must be directed. But, meanwhile, it is important to note that an assumed correspondence between the architecture of Central America and that which is affirmed to have existed in Mexico at the time of the Conquest constitutes the basis of many fallacious arguments on the nature and extent of Aztec civilisation in the era of the second Montezuma. Again, the conflicting elements apparent between the barbarous rites and cannibalism ascribed to the Aztecs, and the evidences of their matured arts and high civilisation, have been the plentiful source of theories as to Toltecan and other earlier derivations for all that pertained to such manifestations of intellect and inventive genius. It is important, therefore, to determine the actual character of Mexican architecture. The remains of the extinct Mound-Builders are full of wonder for us; but the reputed magnificence of Montezuma's capital throws their earthworks into the shade, as things pertaining to America's childhood. Before, however, this conclusion can be accepted, it is indispensable that we test, by existing evidence, the descriptions of Mexican art and architecture handed down to us by chroniclers of the sixteenth and seventeenth centuries.

A peculiar style is recognised as pertaining to the native architecture of America, which it has been the favourite fancy of American antiquaries to trace to an Egyptian or Phœnician source. Alike in general character and mode of construction, in the style of sculpture, and the hieroglyphic decorations which enrich their walls: the ruined palaces and temples of Mexico, as well as of Yucatan and Central America,

have been supposed to reproduce striking characteristics of the Nile valley. But the experienced eye of Stephens saw only elements of contrast instead of comparison; and while Prescott sums up his history of Mexican conquest with this conclusion, “that the coincidences are sufficiently strong to authorise a belief that the civilisation of Anahuac was, in some degree, influenced by that of eastern Asia,” he adds, that the discrepancies are such as to carry back the communication to a period so remote as to leave its civilisation, in all its essential features, peculiar and indigenous.

It is not always easy to determine the characteristics of some of the most famous monuments of Mexican art. The ruined city of Aztalan, on the western prairies: after filling the imagination with glowing fancies of a Baalbek or Palmyra of the New World, from whence the Aztecs had transplanted the arts of an obliterated civilisation to the Mexican plateau, shrunk before the gaze of a truthful surveyor into a mere group of mounds and earthworks, presenting no other analogies than those which class them with the works of the American Mound-Builders. It may be, however, that a critical survey will reveal traits in the later Aztecs of Anahuac, rendering such an ancestral birth-land not wholly inconsistent with their actual condition when brought into contact with the civilisation of Europe. Such at least seems to be the tendency of modern disclosures; if, indeed, they do not point to the possibility that much even of the latest phase of Mexican civilisation may present closer analogies to the actual Aztalan of the Wisconsin prairies than to the fancied mother-city of the Aztecs.

Midway across the continent of North America,

where it narrows towards a point between the Gulf of Mexico and the Pacific, the civilisation of the New World appears to have converged at the close of the fifteenth century. Here the traveller from the Atlantic coast, after passing through gorgeous tropical flowers and aromatic shrubs of the deadly *tierra caliente*, emerges at length into a purer atmosphere. The vanilla, the indigo, and flowering cacao-groves are gradually left behind. The sugar-cane and the banana next disappear; and he looks down through the gorges of the elevated *tierra templada* on the vegetation of the tropics, carpeting, and scenting with its luscious but deadly odours, the region which stretches along the Mexican Gulf. Higher still are regions where the wheat and other grains of Europe's temperate zone replace the tall native maize; until at length he enters the *tierra fria*: climbing a succession of terraces representing every zone of temperature, till he rests on the summit of the Cordillera. Beyond this the volcanic peaks of the Andes tower into the regions of perpetual snow; while the traveller crosses the once thickly-wooded table-land into the valley of Mexico: an oval basin about sixty-seven leagues in circumference, and elevated beyond the deadly malaria and enervating heat of the coast, into a temperate climate, nearly seven thousand five hundred feet above the sea. Here, encompassed by the salt marshes of the Tezcucan Lake, stood the ancient Tenochtitlan or Mexico, "The Venice of the Aztecs."

In the month of October 1519, Don Diego de Ordaz effected the ascent of the volcanic Popocatepetl, from whence he beheld the valley of Mexico with its curious chain of lakes; and caught a glimpse of the far-famed capital of Montezuma, with its white towers and pyramidal teocallis reflecting

back the sun from their stuccoed walls. The scene seemed to realise such a dream of romance as Bernal Diaz reports of Cempoal: “The Buildings,” he says, “having been lately whitewashed and plastered, one of our horsemen was so struck with the splendour of their appearance in the sun, that he came back in full speed to Cortes to tell him that the walls of the houses were of silver!” The men of that generation which witnessed the discoveries of mighty empires, and an El Dorado beyond the known limits of the world, had their imaginations expanded to the reception of any conceivable wonders. Sir Thomas More constructed his *Utopia* out of such materials; and Othello styles his wonderful relations “of antres vast and deserts idle,” a “traveller’s history.”

The poetical imagination of Columbus was one of the sources of his power, whereby he anticipated with undoubting faith the realisation of his grand life-work. But from the position in which Cortes was placed, it was his interest to give currency to the highly-coloured visions of his first pioneers, rather than to transmit to Europe the colder narrative of matured experience. Approaching the Mexican capital, he exclaims in his first burst of enthusiasm: “We could compare it to nothing but the enchanted scenes we had read of in *Amadis de Gaul*, from the great towers and temples, and other edifices of lime and stone which seemed to rise up out of the water.” To achieve the recognised mastery of this scene of enchantment, he had not only to conquer its Mexican lords, but to defeat his Spanish foes, and to win to his side that Emperor who, while shaping Europe’s history in one of its mightiest revolutions, could control the destinies of the New World. When reading the accounts transmitted to Spain of the gorgeous treasures of Montezuma’s palaces, we have

to bear in remembrance that the treasures themselves perished in the retreat of the *noche triste*, as the city itself vanished in the final siege and capture. The very dreams of an excited imagination could become realities of the past to the narrators themselves, when every test of their truth had been swept away.

On the 9th of November 1519, Cortes made his first entry into the capital of Montezuma, and from thence he wrote to the Emperor Charles V., giving an account of the Indian metropolis, with its palaces and stately mansions, far surpassing in grandeur and beauty the ancient Moorish capital of Cordova. Conduits of solid masonry supplied the city with water, and furnished means of maintaining hanging-gardens luxurious as those of ancient Babylon. "There is one place," says Cortes, "somewhat inferior to the rest, attached to which is a beautiful garden with balconies extending over it, supported by marble columns, and having a floor formed of jasper elegantly inlaid"; and he adds, "Within the city, the palaces of the cacique Montezuma are so wonderful that it is hardly possible to describe their beauty and extent. I can only say that in Spain there is nothing equal to them." The population of ancient Mexico, "the greatest and noblest city of the whole New World," as Cortes styles it, amounted, according to the lowest computation of its conquerors, to three hundred thousand; and its streets and canals were illuminated at night by the blaze from the altars of numberless teocallis that reared their pyramidal summits in the streets and squares of what Prescott fitly calls "this city of enchantment." Vast causeways, defended by drawbridges, and wide enough for ten or twelve horsemen to ride abreast, attracted the admiring wonder of the Spaniards by the skill and

geometrical precision with which they were constructed. “The great street facing the southern causeway was wide, and extended some miles in nearly a straight line through the centre of the city. A spectator standing at one end of it, as his eye ranged along the deep vista of temples, terraces, and gardens, might clearly discern the other, with the blue mountains in the distance, which, in the transparent atmosphere of the table-land, seemed almost in contact with the buildings.”[93] Near the centre of the city rose a huge pyramidal pile, dedicated to the war-god of the Aztecs, the tutelary deity of the city: second in size only to the great pyramid-temple of Cholula, and occupying the area on which now stands the Cathedral of modern Mexico. Beyond the Lake of Tezcuco stood the rival capital of that name, resplendent with a corresponding grandeur and magnificence; and the whole Mexican valley burst on the eyes of the conquerors as a beautiful vision, glittering with towns and villages, with rich gardens, and broad lakes crowded with the canoes of a thriving and busy populace.

Three centuries and a half have intervened since Cortes entered the gorgeous capital of Montezuma; and what remains now of its ancient splendour, of the wonders of its palaces, the massive grandeur of its temples, or the cyclopean solidity of its conduits and causeways? Literally, not a vestige. The city of Constantine has preserved, in spite of all the destructive vicissitudes of siege and overthrow, enduring memorials of the grandeur that pertained to the Byzantine capital more than a thousand years ago. Rome has been sacked by Goth, Hun, Lombard, and Frank; yet memorials not only of three or four centuries, but of generations before the Christian era,

survive. Even Jerusalem appears to have some stones of her ancient walls still left one upon another. In spite, therefore, of the narrative of desolating erasure which describes to us the final siege and capture of Mexico, we must assume its edifices and causeways to have been for the most part more slight and fragile than the description of its conquerors implies, or some evidences of such extensive and solid masonry must have survived to our time. Yet if we look in vain for its architectural remains, evidence of another kind shows what its civilisation really was. Mr. Tylor describes the ploughed fields around it as yielding such abundance of obsidian arrow-heads, pottery, and clay figures, that it is impossible to tread on any spot where there is no relic of old Mexico within reach. He left England full of doubts as to the credibility of the historians of the conquest; but personal observation inclines him rather "to blame the chroniclers for having had no eyes for the wonderful things that surrounded them."[94]

One trustworthy memorial of this native civilisation is the famous Calendar Stone: a huge circular block of dark porphyry, disinterred in 1790 in the great square of Mexico, which discloses evidence of progress in astronomical science altogether wonderful in a people among whom civilisation was in other respects so partially developed. The Mexicans had a solar year of 365 days divided into eighteen months of twenty days each, with the five complementary days added to the last. The discrepancy between the actual time of the sun's annual path through the heavens and their imperfect year, was regulated by the intercalation of thirteen days at the end of every fifty-second year. According to Gama, who differs from Humboldt on this point, the civil day was divided into sixteen

parts; and he conceives the Calendar to have been constructed as a vertical sundial. Mexican drawings also indicate that the Aztecs were acquainted with the cause of eclipses. But beyond this our means of ascertaining the extent of their astronomical knowledge fail; while there is proof that their inquiries were zealously directed to the more favoured speculations of the astrologer, which have supplanted true science in all primitive stages of society. Mr. Stephens drew attention to



FIG. 74.—Mask, Mexican Calendar Stone.

points of correspondence between the central device on the Calendar Stone, and a mask, with widely expanded eyes and tongue hanging out, prominent in the curious sacrificial scene sculptured on the Casa de Piedra at Palenque. But the correspondence amounts to little more than this, that each is a gigantic mask with protruding tongue. That of the Calendar Stone is engraved here from a cast brought home by Mr. Bullock, and now in the Collection of the Society of Antiquaries of Scotland. The statues dug up along with it on the site of the great teocalli of Mexico, were buried in the court of the University, to place them beyond reach of the idolatrous rites which the Indians were inclined to pay to them. At the solicitation of Mr. Bullock they were again disinterred, to admit of his obtaining casts; and he

furnishes this interesting account of the sensation excited by the restoration to light of the largest and most celebrated of the Mexican deities:—"During the time it was exposed, the court of the University was crowded with people, most of whom expressed the most decided anger and contempt. Not so, however, all the Indians. I attentively marked their countenances. Not a smile escaped them, or even a word. All was silence and attention. In reply to a joke of one of the students, an old Indian remarked, 'It is very true we have three very good Spanish gods, but we might still have been allowed to keep a few of those of our ancestors!' And I was informed that chaplets of flowers had been placed on the figure by natives who had stolen thither unseen in the evening."[95]



FIG. 75.—Ticul Hieroglyphic Vase.

The figure which thus reawakened patriotic sympathies in the descendants of Montezuma's subjects is a rude disproportioned idol, strikingly contrasting with the elaborate hieroglyphical devices and well-proportioned figures and decorations which accompany the grotesque mask in the Casa de Piedra of Palenque. In the latter, the principal human figures present the remarkable profile of the ancient Central American race, as shown on a vase dug up among the ruins of Ticul (Fig. 75), with the prominent nose, retreating forehead and chin, and

protruding under-lip, so essentially different from the features either of the Mexicans or northern Indians. The subject race on whom they tread are characterised by a diverse profile, with overhanging brows, a Roman nose, and a well-defined chin; while their costume is equally indicative of a different origin.

But the sculpture of the Mexican Calendar Stone embodies evidence of an amount of knowledge and skill not less interesting for us than the mysterious hieroglyphics of the Palenque tablets; and was believed by Humboldt to indicate unmistakable relations to the ancient science of south-eastern Asia. Mr. Stephens has printed a curious exposition of the chronology of Yucatan, derived from native sources by Don Juan Pio Perez. From the correspondence of their mode of computing time with that adopted by the Mexicans, he assumes that it probably originated with them; but at the same time he remarks that the inhabitants of Mayapan, as the Peninsula was called at the period of Spanish invasion, divided time by calculating it almost in the same manner as their ancestors the Toltecs, differing only in the particular arrangement of their great cycles. Their year commenced on the 16th of July, an error of only forty-eight hours in advance of the precise day in which the sun returns there to the zenith, on his way to the south, and sufficiently near for astronomers who had to make their observations with the naked eye. Their calendar thus presents evidence of native and local origin. According to Humboldt, the Mexican year began in the corresponding winter half of the year, ranging from the 9th to the 28th of January; but Clavigero places its commencement from the 14th to the 26th of February.

If my ideas as to a marked inferiority in the terra-

cottas and sculptures of the Mexicans, and the very questionable proofs of their architectural achievements, are correct, they tend to confirm the inference, that not to the Aztecs, but to their more civilised Toltec predecessors, must be ascribed that remarkable astronomical knowledge in the arrangement of their calendar, which exhibits a precision in the adjustment of civil to solar time, such as only a few of the most civilised nations of the Old World had attained to at that date. But, so far as an indigenous American civilisation is concerned, it matters little whether it be ascribed to Toltec or Aztec origin. Of its existence no doubt can be entertained; and there is little more room for questioning, that among races who had carried civilisation so far, there existed the capacity for its further development, independently of all borrowed aid. The fierce Dane and Norman seemed to offer equally little promise of intellectual progress in their first encroachments on the insular Saxon. But out of such elements sprung the race which outstripped the Spaniard in making of the land of Columbus a New World; and, left to its own natural progress, the valley of Anahuac, with its mingling races, might have proved a source of intellectual life to the whole continent. But modern Mexico has displaced the ancient capital of Montezuma; cathedral, convents, and churches, have usurped the sites of Aztec teocallis; its canals have disappeared, and its famous causeways are no longer laved by the waters of the Tezcucan Lake. It is even denied by those who have personally surveyed the site, that the waters of the lake can ever have overflowed the marshes around the modern capital, or stood at a much nearer point to it than they do at present.[96] Fresh doubts seem to accumulate around its mythic story. The ruined

masonry of its vanished palaces and temples may be assumed to have been all swallowed up in the edifices which combine to make of the modern capital so striking an object, amid the strange scenery of its elevated tropical valley. But Mexico was not the only city, nor even the only great capital, of the valley.

In attempting to trace back the history of the remarkable population found in occupation of the Mexican territory when first invaded by the Spaniards, we learn, by means of various sources of information already referred to, but chiefly on the authority of Ixtlilxochitl's professed interpretations of picture-writings, no longer in existence; and of traditions of old men, concerning events reaching back from seven or eight, even to twelve centuries before their own time: that the Toltecs, advancing from some unknown region of the north, entered the territory of Anahuac, "probably before the close of the seventh century." They were, according to their historian, already skilled in agriculture and the mechanical arts, familiar with metallurgy, and endowed with all the knowledge and experience out of which grew the civilisation of Anahuac in later ages. In the time of the Conquest, extensive ruins are said to have indicated the site of their ancient capital of Tula, to the north of the Mexican valley. The tradition of such ruined cities adds confirmation to the inferences derived from those more recently explored in regions to the south; and still the name of Toltec in New Spain is synonymous with *architect*: the mythic designation of a shadowy race, such as glances fitfully across the first chapters of legendary history among the most ancient nations of Europe. But subsequent to those Pelasgi of the New World, there followed from unknown regions of the north

the Chichimecas, the Tepanecs, the Acolhuans or Tezcucans, the Aztecs of Mexicans, and other inferior tribes; so that, as we approach a more definite period of history, we learn of a league between the States of Mexico and Tezcuco and the kingdom of Tlacopan, under which the Aztec capital grew into the marvellous city of temples and palaces described by Cortes and his followers. But Don Fernando de Alva claimed descent on his mother's side from the Imperial race of Tezcuco; and he has not failed to preserve, or to create the memorials of the glory of that imperial city of the laguna. It contained upwards of four hundred stately edifices for the nobles. The magnificent palace of the Tezcucan emperor "extended from east to west, twelve hundred and thirty-four yards, and, from north to south, nine hundred and seventy-eight. It was encompassed by a wall of unburnt bricks and cement, six feet wide and nine high for one-half of the circumference, and fifteen feet high for the other half. Within this enclosure were two courts. The outer one was used as the great market-place of the city, and continued to be so until long after the Conquest. The interior court was surrounded by the council-chambers and halls of justice. There were also accommodation there for foreign ambassadors; and a spacious saloon, with apartments opening into it, for men of science and poets, who pursued their studies in this retreat, or met together to hold converse under its marble porticoes."[97] In this style the native historian describes the glory of ancient Tezcuco. A lordly pile, provided for the fitting accommodation of the sovereigns of Mexico and Tlacopan, contained three hundred apartments, including some fifty yards square. Solid materials of stone and marble were liberally employed both on this and on the

apartments of the royal harem, the walls of which were incrusted with alabasters and richly tinted stucco, or hung with gorgeous tapestries of variegated feather-work. Some two leagues distant, at Tezcotzinco, was the favourite residence of the sovereign; on a hill, "laid out in terraces, or hanging-gardens, having a flight of five hundred and twenty steps, many of them hewn in the natural porphyry. In the garden on the summit was a reservoir of water, fed by an aqueduct carried over hill and valley for several miles on huge buttresses of masonry. A large rock stood in the midst of this basin, sculptured with hieroglyphics representing the years of Nezahualcoyotl's reign, and his principal achievements in each. On a lower level were three other reservoirs, in each of which stood a marble statue of a woman, emblematic of the three estates of the empire. Another tank contained a winged lion,"—but here the modern historian grows incredulous, and appends a (?) before proceeding in accordance with his authorities to add—"cut out of the solid rock, bearing in his mouth the portrait of the emperor."

The authority for all this wrote in the beginning of the seventeenth century; but his narrative receives some confirmation from architectural remains still visible on the hill of Tezcotzinco. They are referred to by Latrobe and Bullock as relics of an era greatly more remote than that of Aztec civilisation; and more recently Mr. Tylor describes the hill of Tezcotzinco as terraced, and traversed by numerous roads and flights of steps cut in the rock. It is connected with another hill by an aqueduct of immense size constructed with blocks of porphyry, and with its channel lined with a hard stucco, still very perfect. Baths also remain, cut out of the solid

rock; and on the summit of the hill, overlooking the ancient city, sculptured blocks of stone furnish evidence that the tales of architectural magnificence are not wholly fabulous. Mr. Christy, his travelling companion, made excavations in the neighbouring mounds, and was rewarded by the discovery of some fine idols of hard stone, and "an infinitude of pottery and small objects." But the spirit of Spanish romance still asserts its influence. Bullock, in his *Six Months in Mexico*, describes the remains of the royal fountain of Tezcotzinco as a "beautiful basin, twelve feet long by eight wide, having a well five feet by four deep in the centre"; while Latrobe, in his *Rambles in Mexico*, reduces the dimensions of the royal bath to "perhaps two feet and a half in diameter, not large enough for any monarch bigger than Oberon to take a duck in!"

Of the great pyramid or teocalli of Huitzilopotchtli in old Mexico, no vestige now remains, unless such as is reputed to lie buried under the foundations of the cathedral which occupies its site. But time and fate have dealt more tenderly with the scarcely less famous pyramid of Cholula. The ancient city of that name, when first seen by Cortes, was said to include, within and without its walls, about forty thousand houses, or according to ordinary rules of computation, two hundred thousand inhabitants. But whatever its ancient population may have been, while the fruits of Spanish conquest have advanced it to the rank of capital of the republic of Cholula, they have left only sixteen thousand as the number of its occupants. Still, Cholula was unquestionably one of the most famous of the cities of the New World: a sacred Mecca for the pilgrims of Anahuac.

Quetzalcoatl, the milder god of the Aztec pantheon, whose worship was performed by offerings

of fruits and flowers in their season, was venerated as the divine teacher of the arts of peace. His reign on earth was the golden age of Anahuac, when its people learned from him agriculture, metallurgy, and the art of government. But their benefactor, according to the tradition handed down to the Aztecs by an elder people whom they had superseded, incurred the wrath of another of the gods. As he passed on his way to abandon the land to the rule of the terrible Huitzilopotchtli, he paused at the city of Cholula; and while he tarried there, the great teocalli was reared and dedicated to his worship. But the benevolent deity could not remain within reach of the avenger. After spending twenty years among them, teaching the people the arts of civilisation, he proceeded onward till he reached the ocean; and there embarking in a vessel, made of serpents' skins, his followers watched his retreating bark on its way to the sacred isle of Tlapallan. But the tradition lived on among the Mexicans that the bark of the good deity would revisit their shores; and this fondly cherished belief materially contributed to the success of the Spaniards, when their huge-winged ships bore the beings of another world to the mainland of the Mexican Gulf. The legend bears all the marks of anciently derived hero-worship, in which love for a lost benefactor framed for itself a deified embodiment of his virtues. This, however, is important to note, that Aztec traditions assigned the pyramid of Cholula to an older race and era than their own. It was there when they entered the plateau; and the arts of the divine metallurgist were taught, not to them but to the Toltecs, whom they superseded. Nevertheless, the deity shared in their worship; his image occupied a shrine on the summit of the pyramid of Cholula when the Spaniards first

visited the holy city; and the undying flame flung its radiance far into the night, to keep alive the memory of the good deity, who was one day to return and restore the golden age.

The present appearance of the great teocalli very partially justifies the reference made by Prescott to it as “that tremendous mound on which the traveller still gazes with admiration as the most colossal fabric in New Spain, rivalling in dimensions, and somewhat resembling in form, the pyramidal structures of ancient Egypt.” If it ever was a terraced pyramid, time and the elements have nearly effaced the traces of its original outline. On the authority of Humboldt, it is described as a pyramidal mound of stone and earth, deeply incrusted with alternate strata of brick and clay, which “had the form of the Mexican teocallis, that of a truncated pyramid facing with its four sides the cardinal points, and divided by the same number of terraces.” But the *adobe* of the Mexican, which is frequently styled brick, is nothing more than a mass of unbaked clay, or even mud. If such, therefore, is the supposed brick which alternated with the other materials of the mound, we can the more readily reconcile the seeming contradictions of observers. One of the latest thus describes the impression produced on his mind: “Right before me, as I rode along, was a mass of trees, of evergreen foliage, presenting indistinctly the outline of a pyramid, which ran up to the height of about two hundred feet, and was crowned by an old stone church, and surmounted by a tall steeple. It was the most attractive object in the plain; it had such a look of uncultivated nature in the midst of grain fields. It would have lost half its attractiveness had it been the stiff and clumsy thing which the picture represents it to be.” It is accordingly

described by Mr. R. A. Wilson, in his *Mexico and its Religion*, as no more than "the finest Indian mound on this continent," rising to a height of about two hundred feet, and crowned by an old stone church. But careful examination satisfied Mr. Tylor that it still retains the traces of a terraced teocalli. The church on its summit, dedicated to Our Lady *de los Remedios*, is served by a priest of the blood of the Cholulans; and the masonry and architectural skill which it displays have no doubt somewhat to do with their absence elsewhere; for if the clergy found the teocalli cased like the pyramidal terraces of Central America, with cut stone steps and facings, there can be little doubt they would go no further for a quarry for their intended church.

To the north of the Mexican valley ancient ruins arrest the gaze of the traveller, onward even to California. On the Rio Colorado and its tributaries, ruins of great extent, surveyed by recent exploring parties, are described as built with large stones, nicely wrought, and accurately squared. But nothing in their style of architecture suggests a common origin with the ruins of Mexico or Central America. They are large and plain structures, with massive walls, evidently built for defence, and with no traces of the ornamentation which abounds on the ruins of Yucatan. The Moqui Indians, the supposed remnant of the ancient builders, still construct their dwellings of stone with considerable art and skill. They are a gentle and intelligent race, small of stature, with fine black hair; and differ essentially from the Indians of the North-west. Their villages are included in one common stone structure, generally of a quadrangular form, with solid, unpierced walls externally, and accessible only by means of a ladder. These hive-like colonies are usually placed, for further defence, on

the summits of the lofty plateaus, which in the region of New Mexico are detached by the broad cañons with which that remarkable region is intersected. By such means this ingenious people seek protection from the wild tribes with which they are surrounded. Thus permanently settled, while exposed to the assaults of marauders, the Moquis cultivate the soil, raise corn, beans, cotton, and more recently vegetables derived from intercourse with the Mexicans. They have also their flocks of sheep and goats; and weave their dyed wools into a variety of substantial and handsome dresses. But only a small remnant now survives, occupying seven villages on the range of the Rio del Norte.[98]

Throughout New California ruined structures of stone, and sometimes of clay abound. The *Casas grandes*, as they are called, appear to have been defensive structures like the Moqui villages. Captain Johnston describes one, called the Casa de Montezuma, on the river Gila, which measured fifty feet by forty, and had been form storeys high. It is indeed worthy of note that while we find throughout the continent, from the Rocky Mountains to the Atlantic, scarcely a vestige of ante-Columbian stone architecture: traces of it increase upon us with every new exploration of the country that lies between the Rocky Mountains and the Pacific, and merges towards the south into the seats of ancient native civilisation and matured architectural skill.

But the Southern Continent had also its seat of a remarkable native civilisation; which, like that of Mexico, derived some of its most striking characteristics from the physical aspects of the country in which it originated. The peculiar natural advantages of Peru resulted from the settlement of a people on the lofty plateaus of the Andes, but within

the tropics, where at each successive elevation a different climate was secured. Such products as the mercantile navies of Northern Europe gather from many distant shores, were there brought within the compass of an industrious population: who fed their flocks on the cold crests of the sierra; cultivated their gardens and orchards on its higher plateaus; and gathered the luxuriant products of the tropics from the country that for them lay, for the most part, beneath the clouds, and spread away from the lowest slopes of the Andes to the neighbouring shores of the Pacific. The character of the people, and the nature of the civilisation of this remarkable country, presented many striking contrasts to the customs and institutions of the Mexicans, and they have generally been assumed as of totally independent origin.

Peru has her historic traditions, no less than Mexico; and her native historian, Garcilasso de la Vega, a descendant, through his mother, from the royal line of the Incas: who plays for them the part which Fernando de Alva did for his Tezcucan ancestry. Seen through such a medium, the traditions of the Inca race expand into gorgeous pages of romance; and the institutions of European chivalry and medieval polity are grafted on the strange usages of an Indian nation, remarkable for its own well-matured commonwealth, and unique phases of native-born civilisation. Sabaism constituted the essential element of Peruvian religious faith, and gave form and colour to the national rites and traditions. Manco Capac and Mama Oello Huaco, their mythic instructors in the arts of agriculture, weaving, and spinning, were the Children of the Sun; their high religious festivals were determined by the solstices and equinoxes; and Quito, the holy city, which lay immediately under the Equator, had

within it the pillar of the sun, where its vertical rays threw no shadow at noon, and they believed the god of light to seat himself in full effulgence in his temple. The sacred pillar stood in the centre of a circle described within the court of the great temple, traversed by a diameter drawn from east to west, by means of which the period of the equinoxes was determined; and both then, and at the solstices, the pillar was hung with garlands, and offerings of fruit and flowers were made to the divine luminary and parent of mankind. The title of the sovereign Inca was the Child of the Sun; and the territory of the empire was divided into three portions, of which one, constituting the lands of the Sun, maintained the costly ceremonial of public worship, with the temples and their numerous priests and vestal virgins. The national traditions pointed to the Valley of Cuzco as the original seat of native civilisation. There their mythic Manco Capac founded the city of that name; on the highlands around it a number of columns were reared which served for taking azimuths, and by measuring their shadows the precise time of the solstices were determined.

Besides the divine honours paid to the sun, the Peruvians worshipped the host of heaven, and dedicated temples to the thunder and lightning, and to the rainbow, as the wrathful and benign messengers of the supreme solar deity. It might naturally be anticipated that a nation thus devoted to astronomical observations, and maintaining a sacred caste exclusively for watching solar and stellar phenomena, would have attained to considerable knowledge in that branch of science. Apparently, however, the facilities which their equatorial position afforded for determining the few indispensable periods in their calendar, removed the

stimulus to further progress; and not only do we find them surpassed in this respect by the Muyscas, occupying a part of the same great southern plateau, who regulated their calendar on a system presenting considerable points of resemblance to that of the Aztecs; but they remained to the last in ignorance of the true causes of eclipses, and regarded such phenomena with the same superstitious and apprehensive wonder as has affected the untutored savage mind in all ages. One historian, indeed, affirms that they recognised the actual length of the solar year, and regulated their chronology by a series of cycles of decades of years, centuries, and decades of centuries, the last of which constituted the grand cycle or great year of the sun.[99] This is only confuted by a reference to the silence of earlier authorities, and the absence of all evidence on the subject; and may serve to remind us how partial is the knowledge we possess of the intellectual development of this singularly interesting people, among whom science was essentially esoteric.

Prescott seeks to account for the very imperfect nature of the astronomical science of Peru, by the fact, that the Peruvian priesthood were drawn exclusively from the body of the Incas: a privileged order of nobility who claimed divine origin, and were the less tempted to seek in superior learning the exclusive rights of an intellectual aristocracy. But other reasons help to explain this singular intellectual condition of a nation, which had in so many other directions made remarkable progress in civilisation. The very fact that astronomy constituted, as it were, the national religion, placed it beyond the reach of scientific speculation, among a people with whom blasphemy against the sun, and malediction of the Inca, were alike punished with death. The

impediments to Galileo's astronomical discoveries were trifling compared with those which must have beset the presumptuous Inca priest who ventured to deny the diurnal revolution of the sun round the earth; or to explain, by the simple interposition of the moon between themselves and the sun, the mysterious and malign infirmities with which it constituted a part of the national creed to believe their supreme deity was afflicted during a solar eclipse. But another cause also tended to retard the progress of the Peruvians in the intelligent solution of astronomical phenomena. Among the ancient Egyptians we find the division of the year determined by the changes of the Nile; and their year regulated by applications of astronomical science, minutely interwoven with their sacred and civil institutions. But the phenomena of the seasons, which have fostered with every other civilised nation the accurate observation of the astronomical divisions of time, and the determination of the recurring festivals dependent on seed-time and harvest, were almost inoperative, where, among a people specially devoted to agriculture, each season and every temperature could be commanded by a mere change of elevation under the vertical sun of the equator.

The Peruvians, however, must be tried by their own standards of excellence. Manco Capac, their mythic civiliser, was no war-god, like the Mexitli of the ferocious Aztecs. Agriculture was the special art introduced by him; and husbandry was pursued among them on principles which modern science has only recently fully developed in Europe. There alone, in all the New World, the plough was in use; and the Inca himself, on one of the great annual festivals, consecrated the labours of the husbandman by

turning up the earth with a golden ploughshare. Artificial irrigation was carried out on a gigantic scale by means of aqueducts and tunnels of great extent, the ruins of which still attest the engineering skill of their constructors. The virtues of *guano*, which are now so well appreciated by the agriculturists of Europe, were familiar to the Peruvian farmer; and as the country of the Incas included, at its various levels, nearly all varieties of climate and production, from the cocoa and palm that fringed the borders of the Pacific, to the pasture of their mountain flocks on the verge of the high regions of perpetual snow: a systematic succession of public fairs, regulated, like all else, by the supreme government, afforded abundant opportunities for the interchange of their diverse commodities.

Such a country, if any, could dispense with commerce, and attain to considerable advancement without a representative currency or circulating medium. Gold, which was so abundant, served only for barbaric pomp and decoration. Silver was accessible in such quantities, that Pizarro found in it a substitute for iron to shoe the horses of his cavalry. Copper and tin in like manner abounded in the mountains; and the Peruvians had learned to alloy the copper both with tin and silver, for greater utility in its application to the useful arts. Bartholomew Ruiz, it will be remembered, found on board the *balsa* first met by him off the Peruvian coast, a pair of balances for weighing the precious metals; and the repeated discovery of well-adjusted silver balances in tombs of the Incas, confirms the evidence that they made use of weights in determining the value of their commodities. The Peruvians were thus in possession of a mode of exchange, which, for their purposes, was superior to that of the currency of the

Mexicans, in the absence of any such means of ascertaining the exact apportionment of commodities produced for sale.

Progress in agriculture was accompanied by a corresponding development of the resources of a pastoral people. Vast flocks of sheep ranged the mountain pastures of the Andes, under the guidance of native shepherds; while the Peruvians alone, of all the races of the New World, had attained to that important stage in civilisation which precedes the employment of machinery, by their use of the lower animals in economising human labour. The llama, trained as a beast of burden, carried its light load along the steep paths of the Cordilleras, or on the great highways of Peru.



FIG. 76.—Peruvian Web.

As the mythic Manco Capac was the instructor of the nation in agriculture, so also the divine daughter of the Sun introduced the arts of weaving and spinning. Such traditions serve at least to indicate the favourite directions of the national taste and skill, which were displayed in the manufacture of a variety of woollen articles of ingenious patterns and the utmost delicacy of texture. Numerous examples of the woven textures of the Peruvians have been recovered from their ancient graves at Atacama and elsewhere; though it cannot be assumed that in these

we have specimens of the rare and costly fabrics which excited the wondering admiration of the early Spaniards. In the arid soil and tropical climate of the great desert of Atacama, articles which prove the most perishable in northern latitudes are found, after the lapse of centuries, in perfect preservation. Of these I had an opportunity of examining a collection recovered by Mr. J. H. Blake from ancient huacas explored by him, and now preserved in his cabinet at Boston. They include specimens of cloth, wrought in dyed woollen thread, and sewed in regular and ornamental designs. Each piece is woven of the exact size which was required for the purpose in view, and some of them furnish proofs of ingenious skill in the art of weaving. The threads consist of two or more strands of dyed llama-wool twisted together; and elaborate patterns are woven into a soft and delicate web. The accompanying figure, though grotesque, is a good specimen of a complicated feat achieved in dyed woollen threads on the ancient Peruvian loom. It was found in a grave at Atacama, along with many other relics described in a subsequent chapter. Mr. Blake remarks, in reference to the discoveries of this class which rewarded his researches:—"In forming an opinion of the degree of skill displayed in the arts of spinning and weaving, by these specimens, it should be borne in mind that the implements in use were of the simplest contrivance. The only ones which have been discovered are simple distaffs; and among the articles obtained from the Atacama graves were several formed of wood and stone, such as are still in use among the Indians of Peru at the present day. Weaving on the loom has not been introduced among them. The warp is secured by stakes driven into the ground, and the filling-in is inserted by the slow process of passing it by hand over and under

each thread alternately." It would be a grave error, however, to assume that we possess in such relics, recovered from the ordinary graves formed in the loose sand of the desert, the highest achievements of Peruvian skill. On the contrary, regarding them, as we must, as fair specimens of the common woollen tissues of the country, they confirm the probability that the costly hangings, and beautifully wrought robes of the Inca and his nobles, fully justified the admiration with which they are referred to by Spanish writers of the sixteenth century.

Marvellous specimens of ceramic art are also noted among the manufactures ascribed to the Peruvians before the conquest, surpassing anything found in the common cemeteries of the race; but the proofs which exist of the ingenuity expended by the ancient potter on utensils in daily use, render probable the accounts of such rare *chef-d'œuvres* executed by their cunningest workmen for the imperial service. So also we read of animals and plants wrought with wonderful delicacy, in gold and silver; and scattered with profuse magnificence about the apartments of the Peruvian nobles. Such specimens of goldsmiths' work no longer survive; but still the huacas of the ancient race are ransacked for golden ornaments, which prove considerable metallurgic skill, and leave no room to doubt that gold and silver were moulded and graven into many ingenious forms. Science and art had indeed made wonderful advances among this remarkable people; though with them, as with the Chinese, they were more frequently expended in the gratification of a craving for display, than in realising triumphs of much practical value. Nevertheless, Peruvian civilisation had wrought out for itself many elements of progress adapted to its native soil. Its astronomical

science admits, indeed, of no comparison with that of Mexico; and in lieu of the artistic picture-writing of the Mexicans, it employed the quipus, an artificial system of mnemonics not greatly superior to the Red Indian wampum, to which it bears considerable resemblance. In this it contrasts with the matured hieroglyphical inscriptions of Central America and Yucatan, which preserve evidences of progress in advance of the highest civilisation of the Aztecs and the Incas, and indeed of all but the most civilised nations of ancient or modern centuries. But this higher phase of intellectual development must be reserved for consideration in its relations to the psychology of the whole continent.

The remarkable system of national polity doubtless originated in part from the docile nature still manifested by the descendants of the Peruvian people; and, when viewed in this connection, it furnishes some key to the peculiar characteristics of their civilisation. Their government was a sacerdotal sovereignty, with an hereditary aristocracy, and a system of castes more absolute seemingly than that of the Egyptians or Hindus. Something of the partial and unprogressive development of the Chinese mingled in the ancient Peruvians along with numerous other traits of resemblance to that singular people. Unlike the Mexicans, we see in their whole polity, arts, and social life, institutions of indigenous growth. It would be difficult to limit the centuries during which such a people may have handed on from generation to generation the slowly brightening torch. Their own traditions, preserved with the help of quipus and national ballads, are valueless on this point. But their institutions reveal some remarkable evidences of a people preserving many traits of social infancy, alongside of such matured arts and habits as

could only grow up together around the undisturbed graves of many generations. Offerings of fruits and flowers took the place of the bloody human sacrifices of Aztec worship; but the suttee rites, which disclose their traces everywhere in the sepulchral usages of primitive nations, were retained in full force. The simple solidity of megalithic art gave an equally primitive character to their architecture, notwithstanding its application to many practical purposes of life; and the precious metals, though existing in unequalled profusion, were retained to the last solely for their contribution to barbaric splendour. The habits of pastoral life, by means of which the foremost nations of the Old World appear to have emerged out of barbarism, were with them modified by the haunts of flocks peculiar to the strange region of mountain and plateau, where also they carried the next step in human progression, that of agriculture, to a degree of perfection probably never surpassed. They had advanced metallurgy through all its stages, up to that which preceded the use of iron; and with the help of their metal tools, displayed a remarkable skill in many mechanical arts. They did no more, because, under their peculiar local circumstances and the repressive influences of the mild despotism of Inca rule, they had achieved all that they required.

A gentle people found abundant occupation in tilling the soil, without being oppressed by a labour which was lightened by the frequently recurring festivals of a joyous, and, in some respects, elevating national faith. Nor is it difficult to conceive of such a people continuing to pursue the even tenor of their way, with scarcely perceptible progression, through all the subsequent centuries since their discovery to Europe: had not the hand of the conqueror ruthlessly

overthrown the structure reared by many generations, and quenched the lamp of native civilisation. The conquerors of the sixteenth century have given expression to the astonishment with which they beheld everywhere evidences of order, contentment, and prosperity; and while the architectural magnificence of Montezuma's capital has so utterly disappeared as to suggest the doubt if it ever existed: the traveller along the ancient routes of Peruvian industry still sees on every hand ruins, not only of temples, palaces, and strongholds, but of terraced declivities, military roads, causeways, aqueducts, and other public works, that astonish him by the solidity of their construction and the grandeur of their design. But between these two great divisions of the western hemisphere, in the curiously insulated region of Central America, traces of ancient civilisation abound, with evidences of a higher, if not longer enduring development than either. The closing annals both of Mexico and Peru have acquired a vivid interest from the incidents of Spanish conquest; and retain many romantic associations connected with the lustre of their conquerors. But the interest which attaches to Central America and Yucatan derives little value from history. There, under the luxuriant forests of that tropical region, may still be studied the monuments of a lettered people, and the sculptures and symbolic inscriptions of an extinct faith, amid ruins which appear to have been already abandoned to decay before Cortes explored the peninsula in his lust of conquest. Their basso-relievos preserve the physiognomy of a race essentially diverse from the Mexicans; and their sculptured hieroglyphics show a process of inscription very far in advance of the picture-writing of the Aztecs. The magnitude and

solidity of the ruins of Peru still attest the practical aim of works wrought there on a grand scale, and for purposes of more obvious utility than those of the Central American peninsula; and the characteristics of some of the Peruvian crania suggest striking analogies with the peculiar physiognomy of the northern basso-relievos, such as are no longer recognisable when we turn to the Mexican race.

Nothing pertaining to the northern continent east of the Rocky Mountains presents any counterpart to Peruvian architecture, sculpture, or the ingenious modelling of the potter's art; or suggests affinities in language or astronomical science, to Peru or Central America; unless it be the remarkable remains of the Mound-Builders. But with Mexico it is otherwise. In the region between the Rocky Mountains and the Atlantic the stock is to be sought, from which on many grounds it appears most reasonable to trace the predominant Mexican race of the era of the Conquest. They were inheritors, not originators of the civilisation of the plateau. But while the traditions of the Aztecs appear to point to a migration from the north, the Toltecs whom they displaced can be assigned on no tangible evidence to a similar origin. Amid many diversities recognisable among the nations of the New World, the forest and prairie tribes, now clustering chiefly in the North-west, are the representatives of one great subdivision, the source of which may be sought in that northern hive stretching westward towards Behring Strait and the Aleutian Islands, with possible indications of an Asiatic origin. But for the more intellectual nations whose ancient monuments lie to the south of the Rio Grande del Norte, the most probable source appears to be the southern plateaus of the Peruvian Cordilleras. In the copper regions of

the north the abundant metal supplied all wants too readily to stimulate to further progress; but the southern region rises through every change of climate under the vertical rays of the equator; and its rocky steeps are veined with exhaustless treasures of metallic ores, in such a condition as to lead man on step by step from the infantile perception of the native metal as a ductile stone, to the matured intelligence of the metallurgist, mingling and fusing the contiguous ores into his most convenient and useful alloys. A branch of the same race, moving northward along the isthmus, may account for the abundant architectural remains of the central peninsula, consistently with its ethnographic traces; while beyond this, to the northward, we see in the conflicting elements of Mexican civilisation, the confluence of races from north and south, and the mingling of their diverse arts and customs under the favouring influences which the vale of Anahuac supplied.

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[92] *American Ethnological Society's Transactions*, vol. i. p. 162.

[93] Prescott's *Conquest of Mexico*, B. III. ch. ix.

[94] *Anahuac*, p. 147.

[95] Bullock's *Six Months in Mexico*, p. 111.

[96] Topographical View of the Valley, Wilson's *New History of Mexico*, p. 452.

[97] Prescott's *Conquest of Mexico*, B. I. chap. vi.

[98] Dr. Latham speaks of the Moquis as a people that "no living writer seems to have seen."—*Varieties of Man*, p. 394. But the above information communicated to me by Professor Newberry, is the result of his own personal observations. He showed me also specimens of their woven dresses, manifesting considerable skill, and exhibiting great taste in the arrangement of their bright colours. They have recently been greatly reduced by small-pox.

[99] Montesino's *Mém. Antiquas MS.*, lib. ii. cap. 7; cited by Prescott.

CHAPTER XV.

ART CHRONICLINGS.

IMITATIVE SKILL—ARCHAIC EUROPEAN ART—CONVENTIONAL ORNAMENTATION—IMITATIVE DESIGN—ANALOGIES IN RITES AND CUSTOMS—ALTAR RECORDS—SMELTING THE ORES—WISCONSIN PRAIRIE LANDS—THE RACE OF THE MOUNDS—MOUND CARVINGS—PORTRAIT-SCULPTURES—AMERICAN ICONOGRAPHY—DEDUCTIONS—NON-INDIAN TYPE—OTHER EXAMPLES—ANTIQUE ICONOGRAPHIC ART—PECULIAR IMITATIVE SKILL—ANIMALS REPRESENTED—EXTENSIVE GEOGRAPHICAL RELATIONS—KNOWLEDGE OF TROPICAL FAUNA—DEDUCTIONS—THE TOUCAN AND MANATEE—TRACES OF MIGRATION—ASSUMED INDICATIONS—ANALOGOUS SCULPTURES—PERUVIAN IMITATIVE SKILL—CARVED STONE MORTARS—NICOTIAN RELIGIOUS RITES—INDIAN LEGENDS—THE RED PIPE-STONE QUARRY—THE LEAPING ROCK—MANDAN TRADITIONS—SIOUX LEGEND OF

THE PEACE PIPE—THE SACKED COCA PLANT—KNISTENEAUX LEGEND OF THE DELUGE—INDICATIONS OF FORMER MIGRATIONS—FAVOURITE MATERIAL—PWAHGUNEKA—CHIMPSEYAN CUSTOMS—CHIMPSEYAN ART—BABEEN CARVING—THE MEDICINE PIPE-STEM—INDIAN EXPIATORY SACRIFICES—NICOTIAN RITES OF DIVINATION.

In studying the elaborate sculptures of Central American architecture, one of the first of its peculiar characteristics to strike the eye is the predominance of representations of natural objects, alike in its decorative details and in the symbolism of its hieroglyphic tablets. The human form, the head, the heart, the skull, the hand and foot, along with familiar objects of animate and inanimate nature, supplied the readiest architectural devices, and the most suggestive signs for attributes and ideas. In the imitation involved in such a style of art, resemblances may be traced to the productions of many partially civilised nations both of ancient and modern times. But in reviewing the primitive art of the New World, whether pertaining to extinct nations, like the Mound-Builders of Ohio and the architects of Yucatan, or to Indian tribes still occupying their old hunting grounds, the critical observer can scarcely overlook many peculiar manifestations of imitative skill. Though by no means to be regarded as an exclusive distinction of the American races, this is a characteristic in which they present a striking contrast to the primitive races of Europe. Many of the implements and personal ornaments of the ante-Christian era of European art, designated the “Bronze Period,” are exceedingly graceful in form, and some of them highly ornamented, but there is rarely a trace of imitative design. So also, though the peculiar form of one primitive class of gold ornaments, found in the British Isles, has suggested a name derived from the

calyx of a flower, which the cups of its rings seem in some degree to resemble, it is a mere fanciful analogy; for no example bears the slightest trace of ornament calculated to suggest that such similarity was present to the mind of the ancient goldsmith. Where incised or graven ornaments are wrought upon the flower-like forms, they are the same chevron, or herring-bone and saltire patterns, which occur on the rudest clay pottery, alike of northern Europe and of America: though executed on the finer gold work with considerable delicacy and taste.

The correspondence between the forms and ornamentation of the rudest classes of pottery of the Old and New World, appears, at first sight, remarkable; but it originates in the inartistic simplicity inseparable from all infantile art. The ornamentation is only an improvement on the accidents of manufacture. The first decorations of the aboriginal potters of Europe and America appear to have been an undesigned result of the twisted cords passed round the clay to retain its form before it was hardened in the fire. More complicated patterns were produced by plaited or knitted cords, or imitated in ruder fashion with the point of a bone-lance or bodkin. But it is only among the allophylian arts of Europe that such arbitrary patterns are perpetuated with improving taste and skill. The European vase and cinerary urn become more graceful in contour, and more delicate in material and construction, when they accompany the beautiful weapons and personal ornaments wrought in bronze. But no attempt is made to imitate leaf or flower, bird, beast, or any simple natural object; and when in the bronze work of the later Iron Period, imitative forms at length appear, they are chiefly the snake and dragon patterns, borrowed seemingly by Celtic and Teutonic

wanderers, with the wild fancies of their mythology, from the eastern cradle-land of their birth.

This absence of every trace of imitation in the forms and decorations of the archaic art of northern Europe, is curious and noteworthy: for remarkable traces, already referred to, pertaining to its palæotechnic era, prove that it is by no means an invariable characteristic of primitive art. In the simplest forms of ancient weapons, implements, and pottery, mere utility was the aim. The rude savage, whether of Europe or America, had neither leisure nor thought to spare for decorative art. His æsthetic faculty had not begun to influence his constructive instincts. Art was the child of necessity, and borrowed its first adjuncts of adornment from the sources whence it had received its convenient but arbitrary forms. But the moment we get beyond this utilitarian stage, the contrast between the products of European and American art is exceedingly striking; and their value to the ethnologist and archæologist becomes great, from the insight they give into the aspects of mental expression, and the intellectual phases of social life, among unhistoric generations. The useful arts of the British allophylian progressed until they superinduced the decorative and fine arts. But the ornamentation was inventive, and not imitative; it was arbitrary, conventional, and singularly persistent in style. It wrought itself into all his external expressions of thought; and whatever his religious worship may have been, we look in vain for proofs of idolatry, among the innumerable relics which have been recovered from supposed Druidical fanes, or the older cromlechs and tumuli of the British Isles.[100] The very opposite characteristics meet the eye the moment we turn to the primitive arts of the New World. There, indications of

imitative design meet us on every hand. The rude tribes of the North-west, though living in the simplest condition of savage life, not only copy the familiar animal and vegetable forms with which they are surrounded: but represent, with ingenious skill, novel objects of European art introduced to their notice. Even their plaited and woven grass and quill-work assume a pictorial aspect; and the pottery is not only ornamented with patterns derived from flowers and other natural objects, but more elaborated examples are occasionally moulded into the forms of animals. Still more is this the case with the tubes, masks, personal ornaments, and, above all, the pipe-heads, alike of the Mound-Builders, and of living races. Nor does it stop with such miniature productions of art. The same imitative faculty reappears in the great earthworks of Wisconsin and Ohio: where the artist has wrought out representations of natural objects on a colossal scale.

The chronicles recorded by such means are invaluable. The walls of Central American ruins are covered with voiceless hieroglyphics; and the costly folios of Lord Kingsborough's *Mexican Antiquities* have placed at the command of the scholars of both hemispheres the dubious ideography of native historians. But the artistic representations preserved alike in the bas-reliefs and statues of Palenque, or in the characteristic pipe-sculpture of the Ohio mounds, are as significant and easy of interpretation as those on the Ramesian tablets of Abbosimbul in Nubia, which demonstrate the existence, in the era of Rameses, of Semitic and Ethiopian races, with ethnical diversities as clearly defined as now.

Among the characteristics of ancient and modern nations discernible in peculiar rites and customs, or disclosed in their arts, there are some that indicate

widely-diffused hereditary influences, and so furnish a clew to remote affinities of race. The practice of circumcision, for example, which prevails both in Asia and Africa, wherever the influence of Semitic nations can be traced, strikingly illustrates the value of such indices. Another ancient custom, that of systematic cranial distortion, was common to nations of both hemispheres, and is proved by the evidence of ancient sculpture to have been in use at the period of highest architectural art in Central America. The Indian war-trophy of the scalp, and its singular counterpart, the peace-pipe, are also significant usages of the New World; though the former appears to have been equally common among ancient Asiatic nations. Herodotus refers to scalping as one of the most characteristic war-customs of the Scythians, and to their hanging the scalp-trophies to the warrior's bridle-rein. Hence the ἀποσκυθίζειν of Euripides, quoted by Rawlinson, when remarking on the resemblance of such ancient customs to those of the Red Indians. The correspondence is worthy of note, in connection with others afterwards referred to, as possibly indicative of something more than a mere American counterpart to Egyptian and Oriental accumulations of trophies of the slain—the skulls, the hands, the ears, or even the foreskins,—repeatedly referred to in the Old Testament Scriptures, and recorded with minute detail on the paintings of Egypt, and the sculptures of Nimroud and Khorsabad. But no such analogies throw light on the singular usage of the peace-pipe. The ethnical relations which it indicates belong exclusively to the New World, where it seems to perpetuate a significant symbolism derived from an extinct native civilisation. As such, it is worthy of study by the American ethnologist, as the most curious of the

many practices connected with the use of the strange nicotian stimulant. The pipe appears to have been associated with solemn religious rites and civic ceremonials, both in ancient and modern times. It bore a prominent part in the worship of the old Mound-Builders; and still retains its place among the paraphernalia of the inspired medicine-man or priest, and the most sacred credentials of the ambassador or war-chief.

The implements designed for the use of tobacco or other narcotic herbs, occupy a prominent place among the works of art of which the sacrificial mounds are the principal depositories. In accordance with the almost universal custom of barbarous and semi-civilised nations, the Mound-Builders devoted to their dead whatever had been most prized in life, or was deemed valuable for some talismanic charm. Hence the Mississippi mounds, and the ancient tombs of Mexico and Peru, disclose the same kind of evidence of the past as Wilkinson has deduced from the catacombs of Egypt, or Dennis from the sepulchres of Etruria. But in addition to this, the remarkable religious rites of the American Mound-Builders have preserved not only their altars, but the offerings laid upon them. The perishable garments of the dead have necessarily disappeared; and of instruments or utensils of wood or other combustible materials it is vain to expect a trace, where even metal has melted, and the stone been calcined in the blaze of sacrificial fires; but articles of copper and stone, of fictile ware, and even of shell, ivory, and bone, have escaped the destructive flame, and withstood the action of time. In such enduring characters inscriptions are legibly graven upon the altars of the Mound-Builders. Let us try to translate their records into the language of modern thought.

What such relics record in reference to metallurgy has already been seen. The Mound-Builders were acquainted with several of the metals. They had both the silver and lead of Iowa and Wisconsin in use. Implements and personal ornaments of copper abound on their altars; and the mechanical combination of silver with the native copper of which those are made, indicates that they derived their supplies from Lake Superior, where alone the metals have hitherto been found in the singular mechanico-chemical combination of crystals of silver in a copper matrix. Their sacrificial fires have in some cases fused the metallic offerings on the altars into a mass of molten metal, so that the Mound-Builders had thus presented to them this all-important lesson of metallurgy. Mr. F. S. Perkins, of Burlington, Wisconsin, whose collection of native copper implements numbers upwards of sixty specimens, has arrived at the conclusion that some of those from the ancient mounds have been cast in moulds; and Mr. J. W. Foster concurs in the belief that the Mound-Builders had learned to smelt the ores.[101] This still requires further proof. At Cincinnati, I saw in the collection of Mr. Cleneay, a choice specimen of a copper axe, found on the banks of Hog Creek, a tributary of the Great Miami. It measures fifteen inches long, and weighs 5 lb. 5½ oz.; but though well-proportioned, and finished with unusual care, it is entirely the work of the hammer. Only in one case, of an axe from the Lockport Mound, have I seen indications which seem to suggest a process of casting. But specimens of accidentally melted copper repeatedly occur; and Mr. Jas. B. Skinner, of Cincinnati, showed me a melted mass of pure silver, of 4 lb. weight, found lying on a heap of charcoal, in cutting through the embankment

surrounding a large mound at Marietta. Nothing further was needed than the practical sagacity by which similar accidents have been turned to account, to lead the Mound-Builders one step beyond this, to the use of the crucible and the mould. It would not, therefore, surprise me to find partial traces of the use of both. Their imitative skill, and ability in modelling, had already taught them the use of the mould when working in clay. But they had, at best, a very rudimentary knowledge of metallurgy; they do not appear to have acquired, by barter or otherwise, any specimens of the alloyed metals; and only mechanically combined their copper with silver. Hematite, though prized by them, was used simply as a stone. They were familiar with silver, and shaped it into many personal ornaments. The sulphuret of lead was also known to them; and was turned to account both for use and ornamentation.

Thus far, then, it appears that the Mound-Builders shared in the metallurgic wealth of the great copper region. We are reminded, accordingly, that the broad undulating prairie-lands of Wisconsin, with their remarkable symbolic earthworks, lie directly between the shores of Lake Superior and the region occupied by the Mound-Builders. The monuments of the latter abound with examples of their builders' arts; and are surrounded with varied proofs of settled occupation, civic and religious structures, and permanent defensive military works. Throughout Wisconsin, on the contrary, the symbolic mounds stand alone, and have hitherto been found, with a few rare exceptions, to contain no relics. Neither earthworks adapted to religious rites, nor military defences, attest that that region was occupied by a numerous population, such as its many natural advantages fitted it to sustain. Hence the conjecture

that the mineral country on the southern shores of the Great Lake was the recognised source of supply for the whole population north of the Gulf of Mexico; and that different tribes throughout the vast basin of the Mississippi and its tributaries were wont to send working parties thither, as to a region common to all. Such an idea accords with the further conjecture that the symbolic mounds of Wisconsin may be memorials of sacred rites, or pledges of neutrality among nations from the various tributaries of the great river, as they annually met on this border-land of the common metallic storehouse. It is obvious that the Mound-Builders were a highly religious people. Their superstitious rites were of frequent occurrence, and accompanied with costly sacrifices; while in the numerous symbolic mounds of Wisconsin, labour alone is the sacrifice, and the external form preserves the one idea at which their builders aimed.

So far, this theory of a sacred neutral ground and common mineral region is conjectural. Nevertheless, it involves certain facts to be borne in view for comparison with others of a diverse kind. In the once densely peopled regions of Ohio and Illinois, where the works of the Mound-Builders abound, the river-valleys were occupied by an ingenious and industrious agricultural population: who, if not aggressive and war-like, employed their constructive skill on extensive works for military defence. Whencesoever the danger existed that they had thus to apprehend and guard against, there is no trace of its localisation within the region lying immediately to the south of Lake Superior, through which their path lay to the great copper country. More probably offensive and defensive warfare was carried on between tribes or states of the Mound Race settled on different tributaries of the same great water-system.

But the growing civilisation of the nations of the Mississippi valley was also exposed to the aggression of barbarian tribes of the North-west; for if the Mound-Builders differed in culture and race from the progenitors of the modern Red Indian, some of their arts and customs render it probable that the latter were not unknown to them.

So far, then, we connect the race of the Mounds with the shores of Lake Superior, and thus trace out for them a relation to regions of the North. But the objects wrought by their artistic skill reveal no less certainly their familiarity with animals of southern and even tropical latitudes; and the materials employed in their manufactures include mica of the Alleghanies, the obsidian of Mexico, and jade and porphyry derived probably from the same region, or from others still farther south. Such facts warn us against any hastily constructed hypothesis of migrations for a people to whom the resources of so many dissimilar regions were partially known. We see in them, however, proofs of an extensive traffic; and may assume, as at least exceedingly probable, the existence of widely extended relations among that singular race. It is not to be inferred from the use of terms specifically applied to modern trade, that they are intended to suggest the possession of a currency and exchanges, of banking agencies, or manufacturing corporations. But, without confounding the traces of a rudimentary civilisation with characteristics of its mature development, there are proofs sufficient to justify the inference that the Mound-Builders traded with the copper of Lake Superior for objects of necessity and luxury brought from widely-separated regions of the continent. Such exchanges may have been effected by many intermediate agencies, rather than by any direct

traffic. But the river system of the Mississippi has furnished to the later forest tribes facilities for interchange under far less favourable circumstances; and such a systematic trade among an ingenious and settled people may have materially contributed to the progress of civilisation in the populous valleys of the Ohio.

Turning next to the carvings in stone recovered from the mounds, they include objects of singular interest, some of which, at least, fully merit the designation of works of art. Compared, indeed, with the sculptures in porphyry and the great Calendar Stone of Mexico; the elaborate façades and columned terraces of Uxmal, Zayi, and Kabah; and the colossal statues, basso-relievos and hieroglyphics of Copan and Palenque: the art of the Mound-Builders, which expended its highest efforts on the decoration of a tube, or the sculpture of a pipe-bowl, may appear insignificant enough. But the imagination is apt to be impressed by mere size, and requires to be reminded of the superior excellence of a Greek medal or a Roman gem to all the colossal grandeur of an Egyptian Memnon. The architecture and sculpture of Central America preserve to us the highest intellectual efforts of the New World, and are animated by a historical significance which cannot be overestimated. Nevertheless, examples among the miniature works of art of the Ohio Valley admit of comparison with them in some essential elements of artistic skill. Apart, indeed, from the significance of the hieroglyphics with which the colossal statues of Copan are graven, they might rank with the monstrous creations of Hindu art; whereas some of the objects taken from altars of “Mound City” furnish specimens of imitative design and portrait-sculpture full of character and individuality.

The simplicity, variety, and minute expression in many of the miniature mound-sculptures, their delicacy of execution and imitative skill, render them just objects of interest. But foremost in every trait of value for the elucidation of the history or characteristics of their workers, are the human heads, which, when the accuracy of many of the miniature sculptures of animals is considered, it can scarcely be doubted, perpetuate faithful representations of the ancient people by whom they were executed. Equally well-authenticated portraiture of Umbrian, Pelasgian, or other mythical races of Europe would be invaluable to the ethnologist. It would solve some of the knottiest problems of his science, better than all the obscure disquisitions to which the aboriginal population of Greece and Italy has given rise. American ethnologists, accordingly, have not failed to turn such iconographic evidence to even more account than legitimate induction will sustain, in support of their favourite argument for an indigenous unity of the whole ancient and modern races of the New World.

By means of such artistic relics we can determine the physical characteristics of the Mound-Builders, and of contemporary tribes or nations known to them. We also learn the character of fauna, native and foreign to the region occupied by them, with which they were familiar. I have had an opportunity of carefully inspecting the valuable collection of mound-sculptures in the possession of Dr. E. H. Davis of New York.[102] In some cases, perhaps, their artistic merits have been overrated. Nevertheless the minute accuracy with which many of the objects of natural history have been copied is remarkable; and confirms the reliance to be placed on the ethnical

portraiture perpetuated in their representations of the human head.



FIG. 77.—Portrait Mound Pipe.

Of these invaluable examples of ancient American iconography, one (Fig. 77) has attracted special notice, not only as the most beautiful head of the series, but from its supposed correspondence to the type of the modern North American Indian. The workmanship of this head is described by its discoverers as "unsurpassed by any specimen of ancient American art which has fallen under the notice of the authors, not excepting the best productions of Mexico and Peru."[103] In the well-executed illustration which accompanies these remarks, the Red Indian features are unmistakably represented; nor has this failed to receive abundant attention, and to have ascribed to it even more than its due importance. Mr. Francis Pulszky, the learned Hungarian, thus comments on it in his *Iconographic Researches on Human Races and their Art*:—"A most characteristic, we may say artistically beautiful head, the workmanship of these unknown Mound-Builders, dug up and published by Squier, exhibits the peculiar Indian features so faithfully, and with such sculptural perfection, that we cannot withhold our admiration from their artistic proficiency. It proves three things: 1st, That these Mound-Builders were American Indian in type; 2d, That time (age ante-Columbian, but otherwise unknown,) has not changed the type of

this indigenous group of races; and 3d, That the Mound-Builders were probably acquainted with no other men but themselves."[104] Such are the sweeping deductions drawn from premises supplied by a single example of mound-sculpture: or rather by the depiction of it in Messrs. Squier and Davis's volume; for after a careful examination of the original, its ethnic characteristics appear to me to be mainly due to the pencil of the draughtsman, who has, no doubt undesignedly, given to his drawing much more of the typical Indian features than are traceable in the original. Of this Figs. 77 and 78 are more accurate copies; and from these it will be seen that the nose, instead of having the salient Roman arch there represented, is perfectly straight, and is neither very prominent nor dilated.

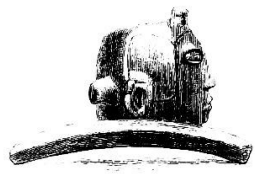


FIG. 78.—Portrait Mound Pipe.

The mouth, though protuberant, is small; the lips are thin; instead of the characteristic ponderous maxillary region of the true Indian, the chin and the upper lip are both short; and the lower jaw, without any marked width between the condyles, is small, and tapers gradually towards the chin. Perhaps it is owing to this smallness of the lower portion of the head and face, that it was supposed to represent a female. But such an idea is not suggested by any marked characteristic either in the features or head-dress. The cheek-bones, though high, are by no means so prominent as in the original engraving. Indeed, the projection is almost entirely in front,

giving a tumid cheek immediately under the eye. I doubt if any competent observer, ignorant of the history of this relic, would assign it to an Indian type.

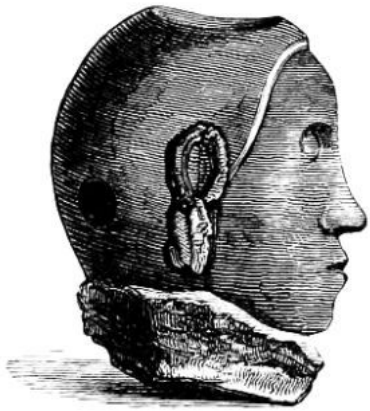


FIG. 79.—Portrait Mound Pipe.

It is apparent, therefore, that the inferences drawn from the representation of a single example of mound-sculpture are based on inaccurate premises. But even supposing the head to reproduce the features of the modern Indian: it would by no means prove the three propositions deduced from its discovery; since it is not the only specimen of sculptured portraiture discovered in the mounds, and we look in vain in other examples for these points of Indian physiognomy which would first attract the eye of the imitative modeller or sculptor. The salient and dilated nose, prominent cheek-bones, massive jaw, and large mouth, may be assigned as the most noticeable characteristics; but all or nearly all of those are wanting in most of the other sculptured heads or masks. The character of these may be seen in the head engraved here (Fig. 79), derived from the

same rich depository opened in “Mound City.” It is cut in a compact yellowish stone. The nose is nearly in a line with the forehead, excepting at the point, which projects in a manner certainly by no means characteristic of Indian features; and though the lips protrude, they are delicate, and the mouth is small. The ears in both are large, and in the latter are perforated with four small holes around their upper edges. In this case, from the delicacy of the features, it is suggested with greater probability than in the former example, that it has been designed after a female model. Another head,[105] executed in the same material, is much altered by fire. It has not, like the previous examples, been designed for a pipe-head, but is broken off from a complete human figure, or other larger piece of carving. It is much inferior as a work of art, and indeed approaches the grotesque or caricature. Nevertheless, it has considerable character in its expression; and no one familiar with the Indian cast of countenance would readily assign either to it or the previous specimen of mound-sculpture any aim at such representation, if unaware of the circumstances of their discovery. In this, as in others of the heads, the face is tattooed, and the ears have been perforated; and from the strongly attached oxide of copper, there can be little doubt that they were decorated with rings or pendants of that metal. Other portrait sculptures and terra-cottas, either found in the mounds, or discovered within the region where they chiefly abound, are figured in the works of Squier, Schoolcraft, Lapham, Foster, Jones, and in the American Ethnological Society’s Transactions. The majority of them are inferior as works of art to those already described. But if they possess any value as indications of the physiognomical type of ancient

American races, they tend to confirm the idea of a prevailing diversity instead of a uniformity of cranial form and features.

The discovery of a sculptured head betraying traces of Indian features, among many of a different type, corresponds to another interesting fact, that animals foreign to the region, and even to the North American continent, are figured in the mound-sculptures. It presents a parallel to well-known examples of Etruscan vases moulded in the form of negroes' heads; and of Greek pottery painted with the same characteristic features and woolly hair. Specimens of both are preserved among the collections of the British Museum, and furnish interesting evidence, alike of the permanency of the negro type, and of the familiarity both of Greek and Etruscan artists with the African features, long prior to the Christian era. Similar examples of foreign portraiture have attracted attention on the older monuments of Egypt, and among the basso-relievos of the tomb of Darius Hystaspes at Persepolis: supplying interesting illustrations of imitative art employed in the perpetuation of ethnic peculiarities of physiognomy. Supposing, therefore, the Mound-Builders to have been a settled population, as distinct from a contemporaneous Indian race as the classic nations of antiquity differed from the barbarian tribes beyond the Alps and the Rhine: it is no more surprising to trace the genuine Indian features in mound-sculptures, than to discover those of the Dacian or the Gaul on the column of Trajan. It proves that the Mound-Builders were familiar with the American Indian type, but nothing more. The evidence indeed tends very distinctly to suggest that they were not of the same type; since the majority of sculptured human heads hitherto recovered from

their ancient depositories do not reproduce the Indian features.

The physical type of the Mound-Builders will again come under consideration in a subsequent chapter; but it is interesting meanwhile to observe that even in the characteristics of this portrait-sculpture distinctive qualities appear. The imitative faculty manifests itself in expressive varieties of style, in modern Indian art. Some tribes, such as the Algonquins, confine themselves to literal reproductions of natural objects, while others, such as the Babeens, indulge in a grotesque and ingeniously diversified play of fancy. But the intellectual development implied in individual portraiture goes beyond this, and is rare indeed among nations in the earlier stages of civilisation. Even among the civilised Mexicans, imitations of the human face and figure appear to have seldom passed beyond the grotesque; and although the sculptors of Central America and Yucatan manifested an artistic power which accords with the civilisation of a lettered people: yet in the majority of their statues and reliefs, we see the subordination of the human form and features to the symbolism of their mythology, or to mere decorative requirements. It thus seems that, amid the general prevalence of an aptitude for imitative art, alike among the ancient and modern nations of the American continent, the Mound-Builders, though working within a narrow range, developed a power of appreciating its minuter delicacies such as is only traceable elsewhere among the choicest sculptures of Uxmal and Palenque.

To this imitative skill we owe other works which have an important significance in relation to ethnological problems affecting the ancient population of the New World. Reference has already

been made to the curious collection of stone pipes, recovered from one of the smaller tumuli of “Mound City.” They included some of the sculptured human heads; but the bowls of most of them were carved into figures of beasts, birds, and reptiles. On these the ancient sculptors appear to have lavished their artistic skill with a degree of care bestowed on none other of the less perishable works, from which alone we can now judge of their intellectual development. “Not only,” as Messrs. Squier and Davis observe, “are the features of the various objects represented faithfully, but their peculiarities and habits are in some degree exhibited. The otter is shown in a characteristic attitude, holding a fish in his mouth; the heron also holds a fish; and the hawk grasps a small bird in its talons, which it tears with its beak. The panther, the bear, the wolf, the beaver, the otter, the squirrel, the racoon, the hawk, the heron, crow, swallow, buzzard, the paroquet, toucan, and other indigenous and southern birds; the turtle, the frog, toad, rattlesnake, etc., are recognised at first glance”; [106] and in addition to those, the jaguar or panther, the cougar, the elk, the opossum, the alligator, and numerous land and water birds, including several varieties of the owls, herons, and other species, have all been recognised among more recent disclosures. Many of those are represented in characteristic attitudes, and with much skill and fidelity of portraiture. The exuberant fancy of the ancient sculptors also displays itself at times in humorous masks, and incongruous devices, such as a goose’s head cut in a hard black stone, which on looking to the back becomes a human skull. Some of those works appear to have been executed, like the sportive sketches of the modern artist, with no other object than the carver’s own gratification.

Unfinished carvings show the process by which they were wrought. A toad, in a characteristic attitude, but only roughly shaped out, “very well exhibits the mode of workmanship. While the general surface appears covered with striæ running in every direction, as if produced by rubbing, the folds and lines are clearly cut with some sort of graver. The marks of the implement, chipping out portions a fourth of an inch in length, are too distinct to admit the slightest doubt that a cutting tool was used in the work.” Again, in another pipe-head, blocked out into the form of a bird, “the lines indicating the feathers, grooves of the beak, and other more delicate features, are cut or graved on the surface at a single stroke. Some pointed tool appears to have been used, and the marks are visible where it has occasionally slipped beyond the control of the engraver. Indeed, the whole appearance of the specimen indicates that the work was done rapidly by an experienced hand, and that the various parts were brought forward simultaneously. The freedom of the strokes could only result from long practice; and we may infer that the manufacture of pipes had a distinct place in the industrial organisation of the Mound-Builders.” But this, though full of interest, need not surprise us, since the art of the arrow-maker, which required both skill and experience, was pursued among the forest-tribes as a special craft; nor is that of the pipe-maker even now wholly abandoned.

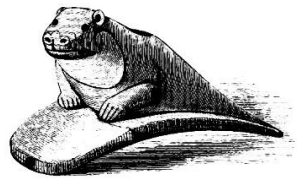


FIG. 80.—Manatee, Pipe-Sculpture.

So far, therefore, we are enabled by such means to look back into that remote past. We see the industrious sculptor at his task; and holding silent converse with him over his favourite works, we learn somewhat of his own physical aspect, of the range of his geographical experience, his mental capacity and intellectual development. The pottery of the mounds, in like manner, adds to our knowledge of the art and civilisation of the age in which it was produced. But, next in importance to the evidence thus furnished, the miniature sculptures of the mounds derive their chief value from indications they supply of the extent and nature of the geographical relations of their owners. By the fidelity of the representations of so great a variety of subjects copied from animal life, they furnish evidence of a knowledge in the Mississippi Valley of fauna peculiar not only to southern but to tropical latitudes, extending beyond the Isthmus into the southern continent: and suggestive either of arts derived from a foreign source, and intercourse maintained with regions where the civilisation of ancient America attained its highest development; or else indicating migration into the northern continent of the race of the ancient graves of Central and Southern America, bringing with them the arts of the tropics, and models derived from animals familiar to their fathers in the parent-land of the race.

Of one of the most interesting of those exotic models, the *Lamantin* or *Manatee*, seven sculptured figures have been taken from the mounds of Ohio. This phytophagous cetacean, which, when full-grown, measures from fifteen to twenty feet in length, is found only in tropical waters. Species haunt the estuaries and large rivers of Central and

intertropical South America; as also those of both the eastern and western sides of tropical Africa: and sometimes ascend the rivers to a great distance from the sea. Examples were seen by Humboldt in the Rio Meta, a branch of the Orinoco, one thousand miles above its mouth. They are also found among the Antilles, and on the coast of the Florida peninsula. The most characteristic details in their form which chiefly attracted attention when the Manatee was first brought under the notice of Europeans, are faithfully reproduced in the Mound sculptures. Fancy helped to exaggerate the peculiarities of this strange animal to the earliest European voyagers, and from them it received the name of the Siren. But its most remarkable feature is the fore paw, occupying the usual place of the cetacean fin, but bearing so close a resemblance to a human hand that the name Manatee is generally supposed to have been conferred on it by the first Spanish explorers on this account.[107] It is ranked according to ecclesiastical natural history as a fish; and its flesh is in special request at St. Christopher's, Guadaloupe, Martinique, and in various South American localities, during Lent. Its form is therefore familiar to the natives of South America, and was once equally well known to those of the Antilles, and probably to the ancient coastmen of the Gulf. But we must account by other means for the discovery of accurate representations of it among the sculptures of the far-inland Ohio mounds; and the same remark applies to the jaguar or panther, the cougar, the toucan; to the buzzard possibly, and also to the paroquet. The majority of those animals are not known in the United States; some of them are totally unknown within any part of the North American continent. Others may be classed with the paroquet, which, though essentially a

southern bird, and common around the Gulf, does occasionally make its appearance inland; and so might become known to the untravelled Mound-Builder in his northern home.

The importance of such evidence that the ancient dwellers in the Scioto Valley had some knowledge of tropical animals, and even of those confined exclusively to the southern continent, has not escaped the notice of the explorers of the mounds. It has even induced them to hesitate in assigning the name of the toucan to sculptures concerning the design of which there could be no other reasonable ground for doubt. Referring to the manatee sculptures, they remark: “These singular relics have a direct bearing upon some of the questions connected with the origin of the mounds. They are undistinguishable, so far as material and workmanship are concerned, from an entire class of remains found in them, and are evidently the work of the same hands with the other effigies of beasts and birds; and yet they faithfully represent animals found (and only in small numbers), a thousand miles distant upon the shores of Florida, or—if the birds seemingly belonging to the zygodactylous order be really designed to represent the toucan,—found only in the tropical regions of South America. Either the same race, possessing throughout a like style of workmanship, and deriving their materials from a common source, existed contemporaneously over the whole range of intervening territory, and maintained a constant intercommunication; or else there was at some period a migration from the south, bringing with it characteristic remains of the land from which it emanated. The sculptures of the manatees are too exact to have been the production of those who were not well acquainted with the animal and its habits.”

Of the representations of the toucan, the accompanying woodcut (Fig. 81) will furnish a sufficient illustration. It is imitated with considerable accuracy, though inferior to some of the finest specimens of mound sculpture. The most important deviation from correctness of detail is, that it has three toes instead of two before, although the two are correctly represented behind. It is stooping its head to take food from a rudely outlined human hand; and as it is known that the brilliant plumage of the toucan leads to its being frequently tamed by the natives of Guiana and Brazil, this tends not only to confirm the idea of its representation by the sculptures in question: but to suggest that the Mound-Builders may have had aviaries, like those in which the Aztec caciques assembled birds of splendid plumage and beautiful form from every part of their Mexican empire.

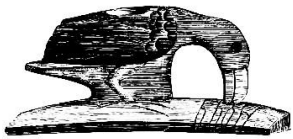


FIG. 81.—Toucan, Pipe-Sculpture.

Unless we assume such a lapse of time as may suffice for important changes in the climate and fauna of the Ohio Valley, the evidence thus far adduced suggests the inference either that the whole extensive regions thus indicated were occupied at some remote period by a common race; or we must recognise in such indications of familiarity with the natural history of the tropics, and even of the southern continent, proof that that very people, who derived all their metal from the great northern regions of Lake Superior, had themselves migrated from southern latitudes rich in metallic ores.

Various considerations tend to favour the idea of such a migration, rather than the maintenance of intercommunication and exchange, among a people of the same race, throughout regions so extensive and so geographically distinct. If the Mound-Builders had some of the arts and models, not only of Central but of Southern America: they also employed in their ingenious manufactures pearls and shells of the Gulf of Florida; obsidian from Mexico; mica believed to have been brought from the Alleghanies; jade, such as that described by Humboldt among the rare materials of ancient manufacture in Chili; the lead of Wisconsin; and the copper, and probably the silver, of Ontonagon and the Keweenaw peninsula. The fact indeed that some of their most elaborate carvings represent birds and quadrupeds belonging to latitudes so far to the south, naturally tends to suggest the idea of a central region where arts were cultivated to an extent unknown in the Mississippi Valley; and that those objects, manufactured where such models are furnished by the native fauna, remain only as evidences of ancient intercourse maintained between these latitudes and the localities where now alone such are known to abound. But in opposition to this, full value must be given to the fact that neither the relics, nor the customs which they illustrate, pertain exclusively to southern latitudes; nor are such found to predominate among the singular evidences of ancient and more matured civilisation which abound in Central and Southern America. The varied nature of the materials employed in the arts of the Mound-Builders, we must also remember, indicates a wide range of relations; though it cannot be assumed that these were maintained in every case by direct intercourse.

The earlier students of American archæology, like

the older school of British antiquaries, gave full scope to a system of theorising which built up comprehensive ethnological schemes on the very smallest premises; but in the more judicious caution of later writers there is a tendency to run to the opposite extreme. Perhaps Messrs. Squier and Davis indulge at times in an exaggerated estimate of the merits of the remarkable works of art discovered and published as the result of their joint labours; but subsequent critics have either unduly depreciated them, or solved the difficulties attendant on such discoveries, by ascribing their manufacture to an undetermined foreign source. Mr. Schoolcraft specially manifested a disposition to underrate the artistic ability discernible in some of them; while Mr. Haven, who fully admits their skilful execution, derives from that very fact the evidence of foreign manufacture. After describing the weapons, pottery, and personal ornaments obtained from the mounds, the latter writer adds, “and, with these were found sculptured figures of animals and the human head, in the form of pipes, wrought with great delicacy and spirit from some of the hardest stones. The last-named are relics that imply a very considerable degree of art; and if believed to be the work of the people with whose remains they are found, would tend greatly to increase the wonder that the art of sculpture among them was not manifested in other objects and places. The fact that nearly all the finer specimens of workmanship represent birds, or land and marine animals belonging to a different latitude; while the pearls, the knives of obsidian, the marine shells, and the copper equally testify to a distant, though not extra-continental origin, may, however, exclude these from being received as proofs of local industry and skill.”[108]



FIG. 82.—Peruvian Black Ware.

A reconsideration of the list already given of animals sculptured by the ancient pipe-makers, cannot fail to satisfy the inquirer that it is an over-statement of the case to say that nearly all belong to a different latitude. The real interest and difficulty of the question lie in the fact of discovering, along with so many sculptured figures of animals pertaining to the locality, others represented with equal spirit and fidelity, though belonging to diverse latitudes. To those familiar with early Scandinavian and British antiquities, such an assignment of the mound sculptures to a foreign origin, on account of their models being in part derived from distant sources, must appear a needless assumption which only shifts without lessening the difficulty. On the sculptured standing stones of Scotland—belonging apparently to the closing era of Paganism, and the first introduction of Christianity there,—may be seen the tiger or leopard, the ape, the camel, the serpent, and as supposed by some, the elephant and walrus, along with other representations or symbols, borrowed, not like the models of the Mound-Builders, from a locality so near as to admit of the theory of direct commercial intercourse, or recent migration, but from remote districts of Asia, or from Africa. The most noticeable difference between the imitations of foreign fauna on the Scottish monuments, and in the ancient American sculptures, is that the former

occasionally betray, as might be expected, the conventional characteristics of a traditional type; while the latter, if they furnish evidence of migration, would in so far tend to prove it more recent, and to a locality not so distant as to preclude all renewal of intercourse with the ancestral birth-land. Traces of the same reproduction of unfamiliar objects are, indeed, apparent in the mound sculptures. The objects least truthfully represented, in some cases, are animals foreign to the region where alone such works of art have been found. But the South American toucan of the mound sculptor, figured on a previous page, is certainly not inferior to the accompanying specimens of the Peruvian modeller's imitative skill, wrought on a vessel of black ware (Fig. 82), now in the collection of the Society of Antiquaries of Scotland: though it will be remembered that the latter are the work of an artist to whom the original may be presumed to have been familiar. Several of the animals engraved in the *Ancient Monuments of the Mississippi Valley* fall far short of the fidelity of imitation ascribed to them in the accompanying text: but the characteristic individuality of others displays remarkable imitative power. The lugubrious expression given to more than one of the toads is full of humour; and some of the ruder human heads may be described as portrait-sketches in the style of *Punch*. But after making every requisite deduction from the exaggerations of enthusiastic observers, abundant evidence of artistic skill and ingenuity remains to justify the wonder that a people capable of executing such works should have left no large monuments of their art. While, however, this affords no sufficient ground for transferring their origin to another region, we may still look with interest for the discovery of analogous

productions in some of the great centres of native American civilisation.

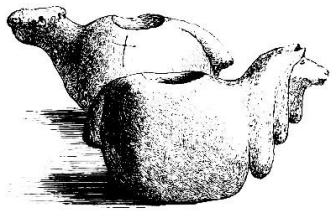


FIG. 83.—Peruvian Stone Mortars.

With one or two stray exceptions, objects precisely similar to the mound sculptures have not hitherto been met with, beyond the valleys where other traces of the Mound-Builders abound; but the points of resemblance between the sculptured mound-pipes and numerous miniature stone mortars found in Peru are too striking to be overlooked. Of the two examples given here (Fig. 83), the one is a llama, from Huarmachaco, in Peru, in the collection of the Historical Society of New York. It is cut in a close-grained black stone, and measures four inches long. The other, of darkish brown schist, is from a drawing made by Mr. Thomas Ewbank, while in Peru. The greater number of those seen by him represent the llama and its congeners, the alpaca, guanoco, and vicuna. They are all hollowed precisely like the bowl of the sculptured mound-pipes, but have no lateral perforation or mouth-piece. Their probable use was as mortars, in which the Peruvians rubbed tobacco into powder, working it with a small pestle until it became heated with the friction, when it was taken as snuff. The transition from this practice to that of inhaling the burning fumes is simple; and the correspondence between the ancient Peruvian tobacco-mortar and the stone pipe of the

Mound-Builder is worthy of note, when taken into consideration along with the imitations of birds of the southern continent found among the sculptures of the mounds. Dr. Tschudi describes four of the Peruvian mortars preserved at Vienna, carved in porphyry, basalt, and granite; and he adds: “How the ancient Peruvians, without the aid of iron tools, were able to carve stone so beautifully, is inconceivable.”

The absence of any but such miniature carvings in the northern mounds may also merit notice when viewed in connection with the ideas of religious worship suggested by the contents of the mound altars. Idolatry, in its most striking, and also in some of its most barbarous forms, prevailed, as we know, among the nations of the Mexican Valley, at the period of the Conquest. The monuments of Yucatan and Central America leave no room to doubt that the worship of such visible impersonations of Divine attributes as their sculptors could devise formed a prominent part of their religious services. Reference has also been made in a previous chapter to rudely modelled and sculptured idols, accompanying other ancient remains, in sepulchral deposits in Tennessee. Others have been found in the huacals of Chiriqui, on the Isthmus of Panama, along with numerous gold relics and many fine specimens of pottery. Those facts render it the more singular that, amid so many traces of imitative sculpture, no relics obviously designed as objects of worship have been dug up in the mounds, or found in such circumstances as to connect them with the religious practices of the Mound-Builders. But the remarkable characteristics of the elaborately sculptured pipes, and their obvious connection with services accompanying some of the rites of sacrifice or cremation, may indicate their having played an important part in the religious

solemnities of the ancient race; and on this the arts and customs of modern tribes help to throw some curious light.

So far as we can now infer from evidence furnished by relics connected with the use of the tobacco-plant, it seems to have been as familiar to the ancient tribes of the North-west, and the aborigines of the Canadian forests, as to those of the American tropics, of which the *Nicotiana tabacum* is a native. No such remarkable depositories indeed have been found to the north of the great lakes as those disclosed to the explorers of the tumuli in the Scioto Valley; but even now the tobacco-pipe monopolises the ingenious art of many tribes; and some of their most curious legends and superstitions are connected with the favourite national implement. Among them the dignity of time-honoured use has conferred on it a sacredness, which survives with much of its ancient force; and to this accordingly the student of American antiquities is justified in turning, as a link connecting the present with that ancient past. But it is worthy of note that the form of the mound-pipes differs essentially from the endless varieties of pattern wrought by Indian ingenuity. Some consideration, therefore, of the arts of the modern pipe-sculptor, and of native customs and traditions associated with the use of tobacco, is necessary, as a means of comparison between ancient and modern races of the New World.

In the Old World, the ideas connected with the tobacco-pipe are prosaic enough. The chibouk may, at times, be associated with the poetical reveries of the oriental daydreamer, and the hookah with pleasant fancies of the Anglo-Indian reposing in the shade of his bungalow; but its seductive antique mystery, and all its symbolic significance, pertain to

the New World. Longfellow, accordingly, fitly opens his *Song of Hiawatha* with the institution of "the peace-pipe." The Master of Life descends on the mountains of the prairie, breaks a fragment from the red stone of the quarry, and, fashioning it with curious art into a pipe-head, he fills it with the bark of the red willow, chafes the forest into flame with the tempest of his breath, and kindling it, smokes the calumet as a signal to the nations. The tribes gather at the divine summons from river, lake, and prairie, to listen to the warnings and promises with which the Great Spirit seeks to guide them; and this done, and the warriors having buried their war-clubs, they smoke their first peace-pipe, and depart:—

"While the Master of Life, ascending,
Through the opening of cloud-curtains,
Through the doorways of the heaven,
Vanished from before their faces
In the smoke that rolled around him,
The pukwana of the peace-pipe!"

In this, as in other passages of his national epic, the American poet has embodied cherished legends of the New World: placing the opening scene of *Hiawatha* on the heights of the red pipe-stone quarry of Coteau des Prairies, between the Minnesota and Missouri rivers.

On the summit of the ridge between these two tributaries of the Mississippi rises a bold cliff, beautifully marked with horizontal layers of light grey and rose or flesh-coloured quartz. From the base of this a level prairie of about half a mile in width runs parallel to it; and here it is that the famous red pipe-stone is procured, at a depth of from four to five feet from the surface, in a ravine at the head of the Pipe-stone Creek, a tributary of the Big Sioux River. Numerous excavations indicate the resort of Indian

tribes to the locality. “That this place should have been visited,” says Catlin, “for centuries past by all the neighbouring tribes, who have hidden the war-club as they approached it, and stayed the cruelties of the scalping-knife, under the fear of the vengeance of the Great Spirit who overlooks it, will not seem strange or unnatural when their superstitions are known. That such has been the custom there is not a shadow of doubt, and that even so recently as to have been witnessed by hundreds and thousands of Indians of different tribes now living, and from many of whom I have personally drawn the information.”[109]

The enterprising traveller speaks elsewhere of thousands of inscriptions and drawings observed by him on the neighbouring rocks; while the feeling in which they originate was thus illustrated by an Indian whose portrait he painted when in the Mandan country:—“My brother,” said the Mandan, “you have made my picture, and I like it much. My friends tell me they can see the eyes move, and it must be very good; it must be partly alive. I am glad it is done, though many of my people are afraid. I am a young man, but my heart is strong. I have jumped on to the Medicine Rock; I have placed my arrow on it, and no Mandan can take it away. The red stone is slippery, but my foot was true; it did not slip. My brother, this pipe which I give to you I brought from a high mountain; it is towards the rising sun. Many were the pipes we brought from thence, and we brought them away in peace. We left our totems on the rocks; we cut them deep in the stones; they are there now. The Great Spirit told all nations to meet there in peace, and all nations hid the war-club and the tomahawk. The Dahcotahs, who are our enemies, are very strong; they have taken up the tomahawk,

and the blood of our warriors has run on the rocks. We want to visit our medicines. Our pipes are old and worn out."

The Medicine or Leaping Rock, here referred to, is a detached column standing between seven and eight feet from the precipitous cliff; and the leap across this chasm is a daring feat which the young warriors are ambitious of performing. It was pointed out to Catlin by a Sioux chief, whose son had perished in the attempt. A conical mound marked the spot of his sepulture; and though the sanctity of this ancient neutral ground has been invaded, and the Sioux now refuse to permit other tribes to have access to it, this is of quite recent occurrence. The memorials of many tribes on the graven rocks; numerous excavations, sepulchral mounds, and other earthworks in the vicinity; and the recovery from time to time, in chance excavations, or in ancient ossuaries and grave-mounds, of pipes wrought in the favourite material: all confirm the Indian tradition that this had been recognised as neutral ground by the tribes to the west, and many of those to the east of the Mississippi, to which they have made regular pilgrimages to renew their pipes from the rock consecrated by the footprints of the Great Spirit. The marks of his footsteps are pointed out, deeply impressed in the rock, and resembling the track of a large bird!

Mandan traditions respecting this sacred spot have a special interest; for the migrations of that once powerful Indian nation have been traced from the country lying between Lake Erie and Cincinnati, down the Valley of the Ohio, over the graves of the ancient Mound-Builders, and thence up the western branch of the Mississippi, until the extinction of nearly the whole nation, by the ravages of the small-

pox, in the year 1838, at their latest settlements on the Upper Missouri. The site of their last homes lies to the north of the Sioux's country, in whose possession the pipe-stone quarries are now vested by the law of the strongest. To the Sioux, accordingly, the guardianship of the traditions of the locality belongs. For, although they have thus set at defiance its most sacred characteristic, and so slighted the mandate of the Great Spirit, they do not the less strongly hold by the superstitious ideas associated with the spot.

One of these legends is connected with the peculiar features of the scene. Five large granite boulders form prominent objects on the level prairie in the vicinity of the pipe-stone quarries; and two holes under the largest of them are regarded by the Sioux as the abodes of the guardian spirits of the spot. Catlin, who broke off and carried away with him fragments of these sacred boulders, remarks: "As for the poor Indian, his superstitious veneration of them is such, that not a spear of grass is broken or bent by his feet within three or four roods of them, where he stops, and, in humble supplication, by throwing plugs of tobacco to them, solicits permission to dig and carry away the red stone for his pipes." For here, according to Indian tradition, not only the mysterious birth of the peace-pipe, but the postdiluvian creation of man, took place.

The institution of the peace-pipe is thus narrated by the Sioux: "Many ages after the red men were made, when all the tribes were at war, the Great Spirit called them together at the Red Rocks. He stood on the top of the rocks, and the red nations were assembled on the plain below. He took out of the rock a piece of the red stone, and made a large pipe. He smoked it over them all; told them that it

was part of their flesh; that though they were at war, they must meet at this place as friends; that it belonged to them all; that they must make their calumets from it, and smoke them to him whenever they wished to appease him or get his goodwill. The smoke from his big pipe rolled over them all, and he disappeared in its cloud. At the last whiff of his pipe a blaze of fire rolled over the rocks and melted their surface. At that moment two Indian maidens passed in a flame under the two medicine rocks, where they remain to this day. The voices of Tsomecostee and Tsomecostewondee, as they are named, are heard at times in answer to the invocations of the suppliants, and they must be propitiated before the pipe-stone is taken away."

An offering of tobacco is the usual gift, and it appears to have been employed in similar acts of worship from the earliest period of intercourse with Europeans. In the narrative of the voyage of Drake, in 1572, it is stated that the natives brought a little basket made of rushes, and filled with an herb which they called *tobak*. This was regarded as a propitiatory offering; and the writer subsequently notes: they "came now the second time to us, bringing with them, as before had been done, feathers and bags of *tobak* for presents, or rather, indeed, for sacrifices, upon this persuasion that we were gods." Harriot in like manner tells, in his "Briefe and True Report of the New Found Land of Virginia," of a plant which the Spaniards generally call *tobacco*, but there named by the natives *uppówoc*. "This *uppówoc* is of so precious estimation among them, that they think their gods are marvellously delighted therewith, whereupon sometime they make halowed fires, and cast some of the powder therein for a sacrifice. Being in a storme upon the waters, to pacifie their gods

they cast some up into the aire, and into the water; so a weare for fish being newly set up, they cast some therein and into the aire; also after an escape of danger, they cast some into the aire likewise; but all done with strange gestures, stamping, sometime dancing, clapping of hands, holding up of hands, and staring up into the heavens, uttering therewithal and chattering strange words and noises."

Such practices and ideas of propitiatory offerings among southern Indian tribes of the sixteenth century, show that the offerings of tobacco still made by the Sioux to the spirits that haunt the pipe-stone quarry, are of no merely local origin, but were anciently as universal as the peace-pipe itself. Nor were such religious associations confined to the favourite narcotic of the northern continent. Among the Peruvians the coca-plant took the place of tobacco; and Dr. Tschudi states that he found it regarded by the Indians as something sacred and mysterious. "In all ceremonies, whether religious or warlike, it was introduced for producing smoke at the great offerings, or as the sacrifice itself. During divine worship the priests chewed coca-leaves; and, unless they were supplied with them, it was believed that the favour of the gods could not be propitiated." Christianity, after an interval of upwards of three hundred years, has not eradicated the Indian's faith in the virtues of the sacred plant. In the mines of Cerro de Pasco, masticated coca is thrown on the hard veins of metal to propitiate the gnomes of the mine, who, it is believed, would otherwise render the mountains impenetrable; and leaves of it are secretly placed in the mouth of the dead, to smooth the passage to another world. Thus we find, in the superstitions perpetuated among the Indians of the southern Cordilleras, striking analogies to those

which survive among the Sioux, and give character to the strange rites practised by them at the red pipe-stone quarry, on the Coteau des Prairies.

One of the Indian traditions connected with that locality, which seems to perpetuate the idea of a general deluge, was thus narrated by a distinguished Knisteneaux on the Upper Missouri, on the occasion of presenting to Catlin a handsome red-stone pipe: “In the time of a great freshet, which took place many centuries ago, and destroyed all the nations of the earth, all the tribes of the red men assembled on the Coteau des Prairies, to get out of the way of the waters. After they had gathered here from every part, the water continued to rise, until at length it covered them all in a mass, and their flesh was converted into red pipe-stone. Therefore, it has always been considered neutral ground; it belongs to all tribes alike, and all were allowed to get it and smoke it together. While they were all drowning in a mass, a young woman, Kwaptahw, a virgin, caught hold of the foot of a very large bird that was flying over, and was carried to the top of a high cliff not far off, that was above the water. Here she had twins, and their father was the war-eagle, and her children have since peopled the earth.” The idea that the red pipe-stone is the flesh of their ancestors is a favourite one among different tribes. When Catlin and his party attempted to penetrate to the sacred locality, they were stopped by the Sioux, and one of them addressing him, said: “This red-pipe was given to the red men by the Great Spirit. It is a part of our flesh, and therefore is great medicine. We know that the whites are like a great cloud that rises in the east, and will cover the whole country. We know that they will have all our lands; but if ever they get our red-pipe quarry they will have to pay very dear for it.”

Thus is it that even in the farthest West the Indian feels the fatal touch of that white hand; and to the intrigues of interested traders is ascribed the encroachment of the Sioux on the sacred neutral ground, where, within memory of living men, every tribe on the Missouri had smoked with their enemies, while the Great Spirit kept the peace among his red children.

Apart, then, from such indications of an artistic power of imitation, by which the ancient pipe-sculptors are distinguished, it becomes an object of interest to observe other elements, either of comparison or contrast, between the memorials of the Mound-Builders' skill, and numerous specimens of pipe-sculpture produced by modern tribes.

Notwithstanding the endless variety which characterises the ancient Mound-Builders' pipes, one general type is traceable through the whole. A curved base forms the stem and handle, from the centre of which rises the bowl, as shown in Fig. 78, so that it is complete as found; whereas the modern Indian generally employs a pipe-stem, and ascribes to it the peculiar virtues of the implement. The medicine-man decorates it with his most elaborate skill, and it is regarded with awe and reverence by the whole tribe. The stem would seem, therefore, to be characteristic of the modern race; if indeed it be not the distinguishing memorial of an origin of the Northern tribes diverse from Toltecan and other ancient nations. One idea which such comparisons suggest is that in the sacred associations with the pipe of the Mound-Builders, we have indications of contact between a migrating race of Central or Southern America, where no superstitious pipe-usages have been found, and one of the Northern tribes among whom such superstitions are most

intimately interwoven with all their sacred mysteries.

The utmost variety distinguishes the pipes of the modern Indians: arising in part from the local facilities they possess for a suitable material, and in part also from the special style of art and decoration which has become traditional with the tribe. The easily wrought red pipe-stone has been generally sought after, from the beauty of its colour and texture, as well as the mysterious virtues attached to it. But the pipe-sculptures of many tribes can be distinguished no less certainly by the material, than by the favourite conventional pattern.

Among the Assinaboin Indians a fine marble, much too hard to admit of minute carving, but susceptible of a high polish, is cut into pipes of graceful form, and made so extremely thin, as to be nearly transparent. When lighted the glowing tobacco shines through, and presents a singular appearance at night, or in a dark lodge. Another favourite stone is a coarse species of jasper, also too hard to admit of elaborate ornamentation. But the choice of material is by no means invariably guided by the facilities which the position of the tribe affords. Mr. Kane informed me that, in coming down the Athabaska river, when near its source in the Rocky Mountains, he observed his Assinaboin guides select the favourite bluish jasper from among the water-worn stones in the bed of the river, to carry home for the purpose of pipe manufacture, although they were then fully five hundred miles from their lodges; and my own Chippewa guides carried off pieces from the pipe-stone rock, at the mouth of the Neepigon river, though they had several hundred miles to traverse before they would reach their homes. Such traditional adherence to the choice of materials peculiar to a remote source, as well as the

perpetuation of special forms and patterns, are of value as clews to former migrations, and indications of affinity among scattered tribes.



FIG.84.—Chippewa Pipe.

The Chippewas, at the head of Lake Superior, carve their pipes out of a dark close-grained stone procured from Lake Huron; and frequently introduce groups of animals and human figures with considerable artistic skill. *Pabahmesad*, or the Flier, an old Chippewa, still living on the Great Manitoulin Island in Lake Huron, is generally known as *Pwahguneka*, the Pipe Maker, literally "he makes pipes." Though brought in contact with the Christian Indians of the Manitoulin Islands, he resolutely adheres to the pagan creed and rites of his fathers, and resists all encroachments of civilisation. He gathers his materials from the favourite resorts of different tribes, using the *muhkuhda-pwahgunahbeck*, or black pipe-stone of Lake Huron; the *wahbe-pwahgunahbeck*, or white pipe-stone, procured on St. Joseph's Island; and the *misko-pwahgunahbeck*, or red pipe-stone of the Coteau des Prairies. His saw, with which the stone is first roughly blocked out, is made of a bit of iron hoop; and his other tools are correspondingly rude. Nevertheless the workmanship of Pabahmesad shows him to be a master of his art; as will be seen from a characteristic illustration of his ingenious sculpture, engraved here (Fig. 84) from the original, in the museum of the University of Toronto.



FIG. 85.—Babeen Pipe.

But the most elaborate and curious specimens of pipe-sculpture are those executed by the Chimpseyan or Babeen Indians, who also carve skilfully in wood and bone. They display much ingenuity in grass-plaiting for hats and waterproof baskets, or kettles; and in the manufacture of basket-nets of wicker-work, with which they catch the ulikon, a kind of smelt abundant in the rivers along their coast. They are, indeed, pre-eminent among the savages of the North Pacific coast for artistic skill; yet to all appearance, in the collision with the whites, their extermination is inevitable at no distant date. The frontispiece, Plate 1. illustrates the characteristic physiognomy of this people. It is the portrait of Kaskatachyuh, a Chimpseyan chief, from sketches taken by Mr. Paul Kane, while travelling in their country. He wears one of the native hats made of dyed and plaited grass. The Chimpseyans belong to the Thlinket stock, tribes of which extend as far north as Behring Bay. They do not feast on the whale, because it is one of their tribal totems; but the blubber of the porpoise and seal is a favourite delicacy. The Babeens or big-lip Indians,—as the Chimpseyans are most frequently called,—have received this name from the deformation of the under-lip in the women of the tribe, produced by the insertion of a piece of wood into a slit made in infancy, and increased in size until the lip protrudes like the bill of a duck; and among the wooden masks which they carve of life-size, this protruding lip is the invariable characteristic of those of the women. Other and not less singular customs mark the distinction between the sexes, and are perpetuated even after death. Their women are wrapped in mats and placed on an elevated platform, or in a canoe raised on poles, while the bodies of the males are

invariably burned. The Chimpseyans and the Clalam Indians, occupying Vancouver's Island and the coasts in the neighbourhood of Charlotte's Sound, carve bowls, platters, and other utensils out of a blue claystone or slate, from which also they make their pipes, and decorate them with many ingenious and grotesque devices. One of the smaller and simpler of these pipes, shown in Fig. 85, is placed here alongside of a *chef-d'œuvre* of Pabahmesad, the Chippewa artist. Nothing could better serve to illustrate the contrast between the ingenious imitative art of Algonquin pipe-sculpture and the exuberant fancifulness of the Babeen carvings. Large and complicated designs are common, sometimes inlaid with bone or ivory, and embracing every native or foreign object adapted to the sculptor's fancy. The same talent for carving finds room for its display on their ivory combs; and on ladles and spoons made from the horns of a mountain goat, which is one of the principal animals that they hunt on land. The claystone carvings of strictly native design chiefly occur on their pipe-sculptures, and consist of human figures, and of strange monstrosities intermingling human and brute forms, in which curious analogies may frequently be traced to the sculptures of Central America. But the powers of observation and imitation are most strikingly illustrated in claystone carvings of objects of foreign origin. The collections formed by the United States Exploring Expedition, now at Washington, include numerous specimens of this class, representing European houses, forts, boats, horses, and fire-arms; and reproducing in minute detail the cords, pulleys, and other minutiæ of the shipping which frequent the coast. The example shown in Fig. 86 is a curious combination of native and foreign elements; and may

be regarded as the conventional representation by the native artist of a bear hunt in the vicinity of one of the Hudson Bay Company's stations. The animal-heads on some of the human figures represent the grotesque masks already referred to as among their favourite carvings, and a special branch of native art. They are executed in wood, the size of life, and brilliantly coloured; and are worn in the grand dances of the tribe.



FIG. 86.—Babeen Pipe-Sculpture.

In some of the larger pipes, the entire group presents much of the grotesque exuberance of fancy, mingled with imitations from nature, which constitute the charm of ecclesiastical sculptures of the thirteenth century. Figures in the oddest varieties of posture are ingeniously interlaced, and connected by elaborate ornaments; the intermediate spaces being perforated, so as to give great lightness to the whole. But though well calculated to recall the quaint products of the medieval sculptor's chisel, such comparisons are not suggested by any imitation of European models. Their style of art is thoroughly American; and traits of the same peculiar devices and modes of thought which mark some of the most finished sculptures of Yucatan are replete with interest, when thus recognised in regions so remote, and in the productions of rude Indian tribes.

But while the modern Indian thus rivals in the elaborateness of his art the ingenious pipe-sculpture of the mounds, all his superstitious reverence is reserved for the pipe-stem. On it depends the safety

of the tribe in peace, and its success in war. It is guarded accordingly with jealous care, and produced at the medicine dance or the war-council with mysterious ceremonies. Even on such great occasions, so long as the medicine pipe-stem is used, it is a matter of indifference whether the bowl attached to it be of the richest carving, or a common trader's clay-pipe. Many special privileges and honours pertain to its bearer. It is not only disrespectful, but unlucky, to pass between him and the fire. An ornamental tent is provided for his use, and his other official accoutrements are so numerous that frequently he requires to maintain several horses for their transport. A bear-skin robe is employed for wrapping up the consecrated pipe-stem, and thus enveloped, it is usually borne by the favourite wife of the dignitary. But it is never allowed to be uncovered in her presence; and should a woman, even by chance, cast her eyes on it, its virtues can only be restored by a tedious ceremony.

Among the Indian portraits executed by Mr. Paul Kane, is one of Kea-keke-sacowaw, head chief of the Crees, whom he met on the Saskatchewan, engaged in raising a war-party against the Blackfeet. He had with him eleven medicine pipe-stems, the pledges of different bands that had joined him. The grim old chief appears decorated with his war-paint, and holding in his hand one of the pipe-stems adorned with the head and plumage of an eagle. Before beginning his work, the artist had to witness the ceremony of "opening the medicine pipe-stem," in the course of which he smoked each of the eleven pipes; and, thus enlisted in the cause, his painting was esteemed a great medicine, calculated to contribute materially to the success of the war-party.

A young Cree Half-breed confessed to the painter

that, in a spirit of daring scepticism, he had once secretly thrown down the medicine pipe-stem and kicked it about; but soon after, its official carrier was slain, and such misfortunes followed as left no doubt on his mind of the sanctity pertaining to this guardian and avenger of the honour of the tribe.

But all the ideas and superstitions which such usages illustrate, are peculiar to the modern Indians. The pipes of the Mound-Builders show that they used no pipe-stem; and the same appears to have been the case with the Mexicans before the Conquest. Throughout the whole of Lord Kingsborough's great work, traces of the use of the tobacco-pipe are rare; and where they do occur they tend to confirm the idea that it was not invested, either in Mexico or Central America, with such sacred attributes as were attached to it by the ancient race of the Mississippi Valley: and which, under other but no less peculiar forms, are maintained among the Indian tribes of the North-west.

Various early writers on the customs of the American Indians refer to expiatory sacrifices, which present striking, though rude analogies, to the ancient offerings by fire on the mound-altars. Hearne describes a custom among the Chippewas, after the shedding of blood, of throwing all their ornaments, pipes, etc., into a common fire, kindled at some distance from their lodges; and Winslow narrates of the Nanohigganset of New England, that they had a great house ordinarily resorted to by a few, whom he supposes to be priests; but he adds, "Thither, at certain times, resort all their people, and offer almost all the riches they have to their gods, as kettles, skins, hatchets, beads, knives, etc., all which are cast by the priests into a great fire that they make in the midst of the house."[110] The analogies, however,

which appear to be traceable in such practices of tribes remote from the localities of the old Mound-Builders, are after all slight, and lack the most important elements which give a special character to the ancient mound-altars. The use of tobacco is no longer a characteristic peculiar to the New World; but it may be that in the mode of indulging in its favourite narcotic, we have perpetuated as a practice of mere sensual indulgence, what was once a solemn rite associated with the mysterious worship of the sacred enclosures and the altar-mounds of the Mississippi Valley. Oviedo, who is the earliest authority, at least for any minute account of tobacco-smoking among the native tribes, speaks of it as an evil custom practised among the Indians of Hispaniola to produce insensibility; and greatly prized by the Carribees, who called tobacco *kohiba*, and "imagined, when they were drunk with the fumes of it, the dreams they had were in some sort inspired."[111] Again, Girolamo Benzoni narrates in his travels in America, recently translated from the edition of 1753 by Rear-Admiral Smyth: "In La Española, and the other islands, when their doctors wanted to cure a sick man, they went to the place where they were to administer the smoke, and when he was thoroughly intoxicated by it the cure was mostly effected. On returning to his senses, he told a thousand stories of his having been at the council of the gods, and other high visions."[112]

Many Indian legends ascribe a divine origin to tobacco. A chief of the Susquehannas told of two hunters of the tribe sharing the venison they had cooked with a lovely squaw, who suddenly appeared to them; and on returning to the scene of their feast thirteen moons after, they found the tobacco plant growing where she had sat. Harriot, who sailed in Sir

Walter Raleigh's expedition of 1584, states that the Indians of Virginia regarded tobacco as a means of peculiar enjoyment, in which the Great Spirit was wont freely to indulge, and that he bestowed it on them that they might share in his delights. Repeated allusions also refer to its intoxicating effects as an influence analogous to that which produced the visions and inspirations of their fasting dreams. It seems, therefore, by no means improbable, that the original practice of inhaling the fumes of tobacco was associated exclusively with superstitious rites and divination; so that the tobacco-plant may have played a part in the worship of the ancient Mound-Builders, analogous to that of the inspiring vapour over which the Delphic tripod was placed, when the priestess of Apollo prepared to give utterance to the divine oracles.

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[100] Vide *Prehistoric Annals of Scotland*, vol. i. pp. 496-498.

[101] *Prehistoric Races of the United States*, p. 293.

[102] This collection has since been acquired for the Blackmore Museum.

[103] *Ancient Monuments of the Mississippi Valley*, p. 245, fig. 145.

[104] *Indigenous Races of the Earth*, p. 183.

[105] *Ancient Monuments of the Mississippi Valley* (No. 143).

[106] *Ancient Monuments of the Mississippi Valley*, p. 152.

[107] This derivation from the Spanish *Mano* is rejected by some etymologists for a native Carib one, *Manattoüi*.

[108] *Archæology of the United States*, p. 122.

[109] *Illustrations of the Manners, etc., of the North American Indians.* By Geo. Catlin. Eighth edition. Vol. ii. p. 167. *Vide Proceed. Amer. Philosoph. Soc.*, vol. x. p. 274.

[110] *Mass. Hist. Coll.*, Second Series, vol. ix. p. 94.

[111] *Historia General de las Indias*, second edit. p. 74.

[112] *History of the New World.* By Girolamo Benzoni. Hakluyt Society, 1857.

THE END

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[The end of *Prehistoric Man: Researches into the Origin of Civilization in the Old and the New World*, by Daniel Wilson.]

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