

*Torreya californica*, *Torreya nucifera*, *Torreya grandis* preserve his memory as green as their own perpetual verdure.\*

MARCUS BENJAMIN.

U. S. NATIONAL MUSEUM.

(*To be continued.*)

THE HISTORY OF THE BEGINNINGS OF THE  
SCIENCE OF PRE-HISTORIC ANTHRO-  
POLOGY.

II.

*Paleolithic Age in the United States.*

The existence of the paleolithic stage of culture in America has been doubted, and, indeed, strenuously denied by some of our scientists who are well up in archeology and prehistoric anthropology.

My somewhat extensive travels with long stops and continuous examinations of many of the localities in Europe occupied by paleolithic man, especially among the caverns of the Dordogne district; my personal acquaintance with most of the collections of paleolithic implements made in these countries; my association with the leading investigators and believers in paleolithic occupation, have fitted me in a degree to judge of the subject which it would be mock modesty on my part to deny; while my dozen years' service in the prehistoric department of the U. S. National Museum, gives me an acquaintance with the American specimens by which I may compare the specimens from the two countries in a peculiar manner which I hope is not without its value.

The original discovery of a paleolithic period was made in Europe. The determining characteristics of that period have been decided only in Europe, and it must be principally by comparison with the evidence there that we are to determine the existence of a corresponding period in America. This evidence is furnished (in Europe) largely by geology and by paleon-

\* Gray, *op. cit.*, p. 276.

tology. As has been described, discoveries of the remains of man, either physical or industrial (technologic), have been made in, and belong to, quaternary deposits, determined either by the geologic strata in which they were found, or the paleontologic objects with which they were associated. This species of evidence is, to a considerable extent, lacking in America. The European conditions have been found to exist in but few localities; yet America is not entirely without instances. Dr. Koch found a mammoth skeleton in Missouri, associated with which were flint weapons of human manufacture. It and the weapons are now displayed in the Berlin Museum. Dr. Dickeson found at Natchez, Mississippi, the buried skeletal remains of a megalonyx superposed on a portion of a human skeleton. The human skeleton from Guadeloupe, now at Paris, was encased in coquina, a rock made of shells belonging to the quaternary, though not exclusively so. The Iron Man of Sarasota Bay, Florida, found by Judge John G. Webb, was completely fossilized and changed to limonite. A fossilized human calcaneum was found by Col. Joseph Wilcox, of Philadelphia, in the same neighborhood with a quaternary shell forming part of the mass. Three similar instances were found in the same country in separated localities, showing them to have been different individuals; some of these have been encased in bog iron ore, others in indurated sandstone apparently as solid as though formed at the bottom of the ocean. The Nampa Image has been cited as evidence of high antiquity of man in America, and while its genuineness has been questioned, the attacks upon it are far from being successful.

The Calaveras skull has been the subject of much hilarious scientific criticism bordering on contempt. The facts of its discovery should be subjected to painstaking and detailed investigation before the results of

those facts are assumed. Whatever may be the conclusions concerning the fraudulent character of this specimen based upon its alleged 'planting' by contemporary miners, as a practical joke to 'fool Professor Whitney,' it should be remarked that the evidence favoring this charge is itself open to as grave suspicions as is the rankest fraud ever perpetrated. The geologic changes of that country have been so great, that it requires the gravest consideration and an intimate study or knowledge of all the facts before any one is justified in passing upon the archeologic question. I cannot here or now investigate the subject from either of these view points. I am not a geologist and I have never visited the locality. I can only suggest some of the points to be considered before a conclusion is reached, and raise a warning or danger flag to those who would decide against the authenticity of the specimen on insufficient or *a priori* grounds.

The Stanislaus river, at the time of the deposition of the lava and gravel in which the skull was found, ran down the side of Table mountain in the same neighborhood in which it now runs, but its valley was then some fifteen hundred feet higher than at present; that is, since the valley of the Stanislaus was choked up and the water turned aside by the eruption of lava and the deposit of cemented gravel, the deflected river has cut or eroded a new channel fifteen hundred or more feet deeper into the earth than was the earlier channel. This will give some idea of the immensity of time and the great surface changes with which we have to deal. Many implements and objects of undoubted human origin have been found in divers localities in California, alleged to have been imbedded in the same kind of gravels and to have formed part of similar deposits. It is part of the argument against the Calaveras skull to assail the authenticity of their discovery. First it was

charged that these finds were made by miners, laymen, ignorant and unaccustomed to recognize or describe them with scientific accuracy; but this was answered when Professor Clarence King, then head of the Geological Survey of the United States, and the highest scientific authority, found one of the pestles *in situ*, imbedded in the cemented gravel under the lava cap, that he recognized its character before he exhumed it, and in view of the importance of the question involved, proceeded with care to dig it out. He preserved it, brought it to Washington, and placed it in its lawful depository, the U. S. National Museum, where it now is. It is remarkable that similar implements and objects to the number of about three hundred should have been found, alleged by their finders to have been dug out of the gravels under the lava cap in various localities in California—it is remarkable, I say that these should all have been frauds, and their finders either swindlers and liars, or else have duped themselves by their own discoveries. California miners have been generally credited with more astuteness than to be their own dupes, while it is curious if a whole state or a whole class within a state should combine in a general swindle and lie, out of which no profit, present or prospective, was possible. The objection has been made that these implements are polished or ground, at least pecked or hammered ready for polishing, therefore belong to the Neolithic or polished stone age; and this it is alleged is incompatible with their great antiquity. Some American archeologists assert that chipped stone implements were more difficult to make than polished ones, and on the well-recognized principle that the simplest and easiest way was the earliest, while the more complex and difficult ways came later, they insist with pertinacity that European classification is erroneous, and that the relative chronological positions

of the Paleolithic and Neolithic ages should be reversed. This view, if accepted, would satisfactorily explain the apparent anomaly of the California implements. The real answer to this objection is that we know but little concerning California prehistoric archeology. It presents many problems which have not been solved, nor indeed do we seem to be in the way of solving them. Some of these are as follows :

The Indian languages of the Pacific slope have peculiarities as yet unexplained. A fringe of country lying between the coast range and the ocean contains a greater number of stocks or families of languages (29) than all the rest of North America combined.\*

The reason for this has never been explained even theoretically or tentatively. The arrowpoints and spearheads of the Pacific Coast are notably different from those of other parts of the country. To such extent is this true that in my classification of these implements and weapons† I was compelled to make a separate class for the accommodation of the implements from this district. Pottery, forming the most serviceable, and which might be considered the most important, domestic utensils, and as such used by nearly all prehistoric and primitive peoples, makes complete default on the Pacific Coast; this, too, while their neighbors, the natives of Mexico and the Pueblo country, even the wild and savage Papagos, make and use it continually, some being of the largest forms with the finest decorations. Basketry in some cases supersedes pottery for carrying liquids, and the finest in America and perhaps in the world, either in ancient or modern times, are to be found on the California coast.‡

\* See Major Powell's Linguistic Map; Seventh Annual Report of the Bureau of American Ethnology, 1885-86, pp. 7-142.

† Report of the U. S. National Museum, 1897.

‡ See the Hudson Collection just purchased by and now in the U. S. National Museum.

The ollas (carrying or cooking jars taking the place of pottery) are made of stone (serpentine) instead of clay. These are some of the California anomalies. When the problems presented by them have been satisfactorily solved, that relating to polished stone implements may not appear so difficult.

It has been objected that the stone implements of seemingly so high antiquity were not water worn and bore no traces of long or distant transportation by the mountain streams. An answer is patent. There is no evidence that they were transported or rolled any distance by water, and until this fact be established, there is no need to attempt the demonstration of its cause. We should establish the fact before we explain its cause.

The study of California archeology, in order that it be satisfactory, requires a union of three scientists: the archeologist, the geologist, and the historian who shall act as lawyer and judge. The Calaveras skull incident has closed, has passed into history, and its facts are to be determined by evidence, the same as any other fact in history. The first question is, did Mattison actually find the skull as he says he did? and second, had it been planted in order to 'fool Professor Whitney'? I think if this issue was made up to be tried before a court and jury on the lawful evidence submitted, the answers would be in the affirmative on the first question and negative as to the second. Until this issue is determined, it is folly to try the case by popular clamor and to denounce its possible believers or pour vials of contempt and contumely upon their heads.

Because I have favored the authenticity and genuineness of specimens which have been assailed, I would not have it understood that I am deluded into the belief that all specimens are genuine. I recognize that frauds have been committed, that

fraudulent specimens have been manufactured, planted, dug up and sold as genuine, and that great deceptions have been practiced. I have not hesitated to attack and destroy their claims whenever presented. But I here contend that in passing on the genuineness of specimens, we should decide fairly and honestly. We should first get possession of all the facts, sift them to their last residuum of truth, and, giving each fact its fair and due weight, decide the question according to our best and truest judgment. This should be done 'without prejudice or preconceived opinion.' It is unfair to decide such questions in advance of knowledge of the evidence; it is unscientific to decide *a priori* that so-and-so is true because it must be true, and so-and-so is not true because it can't be true. I heard one who claimed to be a prehistoric anthropologist say that he would not believe a certain object to be a genuine find if he had found it himself. It is obviously impossible to argue with, much less convince, such a man. In determining these contested questions, I have ever sought to be impartial and, above all things, honest. It is only thus that we can hope to arrive at the truth.

Boucher de Perthes's discovery of paleolithic implements in original and undisturbed quaternary river gravels has been described in its appropriate place in this address.

After the proposition that these were remains of human industry had been accepted, the European investigators drew deductions based on the similarity of objects and implements found in other localities where the geologic or paleontologic evidences were not so plain or so plentiful, and the finding of paleolithic implements alone has been accepted as evidence of human occupation during that period. The same practice has been pursued in America. The deposit at Trenton, New Jersey, is accepted by geologists as belong-

ing to the quaternary period; and while the finding therein of paleolithic implements or human remains has been disputed, it seems to have occurred so often, and these finds to have been so numerous that it cannot long continue to be denied. The discovery of a mammoth tusk in the Trenton gravels, now on exhibition at Rutgers College, New Brunswick, N. J., is confirmatory evidence not to be overlooked or lightly regarded. I do not propose to enter into a discussion of the weather beaten subject of the Trenton gravels. I presented a paper before this section at the Detroit meeting,\* by which I still stand. The same sort of evidence is furnished by the Tuscarawas specimen found by Mr. Mills in the glacial till of Ohio, and described by Professor Wright.† Likewise the implement found by Dr. Hilbourne T. Cresson, Delaware, and made the subject of a paper by Professor Wright, read before this Section at this meeting.

The chapter on High Plateau paleoliths deals with paleolithic chipped flint implements found in England on the surface; others of the same nature have been found, still on the surface, in France on the high plateaux between the rivers Seine and Yonne. These have been recognized by every one who is competent to have an opinion, as true paleoliths. The same condition applies to certain localities in the United States, that is to say, on the plateaux on the headwaters of certain rivers beyond the erosion by which the valleys were formed. So there have been found on the surface in the United States many chipped flint implements which from their size, shape, appearance and mode of manufacture, are identical to the smallest detail with the

\* Published in Volume XLVI., 1897, pp. 381-383, of the Proceedings.

† *Popular Science Monthly*, July, 1891, Vol. XXXIX., No. 3, pp. 314-319. *Man and the Glacial period*, pp. 251-3.

recognized paleolithic implements of Europe. These are dissimilar to the prehistoric implements of every other period in any country, and if there is any force or truth in the argument of similarity of culture from, or by reason of, similarity of implements, between two widely separated peoples using them, this would seem to establish the existence of a paleolithic period in America as well as in Europe. Dr. Brinton and Professor Putnam, though occupying antagonistic positions on many of these questions, both seem to concede the antiquity of man on the American continent.

Dr. Brinton's address heretofore mentioned, contains two or three pregnant sentences on the subject of man's antiquity in America which, coming from him, are noticeable, and I quote them approvingly :

There is, however, a class of monuments of much greater antiquity. \* \* \* These are the artificial shell heaps which are found along the shores of both oceans and many rivers in both North and South America. They correspond to the kitchen middens of European archeology. \* \* \* The shells are by no means all of modern type. Many are of species now wholly extinct, or extinct in the locality. This fact alone carries us back to an antiquity which must be numbered by many thousands of years before our era. \* \* \* This class of monuments, therefore, supply us data which prove man's existence in America in what some call the diluvial, others the quaternary, and others again the pleistocene epoch, that characterized by the presence of extinct species.

Professor Putnam, in his address at this meeting said :

That man was on the American Continent in quaternary times, and possibly still earlier, seems to me as certain as that he was in the Old World during the same period.

#### *Antiquity of the Red Race in America.*

Not to split hairs over names, I suppose we should all agree upon the generic name of 'Red Race,' and as I have some definite opinions as to the antiquity of the red race in America, I may make a *résumé* of my position.

If we accept the theory of the unity of the human species and its origin from a single stock, we must agree that the human species either originated on the Western Hemisphere and migrated to the Eastern, or else the reverse. Whether it originated in America or came here by migration, the conclusion seems irrefutable that it started with but comparatively few individuals, they occupied but one, or few localities, they grew to have practically the same industries, and they spoke practically the same language. Professor Putnam\* contends that there was more than one race and so there may have been more than one migration and more than one colony. This, if accepted (and I make no dispute over it), does not materially affect my proposition. There were surely but few colonies with but few members in each. From these small beginnings, the red race had, prior to the discovery of America, spread over the entire Hemisphere, from the Arctic Ocean to Terra del Fuego, and from the Atlantic to the Pacific; it had increased, we can only suppose in the natural way, from a single pair or score or possibly a hundred individuals, to the seven or eleven millions which are said to have been the numbers at the time of Columbus's discovery; and their migrations had been sufficiently extended and the separation sufficiently pronounced and maintained, as that the language originally spoken had increased to the great number of which we now know.†

There is a difference or distinction in the ground or polished implements and objects of the ancient man of North America, which indicates a high antiquity. The Indian made and used, at the time of the discovery, certain implements and objects

\* See his Presidential Address.

† The Bureau of American Ethnology estimates the number of the different stock languages at fifty-six among the American Indians; while the number of dialects is estimated at two hundred and over.

which have been continued in modern times by which he can easily be recognized and identified. Many of these are of the same type as those in Europe in neolithic times. But there are certain others, also ground, polished and drilled, some showing a high order of mechanism, art and industry, which had gone out of use and had become prehistoric among the Indians themselves. They have been found in mounds and show a pre-Columbian and ancient origin. The objects referred to are usually of the class termed ceremonial: banner-stones, bird-shaped, boat-shaped, spade-shaped, gorgets, tablets drilled or inscribed, sinkers, pendants or charms, tubes and certain specimens of stone pipes. The mounds themselves indicate a great antiquity, but their building and use seems also to have continued into later and possibly into modern times. The antiquity of the mounds has been a subject of great contention, but I refer to a foregoing quotation from Dr. Brinton,\* and also the address of Professor Putnam delivered at this meeting (p. 73), where he says:

Many of these shell mounds are of great antiquity \* \* \* and cannot be regarded as the work of one people. \* \* \* Thus it will be seen that the earth mounds, like the shell mounds, were made by many people and at various times. \* \* \* So far as the older earthworks, such as Newark, Liberty, High-bank and Marietta group, the Turner, the Hopewell group, the Cahokia mound of St. Louis, the Serpent mound of Adams County, Forts Ancient and Hill and many others, have been investigated, they have proved to be of considerable antiquity. This is shown by the formation of a foot or more of vegetable growth upon their steep sides, by the primeval character of the forest growth upon them, and by the probability that many of these works, covering hundreds of acres, were planned and built upon the river terraces before the growth of the virgin forest.

If the above facts in regard to the origin of man on the Western Hemisphere be accepted as true (and it is difficult to see how

they can be evaded), the conclusions announced of the minimum high antiquity of man in America seems incontrovertible; and I am glad to stand with Dr. Brinton and Professor Putnam in maintaining the same conclusion, however much we may differ as to the arguments by which it is reached.

We have assumed a migration from the Eastern Hemisphere as a means of accounting for the human occupation of the Western; how it comes that the human product in the Western Hemisphere should be different from its progenitors in the Eastern, is not involved in this discussion. The question belongs to the earlier one of the origin of races. If we question how the Red Race of America could have sprung from either one of the three or four races of the Eastern Hemisphere, we are involved in equal obscurity as to how the three races of the Eastern Hemisphere should have sprung from a single stock, assuming, as we have, the unity of the human species. The discussion of this question is not here pertinent; it belongs to another branch of the science of anthropology and is to be discussed otherwheres. If we accept the theory of the unity of the human species and that they all sprung from one stock, the conclusion may as well be accepted as to the formation of the Red Race in America, as to the Yellow in Asia, the White in Europe and the Black race in Africa. The problem of the peopling of America has been dealt with theoretically by M. de Quatrefages in his 'Historie Generale des Races Humaines,' wherein he assumes a combination of thirty individuals of the Yellow, twenty of the White, and ten of the Black race, who, placed on the common basis of an isolated colony anywhere in the Western Hemisphere would, by amalgamation and procreation, produce a race with the principal characteristics of the Red.

\* Ante, p. 73.

*Migrations of the Red Race in America.*

Continuing our stand on the theory of the unity of the human species, we recognize that all the different races must have sprung from one stock, and this could have been done only by the most intimate physical connection. No theory of similarity of human thought and need will even assist in explaining this fact. The difficulties of migration all disappear before it; distances of time and place are as nothing. On the basis that the human species sprang from a single stock, the conclusion is not to be evaded that all the races, the Red among the rest, descended from the stock, generation after generation, from father to son and from mother to daughter; and this must have been true from the time of the first human pair down to those born in A. D., 1899. This proves the communication and relationship between all individuals of the human species and *a priori* that all human occupation of different countries, or passages from one country to another must have been accomplished by migration.

On this subject Sir John Lubbock (*Prehistoric Times*, p. 587) says :

Assting, of course, the unity of the human race, there can be no doubt that men originally crept over the earth's surface, little by little, year by year, just, for instance, as the weeds of Europe are now gradually, but surely creeping over the surface of Australia.

On this assumption, the questions of human migration, and with it the migration or importation of human industries, settle themselves. If the people migrated, they carried their industries with them. Their knowledge of implements, utensils and weapons, and how to make them, ought to be substantially the same in both countries, the country of immigration as in the country of emigration, and this we find to be true.

If the prehistoric man migrated from the Eastern Hemisphere to the Western, and

commenced his occupation at the early period, the Paleolithic, as suggested by Dr. Brinton and as indicated by the possible existence here of paleolithic implements, he must have brought with him the knowledge of paleolithic industries, whatever those may have been. He may have come over in the Paleolithic period and had either a continued communication or a renewal of the migration. If his migration or the renewal thereof was not until the Neolithic period, then he brought with him the knowledge of that period. If we are to determine this by the similarity of industries, we would say that the last migration in prehistoric times was during the Neolithic period. Waiving for the moment any discussion as to whether the man of the Neolithic period was still in the savage stage of culture or had advanced to the barbaric, it is remarkable that the industries between the two countries should have been so nearly identical. Nearly every industry that would belong to a savage or barbaric people which might be regarded as necessary to their comfort if not their existence, is found in both Hemispheres, and in both substantially alike. In many industries, that is in the making and use of many implements, utensils, or weapons, they were exactly alike. There was in these cases, an absolute identity; the differences were not greater between the implements, etc., of the two Hemispheres than between those of any two countries in the same Hemisphere.

*Similarity of Human Culture no Evidence of Similarity of Race, but is of Communication.*

The similarity between man's culture in Europe during the Neolithic period, and that in America during the pre-Columbian period, extended to nearly every industrial object of importance relating to the lives of the two peoples. Nearly everything relating to tools or implements which one gen-

eration or one people could teach another, existed in both countries. I speak, not of the tastes, habits, customs, folk-lore, games, traditions, religions, beliefs, etc., which may or may not have been continued from one country to another, these may have perished or been lost in transmission; but I speak of the serious things of life, those which go to make epochs of culture, which determine civilization, questions involving sustenance of life, such as implements, utensils, weapons, the means by which life was maintained and made possible. I may speak, also, of the tools with which these implements were made and the method of their manufacture.\* The lines on which this parallel are drawn are so broad as to include practically all savage or barbarian needs. The industries of chipping, battering, pecking, grinding, polishing, sawing and drilling were all applied to stone, bone, horn and wood, and were identical in Europe and America. The implements made from these materials and by these methods were similar, if not identical, in the two countries: stone hatchets, bow and arrows, spearheads, knives, scrapers, grinders, mortars and pestles, gouges, chisels, hammers. There is not more difference between these tools in the two Hemispheres than there is between them in any two countries in the same Hemisphere. A series of polished stone hatchets from Scioto Valley, Ohio, will, save only the difference in material, correspond favorably in form, size, mode of manufacture and possible use, with a like prehistoric series from almost any other country in the world. The same is true of all the implements mentioned in the list above. Pottery, which figures so extensively in the life of primitive man, was substantially the same in the two Hemis-

pheres; spindle-whorls and thread, on which depended the art of weaving, and all the paraphernalia of nets and snares for catching game; these, like the others, were practically the same in both Hemispheres. There were differences in size, weight, material and ornamentation, but throughout the prehistoric period, they were substantially the same utensils. We find plenty of prehistoric weaving, more in Europe than in America, probably because the latter peoples wore clothing and made tents of skins; but the invention and use of the loom by which the product of the spindle-whorl could be utilized, was a machine of great intricacy and difficulty of manufacture. This intricacy and difficulty becomes magnified when we consider that the loom and the spindle-whorl form together but parts of the same machine and that to a large extent each depended on the other. When we find the machines and their products practically the same in both countries, it is an argument of great weight and carries with it a power of conviction.

One of the important industries in primitive life, whether savage or barbarian, was the treatment of skins of animals for tents or clothing. The first and most necessary implement for the treatment of skins is the scraper, and this is as true of the modern tannery as it was in the time of the shepherds on the plains of Chaldea. The scrapers of Europe and America are identical. The skins of prehistoric times in both countries, whether of tents or of clothing, have perished, and no traces of them are found; but the flint scrapers remain as a satisfactory and convincing evidence of the treatment of the material, and that in this, the early men of Europe and America were alike.

Lest some critic should pick a flaw in the foregoing statement of facts, I mention the teshoa, a kind of scraper peculiar to the foot-hills on the eastern slopes of the Rocky

\* The architecture and possibly the sociology of the Aztecs in Mexico and the Incas in Peru should be excepted from this general statement and subjected to special investigation.

Mountains. It has been described by Professor Leidy, and specimens have been sent to the museum by Col. P. H. Ray. They were spauls from boulders, with a sharp edge, and were knocked off by the Indians during their buffalo hunts, used temporarily and left. This is believed to be the only exception to the universality of the stone scraper of the Neolithic age anywhere throughout the world.

Speaking of the similarities between the industries and implements of the two Hemispheres, I have used the term 'identical,' and the word is correct. There may be a difference in detail, arising from the separation of time and distance, but with all that, they were the same industries, the implements were the same, made of the same kind of material, by the same process and to serve the same purpose. If there is a difference between these industries and objects in the two Hemispheres, it is like the difference between the present fashion in dress in France and in the United States. But there will be a difference between the fashions of Paris and London or, to make it more patent, between the city-folk and the peasants, whether of France, Holland, Sweden, Scotland or Ireland. So are there differences between the fashions of the various cities or states in the United States; yet in all these countries, among all these peoples, however widely separated they may be, the difference is only of fashion; and all the costumes worn are at last the same articles of dress. This is a fair illustration of the differences between the stone hatchets or the arrowpoints and spearheads of prehistoric times in the countries named.

In Europe the stone hatchet was inserted in its handle, though there may have been variations of the mode of fastening. Arrived in America, we find the same stone hatchet, handled also by insertion. When the European neolithic man wanted an axe or a heavier chopping or splitting implement,

he drilled a hole through the axe and inserted a handle, sledge-fashion. The prehistoric American did not adopt this style. He made a groove and tied a withe around his axe. This was a difference in detail between the style of implement of the two countries. It was not because the European man did not know to make a groove and put a withe around it, for his mining tools were made in that way; nor, on the other hand, was it because the American could not drill a hole in stone, for he drilled as much and as finely as did the European.

There were other differences of detail. The pottery of America may be larger and more finely made, but in both Hemispheres the processes were practically the same. There is as much difference to-day in pottery making establishments in adjoining shires or counties in either of the two countries, as there is between the countries themselves.

Ornaments of stone and shell may be different in the two countries, but they are at last but ornaments, and as such have their local fashion.

There may be other differences with other implements and industries, but they are of degree rather than of kind. I may fairly stand by the proposition that there will be found as great differences between the primitive or prehistoric industries, for example between those of the Atlantic and Pacific Coasts of America, between those of the United States and Mexico and Central America, as will be found between those of Europe and America; so, also, will there be as much difference between the industries and implements of the dolmen people and the lake dwellers, or between those in the Scandinavian and the Iberian Peninsulas.

Basketry may serve as an illustration. We have just received, at the U. S. National Museum, a fine collection of primitive basketry from California, representa-

tive of the Pacific Slope. It differs greatly from the prehistoric basketry of either Europe or the Atlantic Slope in that it is much finer and better made, but the stitches and plaiting are on the same general system and done in the same general style. While the difference is marked it is at last one of detail and may be explained. A theory by which the present difference may be explained is that the art became perfected in California, not alone since the migrations from Europe, but since the establishment of the Indians on the Pacific Coast, while it has died out on the Atlantic Coast.

Bronze found no lodgment in North America. A good explanation is that the migration from Europe by which America was peopled, took place prior to the advent of the bronze there. There might have been more than one migration to America; one during the Paleolithic and a later one during the Neolithic period; but it seems not to have been repeated after bronze became known in that country.

The principles which underlie this argument of similarity of industries as proving migration or communication or contact, do not depend alone upon the similarity of the objects, but also upon the difficulty of manufacture and performance, the intricacy of the operation required, the skill of the workmen; and to these may be added the closeness of resemblance, the similarity of detail, and the number of repetitions. A single specimen, or a few specimens having only an insignificant or uncertain similarity, might be of no avail in establishing the proposition of migration or communication of peoples between the countries; while, as the resemblances are increased, and an increase in the intricacies of manufacture, in the difficulties of performance, in the skill required to make or operate the tool or machine, would very materially increase the testimony in favor of migration, and add weight to the evidence.

The theory that the similarities of human thought account for the similarities of human culture in widely separated countries and among peoples without prior communication, savors of gross materialism, and is to be rejected as erroneous. That there are similarities of human thought is to be admitted, but if these control man in his progress and compel his passage in a materialistic or predestined path, they rob him of his free will and make him only a creature of circumstances. The best illustration I can suggest proving the error of this theory, is the action of human thought as manifested in human speech or writing. We may assume that human emotions, feelings, desires and wishes are much the same among all people. Each human being loves weeps, pities, hates, envies, etc., much the same as does every other. If they were to describe their feelings, one might expect to find it done in much the same language. Yet we know, for a fact, that this is not so. If so done, it is charged as plagiarism. Of the thousands who have thus written, scarcely a 'baker's dozen' have ever been thus charged. The reason most apparent is that with all the similarity of human emotions, feelings, desires and wishes, the expressions thereof are so different when emanating from different authors that none lay themselves open to such a charge.

I am opposed to the theory advanced by certain anthropologists, that the similarity of human thought is a satisfactory explanation of the similarity of human culture in the case of widely separated peoples. That there is similarity of human thought between peoples, however widely separated, is conceded; but this theory is employed to account for the similarities of human culture otherwise than by migration, contact or communication. I prefer to account for similarity of culture (especially industrial) among widely separated peoples by migrá-

tion, or by communication or contact. If we accept the doctrine of the unity of the human species, we are forced to admit contact between peoples of different countries as accounting for the differences in their cultures rather than to account for it by the similarity of their respective thoughts. The race could not have been perpetuated, the new peoples could not have been born, the different countries would never have been peopled, whether separated or not, except on the theory of migration and communication or contact. It is only by contact that subsequent generations could have appeared, and only by migration that they could have become separated. If the spread of culture by migration is denied, the spread of the race must also be denied. The two things, similarity of race and of culture, stand on the same foundation. This foundation is migration, communication, contact.

*Monuments, Burial Mounds and Tumuli.*

Nothing has yet been said as to the monuments or art of prehistoric man. The art is sufficiently explained in my work on 'Prehistoric Art'; published in the report of the U. S. National Museum for 1896, pp. 325-664, with 74 plates and 325 text figures, and I need not dwell further on it.

The monuments of prehistoric times are curious and strange. Whatever country we may consider, they excite our wonder and admiration. The ingenuity, invention, thought and general *savoir faire* of the prehistoric man as shown in his industries, and the taste and genius shown in his art, all pale before his ability as an architect and builder.

The principal monuments made by prehistoric man in most countries and times seems to have been funereal. The paleolithic man made no monuments, and it is doubtful if he habitually buried his dead.

But the neolithic man expended his energies and powers in the erection of tombs and monuments intended to protect, and possibly to commemorate, his dead.

Dolmens were chambers of stone in which the dead bodies were placed. In Europe mounds were frequently, and in America were always erected over such burials, and these stand as testimonials of the affectionate regard with which the barbarian of prehistoric, whether in Europe or America, regarded his dead.

Although these monuments may not be the same in the details of their construction in both countries, they are all founded on the same principle of regard for the dead. This remark applies equally to Europe as to America. The burial tumuli and dolmens of Lozère and Morbihan in France do not contain a greater number of bodies than those of the Turner, or the Hopewell group in Ohio; while for size, extent and complicated design and perfection of execution, those we are to see during this session at Newark, Circleville and in the Scioto Valley will equal any throughout Europe.

The military monuments, fortresses, embankments, squares, circles and breastworks of the two countries tell the same story. They were built in both countries, sometimes of stone and again of earth, and show in every quarter an amount of engineering skill. The parallel lines at Marietta and Piketon, the circles and octagons on the State camp-ground at Newark, in the Scioto Valley, and at Portsmouth, Kentucky, have their counterparts in the extensive earthworks of protective ditch and embankment of Camp Peu-Richard at Saintes (Charente); while the fortresses and camps of stone or earth of forts Ancient or Hill, or opposite Bournemouth, are but the complements of Camp de la Malle (Alps Maritimes) or the great Gaulish fortress of Uxellodunum on the Dordogne.

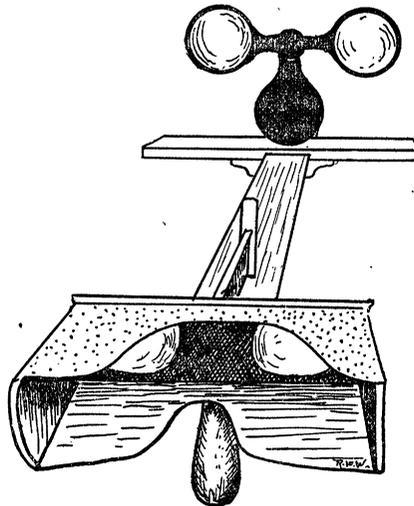
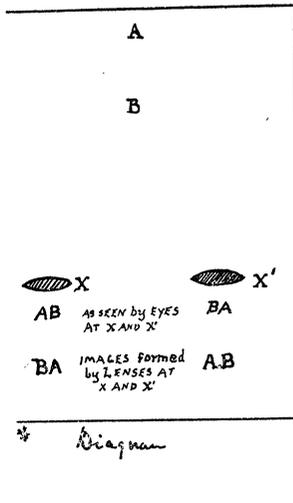
Other monuments in Europe occupy a

relatively restricted area, the menhirs, isolated standing stones, cromlechs, alignments, standing stones erected in circles, and squares or parallels. No corresponding monuments have been found in America.

I must conclude. My time and your patience are about exhausted. I recognize my shortcomings and apologize for them; but who can accomplish in one address the history of the first appearance of man on earth and, describing the discoveries of the century, reduce them to the limitations

means of a system of mirrors. I have recently devised a method of converting an ordinary stereoscope into a pseudoscope, which can be used to view near or distant objects, and which yields results far superior to the old form of instrument.

If two small lenses of equal focus (5 or 6 cms. is about right) are mounted side by side, they will form two inverted images in space lying in the same plane, of any object towards which they are directed. These images are not only inverted but have left and right interchanged, and when fused



A NEW PSEUDOSCOPE -  
Figur -

and nomenclature of a new science? The difficulty is increased when we consider that the want of harmony on these subjects is as great among our own scientists as it is between them and their foreign brethren.

THOMAS WILSON.

U. S. NATIONAL MUSEUM.

A NEW FORM OF PSEUDOSCOPE.

IN the Wheatstone pseudoscope the left eye is made to see an object from the point of view of the right eye and *vice versa*, by

either by viewing them with the axes of the eyes parallel, or by means of a stereoscope will give rise to pseudoscopic vision, as will be readily understood by reference to the diagram.

Let *A* and *B* be two points in space, *B* being in front of *A*. An eye at *X* will see *B* to the right of *A*, and an eye at *X'* will see *B* to the left of *A*, and the fusion of these two images produces stereoscopic vision, *B* appearing nearer than *A*. Suppose now that *X* and *X'* represent the two