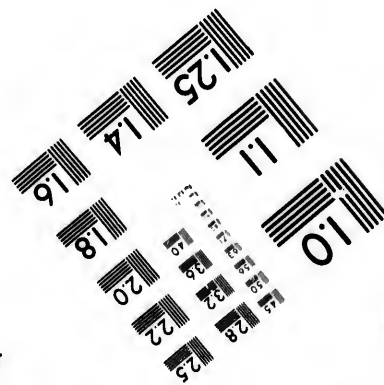
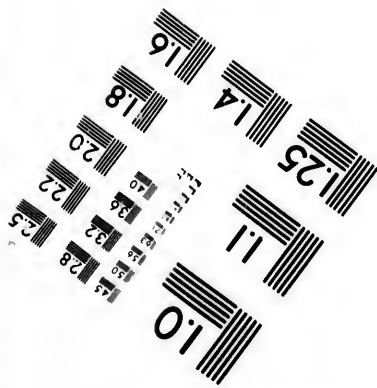
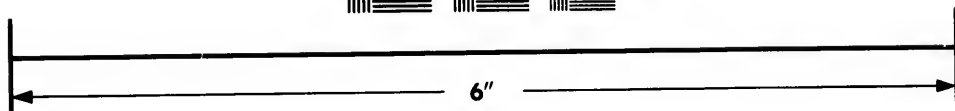
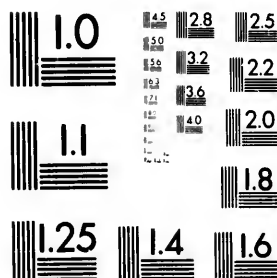


**IMAGE EVALUATION
TEST TARGET (MT-3)**



**Photographic
Sciences
Corporation**

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1981

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments:/
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Includes supplementary material/
Comprend du matériel supplémentaire
- Only edition available/
Seule édition disponible
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

The copy filmed here has been reproduced thanks to the generosity of:

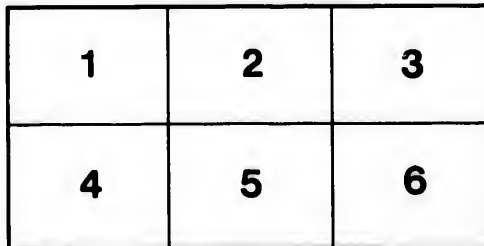
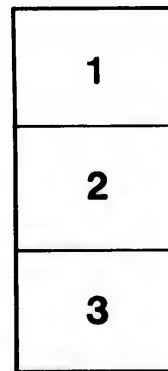
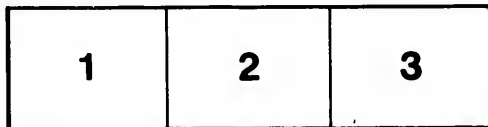
Metropolitan Toronto Library
History Department

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Metropolitan Toronto Library
History Department

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

ails
du
difier
une
nage

rata
o

elure,
à

b30

EVIDENCES OF THE ANTIQUITY OF MAN IN EASTERN
NORTH AMERICA.

ADDRESS

BY

CHARLES C. ABBOTT,

VICE PRESIDENT, SECTION H,

BEFORE THE

SECTION OF ANTHROPOLOGY,

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

AT THE CLEVELAND MEETING,

AUGUST, 1888.

[From the PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT
OF SCIENCE, Vol. XXXVII.]

PRINTED AT THE SALEM PRESS.
SALEM, MASS.
1888.

[From t

*EVIDENCES OF THE ANTIQUITY OF MAN IN EASTERN
NORTH AMERICA.*

ADDRESS

BY

CHARLES C. ABBOTT,

VICE PRESIDENT, SECTION II,

BEFORE THE

SECTION OF ANTHROPOLOGY,

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

AT THE CLEVELAND MEETING,

AUGUST, 1888.

[From the PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT
OF SCIENCE. Vol. XXXVII.]

PRINTED AT THE SALEM PRESS.
SALEM, MASS.
1888.

~~36-27~~

A
vote
from
do w
imag
be s
hard
tion
or th
If
truth
Anti
the t
such
sider
scend
of Pa
Th
rectly
to ad
been
ox.
feel t
creat

ADDRESS

BY

DR. CHARLES C. ABBOTT,

VICE-PRESIDENT, SECTION H.

EVIDENCES OF THE ANTIQUITY OF MAN IN EASTERN
NORTH AMERICA.

AN ecclesiastical body has recently decided, by a significant vote, that man, perfect in all his parts, had been created *de novo* from the dust — that the law of evolution has nothing whatever to do with him or his ; if, indeed, it is not a very flimsy figment of the imagination, and a harmful plaything with which men who aim to be scientific, or rational, solace themselves, because, in their foolhardiness, they decline to accept the asserted initial separate creation of all living beings, from the highest to the lowest, now living or that have lived.

If this decision of an ecclesiastical body really represented the truth, instead of being a painful exhibition of stultifying ignorance, Anthropology would be shorn of much of its attractiveness, and the term "prehistoric" would have little, if any, meaning. In such a case, the races of America would scarcely be worthy of consideration, being but the rapidly degenerated and discolored descendants of the physically perfect, yet painfully weak-kneed Adam of Paradise.

There is, on the contrary, unquestionably but one method of correctly interpreting the past, as to the history of man, and that is to adopt the same methods and draw the same inferences as have been done in tracing the evolution of the horse, camel, elephant or ox. This, strangely enough, seems repugnant to very many who feel that any relationship, however remote, with less intelligent creatures is a reflection upon their own intelligence ; while, in fact,

they compromise their claim to a high intellectual standard only when they deny their purely animal origin.

To determine at what precise point in geological time, man appeared upon the earth, is, it seems to me, obviously impracticable, from the fact that the dividing line separating humanity from the non-human cannot be drawn. It were as easy to name the moment when the gloaming merges into night, or shout with confidence, now! as the dawn brightens into day. Nor is it demonstrable, with our present knowledge, to point to that country where the momentous change first took place, if it occurred but once. At present, however, we can safely say that Miocene man is extremely problematical, and Pliocene man a question as yet unsettled; the auriferous gravels of California being pronounced late Tertiary by Whitney, and by LeConte as representing "the beginning of the Glacial Epoch."

At all events, we have neolithic man as far back as the Glacial Epoch and possibly in the Pliocene. Man in the Tertiaries, therefore, championed by my honored predecessor, Professor Morse, becomes something more tangible than a hypothetical creature. Professor Putnam has pithily outlined this important subject in a recent communication to the Boston Society of Natural History. He there remarks: "When we compare the facts now known from the eastern side of the continent, with those of the western side, they seem to force upon us to accept a far longer occupation by man of the western coast than of the eastern; for not only on the western side of the continent have his remains been found in geological beds unquestionably earlier than the gravels of the Mississippi, Ohio and Delaware valleys, but he had at that early time reached a degree of development equal to that of the inhabitants of California at the time of European contact, so far as the character of the stone mortars, chipped and polished stone implements, and shell beads, found in the auriferous gravels, can tell the story. On the Pacific coast, where the conditions of life were more favorable, he had passed beyond the palæolithic stage before his works were buried in the gravels under the beds of lava; while at a later period on the Atlantic coast he was still in the palæolithic stage. Either this must be accepted, or else the geological changes on the Pacific coast have been entirely misunderstood; for we can no longer question the many instances of the discovery of the works of man, and also of his bones, in the Californian gravels. The

sam
foun
in N
M
stan
cific
Miss
M
full,
tions
1879
work
comm
tiquit
lame
better
The
depos
ward,
ufactu
the co
on the
deeply
be tha
meltin
it was
the qu
additio
flooded
less ma
ice-she
But in
much o
to a ch
At such
dustry.
In 18
from N
predicte
ter stat

same story is told by the beautifully chipped implement of obsidian found by Mr. McGee in the quaternary deposits of Lake Lahontan in Nevada."

Man in America, therefore, must be studied from a geological standpoint; and not only, as we have seen, is this true of the Pacific coast, but signally so, when, coming eastward, we reach the Mississippi.

Mr. Warren Upham has, during the present year, published in full, a lucid account of his careful examinations of the drift formations at, and in the vicinity of Little Falls, Minnesota, where, in 1879, Miss Babbitt found those extremely rude but unquestionably worked quartzes, concerning which there has been much needless comment, unfavorable to their human origin or their asserted antiquity, even from presumably learned sources; and of course, lame attempts to belittle the discovery by those who should know better are still heard.

The conclusion of Mr. Upham's paper is as follows: "While the deposition of the valley-drift at Little Falls was still going forward, men resorted there, and left, as the remnants of their manufacture of stone implements, multitudes of quartz fragments. By the continued deposition of the modified drift, lifting the river upon the surface of its glacial flood-plain, these quartz chips were deeply buried in that formation. The date of this valley-drift must be that of the retreat of the ice of the last glacial epoch, from whose melting were supplied both this sediment and the floods by which it was brought. The glacial flood-plain, beneath whose surface the quartz fragments occur, was deposited in the same manner as additions are now made to the surface of the bottom-land; and the flooded condition of the river, by which this was done, was doubtless maintained through all the warm portion of the year, while the ice-sheet was being melted away upon the region of its head-waters. But in spring, autumn and winter, or, in exceptional years, through much of the summer, it seems probable that the river was confined to a channel, being of insufficient volume to cover its flood-plain. At such time this plain was the site of human habitations and industry."

In 1883, as the result of exhaustive studies of glacial deposits, from New Jersey westward, across Ohio, Rev. G. Frederick Wright predicted that traces of paleolithic man would be found in the latter state. Commenting upon such evidences as occurring else-

where, he remarks: "Man was on this continent at that period when the climate and ice of Greenland extended to the mouth of New York Harbor. The probability is that if he was in New Jersey at that time he was also upon the banks of the Ohio, and the extensive terrace and gravel deposits in the southern part of our state should be closely scanned by archaeologists. When observers become familiar with the rude form of these paleolithic implements they will doubtless find them in abundance."

Paleolithic implements, concerning which there can be no doubt, have not been discovered in abundance as yet, but Professor Wright's belief proves to have been well founded. Dr. C. L. Metz of Madisonville, Ohio, has discovered two specimens which set the matter at rest. Both were found at significant depths; one of them, nearly thirty feet below the surface. The region, where found, is one characterized by immense gravel deposits of glacial age and origin. They have been carefully studied and reported upon by Prof. Putnam and by Mr. Wright, who remarks, in conclusion, with reference to the discoveries of Dr. Metz:

"In the light of the exposition just given, these implements will at once be recognized as among the most important archaeological discoveries yet made in America, ranking on a par with those of Dr. Abbott, at Trenton, N. J. They show that in Ohio, as well as on the Atlantic coast, man was an inhabitant before the close of the glacial period. We can henceforth speak with confidence of interglacial man in Ohio. It is facts like these which give archaeological significance to the present fruitful inquiries concerning the date of the glacial epoch in North America. When the age of the mound-builders of Ohio is reckoned by centuries, that of the glacial man who chipped these paleolithic implements must be reckoned by thousands of years."

Mr. Hilborne T. Cresson will, at this meeting, present notices of his discovery of two chipped implements of argillite which he found *in situ*, at a depth of several feet from the surface, in railroad cuttings through the old terrace of the Delaware river in Claymont county, Delaware. The geological position of these specimens will excite discussion, but their great age will not be questioned. Of particular interest in relation to discoveries in the gravels at Trenton and Ohio, is the discovery of a large flint implement found by Mr. Cresson in the glacial gravel in Jackson county, Indiana. An account of this specimen will also be presented to this section dur-

ing
to
of
por
Oh
bri
oth
I
No
Wh
stil
folk
ries
to
tre
spe
wea
and
lim
don
sissi
fact.
W
mean
was
preë
heoli
in th
they
India
As
archa
devot
regio
the tr
quest
The
ing th
self o
mysel

ing the meeting by Prof. Putnam for Mr. Cresson. I am permitted to call attention in advance to these new facts in the distribution of palaeolithic implements, and I may add that it is of extreme importance that these rude implements from New Jersey, Delaware, Ohio, Indiana and Minnesota are in the Peabody Museum at Cambridge, where they can be freely studied and compared with each other and with the specimens from the gravels of the old world.

Nor are these instances of the discovery of palaeolithic man, in North America, all that are upon record; but are they not enough? Why, indeed, should the bare mention of the poor fellow's name still excite a sneer? There will probably always be over-cautious folk who will only accept *cum grano salis*, the Man of the Tertiaries, however eloquently he may be plead for; but no one willing to accept other testimony than his or her own eyes—often the most treacherous of guides—can in fairness turn their backs, when we speak of that primitive chipper of flinty rock, who, with no other weapon, at least, held at bay, the savage beasts of primeval times; and who, with a cunning that is ever better than mere strength of limb, proved a powerful foe of both the mammoth and the mastodon. Such a man stands out in the geological history of the Mississippi and Ohio valleys, not as a dim shadow, but a substantial fact.

Was he confined to these two portions of the country? By no means. On the contrary, it would appear that as either seaboard was neared, his numbers increased, and that as a coast-dweller he preëminently flourished. In the valley of the Delaware river palaeolithic man has left such abundant traces of his former presence, in the form of rudely-fashioned stone implements, that for long they were considered as the hasty or unfinished work of the later Indians.

As the first to point out what is now maintained by competent archaeologists to be their real significance, I may be pardoned for devoting the conclusion of my address to a consideration of that region—the Delaware valley—so far as its physical character and the traces of prehistoric man found there have a bearing on the question of the antiquity of Man in America.

The literature of the subject is now so considerable—not including the inanities of the ignorant—that a brief résumé would of itself outreach reasonable limits, and I purpose therefore to confine myself more particularly to the results of my own work. But do

not suppose that others have not carefully gone over the same ground. Shaler, Belt, Whitney, Wright, Pumpelly, McGee, Carvill Lewis and our State Geologist, Cook, as geologists are practically one in their view that the gravel deposits are so far ancient as to be very significant as to whatever traces of man or other mammals, they may contain; while Dawkins, Tylor, Putnam, Morse, Haynes, Wilson and De Costa have all been more or less successful in finding traces of palæolithic man in this river valley, and admit without qualification, his former presence.

The question may now be asked, what is a palæolithic implement? It is not very readily defined as there is considerable variation in the shape; but as I understand the significance of the term, it is properly applied to coarsely chipped masses of flinty rock upon which a distinctly designed cutting edge is formed, to which is often added an acute point. Furthermore, they show unmistakable evidence of antiquity by the weathering of their surfaces, and they are found as a rule, but not necessarily always, in deposits of glacial or river drift with which they agree in age.

How far do these Trentonian Implements meet with these requirements? As their discoverer, I prefer to give the opinions of others, rather than my own. This is what Dr. M. E. Wadsworth, the lithologist has said of them: "Certain of these specimens were placed in my hands in 1876 for examination, their lithological character then being unknown. They were found by macroscopic and microscopic examination to have been made from argillite, greatly indurated, and breaking with a conchoidal fracture. The specimens were weathered to a greater or less extent and showed plainly that the fractures must have been made long ago. A few small fractures of secondary character occur. This secondary chipping evidently took place long after the original fracturing, but also long ago, as is shown by the weathering of the surfaces of both the primary and secondary fractures. The few secondary fractures are probably natural, and could easily occur if subjected to the action Dr. Abbott supposes. The original chipping could not have taken place by any known natural causes acting upon rocks, so far as the writer has any knowledge. Of course it then brings us to the only agency that could do the work—man. The characters of the specimens, petrographically, bore out the statements made to me by Mr. Putnam, of the conditions under which they were found, whether upon the surface or in the gravels. I do

not see how it is possible that such correspondence of characters could exist unless the specimens were found under the conditions reported.

The lithological characters then show that the specimens are not natural forms; that being composed of a slow weathering rock, they must have been made long years ago; that many years later they were subject to other conditions, probably natural, by which part have been modified; that since then, they have lain for many, many years exposed to weathering agencies; some showing that they have been subject to this action while lying on or near the surface, and others while buried to some depth.

Their weathering corresponds to that observed on pebbles of similar composition in gravels elsewhere. It is to be remembered that all the weathering has taken place since the Abbott specimens were originally clipped.

The term weathering, as here employed, means the alteration and decay that have taken place on the *surface* of the *specimen*, but does not imply that it has been exposed on the *surface* of the *ground*; it may or may not have been; the weathering itself shows with greater or less clearness whether this occurred from surface exposure or not.

Part of the specimens shown me bore evidence that they had originally been exposed to weathering on the surface of the ground and been covered since, but the covering evidently took place ages ago, if the weathering that they have been subjected to since is any criterion.

The term "argillite," as employed by me, is used to designate all argillaceous rocks, in which the argillaceous material is the predominant characteristic; slate or clay-slate, clay-stone, etc., are simply varieties of it, the term slate being only rightfully used when slaty cleavage is developed. The argillite out of which these specimens were made has no trace of cleavage."

According to Professor Haynes, a skilled observer, who has given much time to the study of palaeolithic man in Europe, as well as in this country, "the term palaeolithic is primarily restricted in meaning to such objects . . . when met with under peculiar geological conditions; that is to say, when found embedded in the gravels which have been deposited by certain rivers during the period known to the geologists as the quaternary or pleistocene period. At that time their volume of water was much greater

than it now is, which was caused by the melting of the great ice-cap that once covered the northern portion of both continents, accompanied by a climate much more humid than we have at present. Such accumulations of gravel are often of very great thickness and embedded in them, side by side with the stone implements above described, are found the fossil bones of extinct species of animals, such as the mammoth." After mentioning, in the same paper, the various localities in Europe that he had carefully examined, he remarks with reference to the locality under consideration :

"From these various experiences I feel myself warranted in stating that the general appearance of the country and the character of the gravels at Trenton, N. J., present a most striking resemblance to what I have seen in the various localities in the Old World to which I have referred. There is the same rudely stratified mingling of coarse materials marked by a similar absence of clay Speaking . . . from an archaeological standpoint, I do not hesitate to declare my firm conviction that the rude argillite objects found in the gravels of the Delaware river, at Trenton, N. J., are true palaeolithic implements."

My own impressions of their true character was not suddenly reached. The evidence, of other kind, of the antiquity of the Indian, led me to consider them as rude objects made for some trivial purpose and discarded. Later, I became convinced that they were older than ordinary surface-found relics, and assumed that the Indian of history commenced his career in this valley while in the palaeolithic stage of culture.

Thus, while pursuing my collecting of Indian relics, it was gradually forced upon my mind that these rude implements were more intimately associated with the gravel than with the surface of the ground and the relics of the Indians found upon it.

Acting upon this, I continued for two years to examine most carefully both the surface of our fields and every exposure of the underlying gravels; and in June, 1876, after having found several chipped implements *in situ*, expressed the opinion that the Delaware river, "now occupying a comparatively small and shallow channel, once flowed at an elevation of nearly fifty feet above its present level; and it was when such a mighty stream as this, that man first gazed upon its waters and lost those rude weapons in its swift current, that now, in the beds of gravel which its floods

have deposited, are alike the puzzle and delight of the archaeologist. Had these first comers, like the troglodytes of France, convenient caves to shelter them, doubtless we should have their better wrought implements of bone to tell more surely the story of their ancient sojourn here; but wanting them, their history is not altogether lost, and in the rude weapons, now deeply embedded in the river's banks, we learn, at least, the fact of the presence, in the distant past, of an earlier people than the Indian."

Thus it will be seen that I have been fairly cautious in my statements and slow in reaching any conclusions with reference to these implements which separated them from ordinary Indian relics.

In September, 1876, Mr. Putnam, the Curator of the Peabody Museum of Archaeology at Cambridge, Mass., favored me with a visit, and together we carefully examined the river bluff below Trenton, and succeeded in finding *two specimens in situ*, such as I had previously described in the *American Naturalist*. At his request, I continue my examinations of these gravels, acting under an appropriation made by the Peabody Museum for this purpose; and, in November of the same year, submitted to him a report *On the Discovery of Supposed Palaeolithic Implements from the Glacial Drift in the Valley of the Delaware River, near Trenton New Jersey*. Still realizing how all-important it was in this matter to make haste slowly, I purposely referred to these chipped stones as *supposed* palaeolithic implements, and gave, in detail, my reasons for thus considering them.

Referring to this report, Mr. Putnam remarked, in his annual report to the trustees of the Peabody Museum, that "from a visit to the locality with Dr. Abbott, I see no reason to doubt the general conclusion he has reached in regard to the existence of man in glacial times on the Atlantic coast of North America."

Before this report was published these gravel deposits were visited by Prof. N. S. Shaler, who was fortunate enough to find a characteristic specimen, but not *in situ*. I also found one, likewise in the talus. Of these specimens, Professor Shaler says, "Although the whole face of the escarpment is in motion, creeping slowly under the influence of frost and gravity towards its base, it was difficult to believe that these specimens, found about twelve feet below the top of the bank, had travelled down from the superficial soil."

Continuing my own researches, in 1877, I made a second report

on the occurrence of these implements, and re-affirmed my conviction that in the specimens of artificially chipped pebbles, from these gravel deposits, we have evidence of man's presence at an earlier date than the supposed advent of the Indian; and referred them geologically to the glacial epoch, in accordance with the writings of Professor Cook, state geologist of New Jersey, who had pronounced these gravels as of glacial origin.

This, briefly, is the history of my own labors in this field; labors continued to the present time and with results that have invariably confirmed my impressions, as I have outlined them.

But admitting that a given class of stone implements is characteristic of a given deposit of gravel, and I think we must admit this now, what is the geological history of this deposit? Is it too recent to be of special import, or too ancient to be of archaeological significance? Both views have been held, and neither proves tenable. That the former view should have found supporters is indeed strange. Certainly there is now no movement of the gravel by the river, whatever its condition or freshet stage; and certainly, if these rude forms were of identical origin with common Indian relics, then rude and elaborate alike,—jasper, quartz, porphyry and slate together; axes, spears, pottery and ornaments, all of which are found upon the surface, should have gradually become commingled with the gravel, even to great depths. Any disturbance that would bury one, would inhumate alike the various forms of neolithic implements. Such, however, is not the case.

How old and not how recent are the Delaware valley, or, as they are now known, Trenton grave's? This, it is all-important, should be definitely determined. Until recently, there has been the widest range of opinion upon this point, and so great an antiquity claimed, that it was wholly incredible that man should then have lived. How true it is, as Prof. Morse has tersely remarked, "Man, profoundly interested in his origin and antiquity, finds himself hampered in his investigations by the opinions and prejudices that have grown up with him. He finds it well-nigh impossible to step outside of himself and regard himself as a mammal among hundreds of other species of mammals."

Depending upon others for my geology, under the circumstances mentioned, it can readily be understood why I was often so sadly bewildered. It was not only an instance of many men of many minds, but occasionally the same individual with numerous opin-

ions. Archaeological investigation, under such circumstances, was an up-hill task, the path to the truth being blocked by the obstacles that ignorance, prejudice and hasty conclusions heaped about it; but all the while, the gravel-beds themselves were inexorable and continued to yield evidences of man in spite of the interdictions of the baffled prophets.

A clear light was finally thrown upon these implement-bearing gravels, as the result of a careful study of them, from a geological standpoint, by Rev. G. Frederick Wright, who, as we have already seen, has determined the relationship of all such deposits, lying immediately south of the terminal moraine, to that greater deposit, and so given us approximately, their own age and connection with the last glacial epoch.

It is not necessary to give in detail, the conclusions reached by Mr. Wright. Suffice it to say, that he shows these gravels to be the last important result of the glacial epoch, the direct result of the melting of the glaciers, as they retired northward; and that while this was in progress, the rude implements of palæolithic man were lost and embedded in them.

Admitting this, how long ago did it take place? How great an antiquity does it imply? In this matter, Mr. Wright has been very generous, for which we are duly thankful, for the archaeologist has an almost insatiable appetite, never yet having had his fill of ages.

Concerning the antiquity of palæolithic man in North America, Mr. Wright has remarked as follows:

"A word may properly be said with reference to the bearing of these facts upon the date of man's appearance in America. In the first place, it should be observed that, to say man was here before the close of the glacial period only fixes a minimum point as to his antiquity. How long he may have been here previous to that time must be determined by other considerations. Secondly, with our present knowledge of glacial phenomena, the date of the close of the glacial period is regarded as much more modern than it was a few years ago. Sir Charles Lyell's estimate of 35,000 years as the age of the Niagara gorge, which is one of the best measures of post-glacial time which has yet been studied, is greatly reduced by what we now know of the rate at which erosion is proceeding at the falls. Ten thousand years is now regarded as a liberal allowance for the age of that gorge. But, finally, the term "close of the glacial period" is itself a very indefinite expression. The glacial period was

a long time in closing. The erosion of the Niagara gorge began at a time long subsequent to the deposit of the gravel at Trenton and at Madisonville. Between those two events time enough must have elapsed for the ice-front to have receded a hundred miles or more, or all the distance from New York to Albany; since only at that stage of retreat would the valley of the Mohawk have been freed from ice so as to allow the Niagara River to begin its work. The deposits at Trenton and Madisonville took place while the ice-sheet still lingered in the southern watershed of New York Pennsylvania and Ohio," and in a letter to me, bearing upon this question, he has kindly added, "you have got all the time you need, so far as I can now see." This is certainly encouraging! There was a time when, to all appearances, American archaeology would have to be squeezed into the cramped quarters of ten thousand years; but we are pretty sure of twenty or even thirty thousand now, in which to spread out in proper sequence and without confusion the long train of human activities that have transpired during prehistoric time.

Mr. McGee, at the last meeting of this Association, in giving the results of his studies of the Columbia formation, remarks as follows: "It has been inferred from the relation of the Columbia formation to the terminal moraine and the drift-sheet which it fringes, that the older deposit represents a period of quaternary cold, much earlier, much longer continued, and accompanied by much greater submergence, than the epoch of cold represented by the newer deposits; and it has been inferred from the relative erosion of water-ways since the two deposits—Columbia and latest glacial—were formed that the interval of mild climate and high level of the land between the two epochs of cold was from three to ten times as long as the postglacial period. These inferences are fully sustained by a long series of observations extending over three years of time and many thousand square miles of area."

If then, we accept the most moderate estimate of the length of postglacial time, some six thousand years, we have of interglacial time (*i. e.*, between the first and second epochs) from eighteen thousand to sixty thousand years, and to this, as I understand the matter, must be added, the long stretch of time during which the second epoch of cold continued. Assuming, therefore, that geologists have made no mistake, archaeology has time enough and to spare. At no time was the continent uninhabitable, however thick

and wide-reaching the ice, or deeply submerged the lower lying areas. Still there was land enough for mammalian life in all its glory, and it flourished at the very foot of the advancing ice-sheet, and reëntered every tract as the glaciers withdrew. Then we had the mastodon and mammoth, reindeer and bison, musk-ox and moose and Man familiar with them all.

In November, 1887, Mr. McGee presented to the Anthropological Society of Washington, a communication on "The Conditions of Accumulation of the Trenton Gravels." As it gives the clearest description of the geological conditions of the neighborhood, I propose to quote freely from an abstract of the paper kindly furnished me by the author.

Mr. McGee says: "There are, in the vicinity of Trenton, N. J., two distinct gravel deposits widely different in age. The first is a mass of current-bedded pebbles, cobbles, bowlders and coarse sand, generally graduating upward into a homogeneous loam or brick clay containing rare bowlders; the deposit rises to altitudes of perhaps two hundred and fifty feet in the latitude of Trenton, covers the surface generally as a mantle of variable thickness up to fifty or sixty feet and is sometimes fashioned into terraces—through one of the best examples of which the Delaware river has cut a moderately broad gorge in the upper part of the city of Trenton; the brick clays and gravel deposits along the Delaware river . . . the Columbia formation of the present author (McGee) . . . represent a sub-estuarine or submarine delta of the Delaware river, together with associated littoral deposits formed during the earlier epoch of cold of the Quaternary when the land in the latitude of Trenton was submerged two hundred and fifty feet or more.

The second gravel deposit is confined to an irregular area of the lowlands on both sides of the Delaware river above its great bend at Bordertown. It is composed of pebbles and cobbles (most of which are well rounded), together with scattered bowlders, embedded in a scant matrix of sand, loam and silt; the surface of the deposit is generally horizontal save where cut by recent drainage and its base is irregular; its maximum thickness reaching perhaps forty or fifty feet. It is evidently water-laid, though its bowlders appear to be ice-dropped, and it unquestionably is the southernmost extension of the overwash gravels from the terminal moraine formed during the later epoch of cold of the Quaternary when the

land was depressed as far southward as Philadelphia. It is to this deposit that the name "Trenton Gravels" has been applied, and its interest to anthropologists lies in the fact that palaeolithic implements are abundantly embedded within it.

The configuration and structure of the Trenton gravels alike indicate that they were deposited within and practically filled an estuary of the Delaware river contemporaneous with the later northern ice sheet and the hypsometric and geographic distribution of the deposit indicates the geographic conditions existing above the head of the Delaware Bay at that period. Restored in accordance with the testimony of the Trenton gravels the Delaware Bay of late quaternary time is transmuted from its present condition to a narrow tidal river, similar to the lower Hudson, extending from the terminal moraine to Trenton, and there expanding suddenly into a broad estuary analogous with that of the Susquehanna at its embouchure into Chesapeake Bay; indeed, the ancient Delaware Bay so closely resembled the present Chesapeake Bay that the latter conveys a definite conception of the former. The depression of the ice-burdened land extended southward barely to Philadelphia, and thus the tidal waters occupied a considerable area similar to the expanded head of Chesapeake Bay. Into this ancient Delaware Bay the great river, fed by the melting ice sheet, swept its detritus to be distributed by the waves and deposited in horizontal layers; and during the seasons of most rapid melting, ice floes formed nearer the margin of the glacier, bore the sand, pebbles and bowlders collected in the upper reaches of the river into this bay and there they floated in the currentless waters until they dropped their burdens, just as do the smaller ice floes in the Chesapeake Bay of to-day; while the finer detritus was mainly deposited in the upper reach of the river as is the case to-day in the Hudson. Meantime, the northern ice was a hundred miles away and did not prevent primitive man from assembling about the low and hospitable shores of the miniature sea which was probably the home of fish and fowl just as Chesapeake Bay is now the haunt of myriads of ducks and geese, and a famous fishing ground; and over the bosom of the bay, little affected by tide because of its distance from the ocean, and little disturbed by waves because of its shoalness, palaeolithic man may have floated on the simplest craft or even have waded in the shallow waters, as either primitive or civilized man might in the modern Chesapeake. These are the

conditions under which the Trenton gravels were accumulated and the presence of contemporary man is attested by the examples of his handiwork in all horizons of the deposit.

It is significant that all [nearly all—C. C. A.] the palaeolithic implements found in the Trenton gravels are of like material—*i. e.*, a variety of argillite—and that natural pebbles of this material are rare in the formation. It occurs *in situ* . . . not far from the Quaternary ice margin, and boulders of it are occasionally found in the deposit about Trenton, but its occurrence in the form of pebbles is so rare as to indicate that the implements must have been manufactured at a distance and carried by human agency to the ancient Delaware to be lost beneath its waters. It is significant, too, that the demonstrably artificial objects are least abundant toward the base of the deposit which was laid down before the geographic conditions above indicated were fully developed and that they increase in abundance upward culminating in the superior portion of the deposit formed when the geography of the ancient Delaware most closely approached that of the present Chesapeake; finally, it is significant that the distinctive palaeolith found within the Trenton gravel are also found on the adjacent surface made up of the older (Columbia) gravels associated with implements of more modern type, but that they are exceedingly rare over the surface of the Trenton gravels themselves upon which the more modern implements are common.

It should be noted that by study of the Trenton and Columbian gravels in conjunction with investigations of the terminal moraine and other glacial deposits farther northward, the Quaternary history of the region about Trenton has been elucidated. It has been ascertained that the Quaternary period of the geologists comprised two great epochs of cold . . . and it is noteworthy that all of the remains of palaeolithic man thus far authentically reported from the Quaternary deposits of eastern United States have come from deposits from the later ice action."

Why should we abstain from reconstructing a picture of the past from the fossils characteristic of a given geological horizon, simply because man must be included? To deny that any record is read aright because man figures in the past with extinct animals is the height of absurdity; and yet, overwhelming as is the evidence, intelligent people still claim a Scotch verdict of "not proven," must, at least, be given. I go, myself, still farther and claim that

the Delaware Indians witnessed in New Jersey the extinction of the mastodon; evidence to this effect tending to show not so much the very recent destruction of the mastodon in New Jersey, as that the Indian has a very respectable antiquity. With the disposition to modernize everything in connection with the Indian, as is now so popular, I have no patience. To claim that every artistic relic exhumed from the mounds is the handiwork of Europeans, or indicates an association with a superior race, is but a cheap and not creditable method of explaining away the beautiful objects that have been taken from many of these wonderful earthworks.

When my learned friend Dr. Brinton, in addressing this Association, a year ago, remarked, "To me the exceeding diversity of languages in America and the many dialects into which these have split, are cogent proofs of the vast antiquity of the race, an antiquity stretching back tens of thousands of years. Nothing less can explain these multitudinous forms of speech," — I could understand him, thinking as I did, of paleolithic man, and the then even more remote races of the Pacific coast; but when this same author, states as his opinion, "The uncertainty which rests over the age of the structures at Tiahuanaco is scarcely greater than that which still shrouds the origin of the mounds and earthworks of the Ohio and Upper Mississippi valleys. Yet I venture to say that the opinion is steadily gaining ground that these interesting memorials of vanished nations are not older than the mediæval period of European history. The condition of the arts which they reveal indicates a date that we must place among the more recent in American chronology. The simple fact that tobacco and maize were cultivated plants is evidence enough for this," — I am at a loss to discover any valid basis for such a conclusion.

If, as Brinton assumes, the mounds of Ohio were all erected during the past few centuries, what of the "tens of thousands of years" during which the language or languages of the mound-builders was in course of construction and subsequent subdivisions into "multitudinous forms of speech." Is it logical to suppose that, during the immense lapse of time demanded by Dr. Brinton for the formation of languages, these people did nothing, advanced nothing and became capable of building an earthwork only at the very close of an enormously long career? I cannot think it. That there are mounds in Ohio that date far back of any historic tribe of Indians, has, I believe, been fully demonstrated by the cautious and exhaustive explorations conducted by Professor Putnam and Dr. Metz.

Let us return to the consideration of early man in New Jersey and to his association with extinct mammals. That careful student of the subject, Rev. Samuel Lockwood, has given us a delightful account of the discovery of a mastodon in an old beaver meadow, and with his conclusions upon the subject, I will dismiss this phase of the question of early man. Says Dr. Lockwood: "Two facts have much impressed me—the great geological antiquity of the mastodons as a race, and the very recent existence of the individual we are discussing. The race began in Miocene time; this individual lived in the Quaternary age, and well up into the soil-making period. . . . Though the race came before those great castors now extinct, this individual was contemporary with the existing beaver, and doubtless with the aboriginal man. . . . It is plain that the mastodon came into what is now New Jersey ere the ice-sheet began. It receded south before it. It followed the thawing northward, and so again possessed the land. It occupied this part of the country when its shore-line was miles farther out to sea than it is to-day. Here it was confronted by the human savage, in whom it found more than its match; for, before this autochthonic Nimrod, Behemoth melted away."

Having made clear, I trust, what is meant by palæolithic man, and shown also, that he *was* a fact and *is* not a fancy, the question naturally arises, What was his fate? Did he, like the mastodon, become extinct, or has he descendants still living on this continent? There is opened here a wide field, but alas! with so few landmarks and these but ill defined, that the student is much in the position of the mariner when under clouded skies and without a compass.

There has been some speculation and a few bold assertions concerning the relationship of *Homo palæolithicus* to existing races, but I am not aware that any statement has been made, wherein the few facts in our possession are claimed to afford conclusive or presumptive evidence. Certainly so far as my own experience goes, the inference I drew from the character of the stone implements does not accord with the crania found in the Trenton gravel. These are not crania of Eskimos, and I had long inclined to the supposition that to these people might be referred the ruder forms of stone weapons, such as we have seen are found in the gravels of the river valley. On the other hand, the three skulls referred to are unques-

tionably different from those of the known tribes of Indians of the Delaware valley.

Rev. B. F. De Costa has, under the title of "The Glacial Man in America" published a very thoughtful paper in which he endeavors to show, from historical data, the plausibility of the view that the Eskimo now represents this most ancient of America's races.

This author states that "whatever may be concluded ultimately respecting the antiquity of the Delaware flints, it is quite apparent that the red-man found in America at the period of its rediscovery by Cabot, Vespucci, and Columbus, was not the descendant of any glacial man. No line of connection can be made out. This continent does not appear to have any Kent's Hole like that at Torbay, affording a continuous history, beginning with the cave-bear and ending with 'W. Hodges, of Ireland, 1688,'" and again, "however man may have reached America, the theory that the Indian peoples sprang from any glacial stock seems untenable. This then, necessitates the inquiry respecting the subsequent history of the primitive inhabitant; otherwise, what became of him?"

That a people corresponding in the main to the supposed glacial man once dwelt as far south as New Jersey has been agreed by various writers, without any reference to the contents of the glacial deposits, of whose existence they did not dream. When, for instance we turn to the Icelandic Sagas relating to America, it becomes apparent that the Esquimaux once flourished low down upon the Atlantic coast." And yet again, quoting from the same essay, we find the statement, "The so-called aboriginal red-man is comparatively a modern, although the author of 'Leaves of Grass' asks concerning 'the friendly and flowing savage,' is he 'waiting for civilization, or past it and mastering it?' However this may be, he is wandering over the graves of peoples who left no record of their exploits, either in the continent where they sprang into life or where they died. . . . In New England he must have succeeded the people known as Skrellings. Prior to that time, his hunting-grounds lay toward the interior of the continent. In course of time, however, he came into collision with the ruder people on the Atlantic coast, the descendants of an almost amphibious glacial man. Then the coast-dweller, unable to maintain his position, retreated toward the far north. The northward movement, however,

may have been voluntary in part. During long ages passed in the companionship of the glacier, the race must have acquired that taste and fitness for boreal life which clings to the native of the north to-day, and which makes the Greenlander feel that his country is the most beautiful in the world."

Let us see now to what extent these statements of Mr. De Costa are borne out by the traces of early man in New Jersey. Do they or do they not lend probability to them? I have given you the evidence, so far as gathered of strictly paleolithic man, living in the valley of the Delaware during the last epoch of cold. It consists mainly of the rudest known forms of large stone implements, made of argillite of flinty hardness and breaking with a conchoidal fracture. Its peculiarities as a mineral have already been stated, based upon its examination by Mr. Wadsworth. Now it happens that just as the occurrence of surface quartz veins, near Little Falls in Minnesota, proved the first available locality for that rock, so desirable for making implements, as the ice-sheet withdrew; so, in the Delaware valley, a few miles north of Trenton, argillite occurs in place and likewise offered the first available mineral for effective implements other than pebbles, and these were largely covered with water and not so readily obtained, as at present; while the dry land of that day, the Columbia gravel, contained almost exclusively, in this region, small quartzite pebbles an inch or two in length.

If the paleolithic implements were strictly confined to the gravel deposits, like fossils in the underlying marl-beds, then, as it seems to me, the Eskimo theory would fall, and we could only conclude with Dawkins that "we cannot refer them (*i. e.*, the paleolithic folk) to any branch of the human race now alive;" but, as a matter of fact, there is no such break — no evidence of an hiatus of greater or less duration between paleolithic man and the Indian. The former continued to dwell here until the last pebble of the great gravel deposit had been laid down, and possibly into the soil-making period, but not now, as paleolithic man. Whether the change wrought by the alteration of climate, and its influence on the fauna and flora, had to do with it, or through other influences it was effected, none can tell, but the significant advance to the manufacture of more specialized implements took place; the rude argillite paleolith, the same in form the world over, giving way to spears and other definite forms. The form of the product altered, but the same material, argillite, continued in use. There was no pot-

tery, no polished stone, little if any attempt at ornamentation; still, when we compare these later objects of argillite with the earlier and original patterns, we see what a tremendous forward stride had been made. Had it aught to do with the acquirement of power of speech? as argued by Mr. Hale, that the "speaking man" is a descendant of the "speechless man" of the River drift. But great as the change is, it is insignificant when compared with the handiwork of the Indian — of his handiwork prior to any European contact.

On what grounds can this dissociation be based? Does mere rudeness in the fashioning indicate a difference of origin? Why may not the spearpoints of argillite be the work of Indians as well as similar objects made of jasper? These are questions invariably asked, and however satisfactory the replies have been to myself, they have not proved so, in all cases, to others.

The fact that these rude spearpoints occur upon the surface of the ground is with many an insuperable objection to any claim to significant antiquity; these objectors forgetting the while that there has been habitable surface soil in this region — New Jersey — for a much longer period, than man's first appearance on earth; even in the Garden of Eden.

Let us consider the two questions to which I have referred.

Does mere rudeness in the fashioning indicate a difference of origin? Of itself, certainly not. There are Indians who still make, or did very recently, implements far ruder than the least finished palæolith; and implements of essentially palæolithic character occur wherever ordinary Indian relics are found, but this neither implies that the Indian was a palæolithic man, or that the oldest of these objects, found in gravel deposits was the handiwork of Indians. So long as this confusion exists, so long will American archaeology be an unsolvable problem. The telling fact with reference to these argillite spearpoints is that they are not, in the same sense as jasper arrowheads, surface-found implements. They occur also, and even more abundantly beneath the surface-soil.

The celebrated Swedish naturalist, Peter Kalm, travelled throughout central and southern New Jersey in 1748-'50, and in his description of the country remarks: "We find great woods here, but, when the trees in them have stood a hundred and fifty or a hundred and eighty years, they are either rotting within, or losing their crown, or their wood becomes quite soft, or their roots are no

longer able to draw in sufficient nourishment, or they die from some other cause. Therefore when storms blow, which sometimes happens here, the trees are broken off either just above the roots or in the middle or at the summit. Several trees are likewise torn out with their roots by the power of the winds. . . . In this manner the old trees die away continually, and are succeeded by a younger generation. Those which are thrown down lie on the ground and putrefy, sooner or later, and by that means increase *the black soil*, into which the leaves are likewise finally changed, which drop abundantly in autumn, are blown about by the winds for some time, but are heaped up and lie on both sides of the trees which are fallen down. It requires several years before a tree is entirely reduced to dust."

This quotation has a direct bearing on that which follows. It is clear that the surface-soil was forming during the occupancy of the country by the Indians. The entire area of the state was covered with a dense forest, which, century after century, was increasing the *black soil* to which Kalm refers. If, now, an opportunity offers to examine a section of virgin soil and underlying strata, as occasionally happens on the bluffs facing the river, the limit in depth of this black soil may be approximately determined.

An average, derived from several such sections, leads me to infer that the depth is not much over one foot, and the proportion of vegetable matter increases as the surface is approached. Of this depth of superficial soil probably not over one-half has been derived from decomposition of vegetable growths. While no positive data are determinable in this matter, beyond the naked fact that rotting trees increase the bulk of top-soil, one archaeological fact that we do derive, is that the *flint implements* known as Indian relics belong to this superficial or "black soil," as Kalm terms it. Abundantly are they found on the surface; more sparingly are they found near the surface; more sparingly still the deeper we go; while at the base of this deposit of soil, the *argillite* implements occur in greatest abundance.

Here, then, we have the whole matter in a nut-shell. The two forms were dissociated until by the deforesting of the country and subsequent cultivation of the soil, except in a few instances, they became commingled.

Perhaps the most important discovery bearing upon the question of the descendants of palaeolithic man is that of Mr. Hilborn T. Cresson who has found, in the alluvial deposits at Naaman's Creek,

in Delaware, traces of pile-structures, upon which we may presume that a rude fishing people had erected their houses. A detailed description of these remains and the objects found will be given in due time in the publications of the Peabody Museum, but I may lay stress upon the character of the stone implements dredged from the mud about the piling. At two of the structures or "stations," Mr. Cresson finds only argillite implements, many as rude as some of paleolithic types, and a large number of those long, slender spearpoints to which I have already referred. In a third "station," there is a mixture of these forms with others of quartz, jasper and other silicious mineral, with traces of rude pottery.

These discoveries certainly bear out the suggestion I advanced years ago of an intermediate period of human occupancy of our Atlantic seaboard. Here, on the Delaware river, as Lockwood found in the shellheaps of Keyport, New Jersey, and the surrounding country, occur both jasper and argillite, but not so associated as to demonstrate that both minerals were in use at the same time, or used by the same people at different times. On the contrary, the conclusion reached by every competent investigator has been that implements made of argillite antedate those of jasper; and this single impression of many unbiassed students goes a long way toward proving the essentially correct character of these impressions.

Negative evidence of the soundness of this view is had in the character of the sites of arrowmakers' open-air workshops, or those spots whereon the professional chipper of flint pursued his calling.

In the locality where I have pursued my studies several such sites have been discovered and carefully examined. In no one of these workshop sites has there been found any trace of argillite mingled with the flint-chips that form the characteristic feature of such spots. On the other hand, no similar sites have been discovered, to my knowledge, where argillite was used exclusively. The absence of this mineral cannot be explained on the ground that it was difficult to procure, for such is not the case. It constitutes, in fact, a considerable percentage of the pebbles and boulders of the drift, from which the Indians gathered their jasper and quartz pebbles for working into implements and weapons.

If the absence of argillite from such heaps of selected stones is explained by the assertion that the Indians had recognized the superiority of jasper, then the belief that argillite was used prior to

jasper receives tacit assent. If, however, it was the earlier *Indians* who used argillite, and gradually discarded it for the various forms of flint, then we ought to find workshop sites older than the time of *flint* chipping, and others where the two minerals are associated. This, as has been stated, has not been done. Negative evidence this, it is admitted, but when considered in addition to the positive evidence of position in undisturbed soil, it has a value that must not be overlooked. Sufficient positive evidence to clear away *all doubt* in the minds of many, of the presence of an earlier people than the Indian on the Atlantic seaboard of America will probably never be forthcoming; yet, to the minds of candid inquirers, there is a degree of probability in the interpretation of known facts that closely hugs the bounds of certainty.

This briefly covers the range of evidence, first, that palaeolithic man did not become extinct; secondly, that his descendants attained to an advanced degree of culture in the land of their forefathers. What then was this people's subsequent career? Were it not for the three skulls, to which reference has been made, we could still maintain that we have their descendants in the Eskimo, and that they were finally driven north, after contact with the Indians, who, as is conceded by all students, migrated hither, at, archeologically considered, a not exceedingly remote period. The Indian traditions assert that they found the region occupied; and for once, at least, we have evidence which confirms tradition.

However others may be impressed by what I have now presented, for myself, as I wander along the pleasant shores of the Delaware river, seeing it but a meagre stream between high banks, in mid-summer; or, in winter, swollen and choked with ice, until these are almost hidden, I recall what time this same stream was the mighty channel of glacial floods pouring seaward from the mountains beyond and picture the primitive hunter of that ancient time, armed with but a sharpened stone, in quest of unwary game. And later, when the floods had abated and the waters filled but the channel of to-day, I recall that more skilful folk who with spear and knife captured whatsoever creature their needs demanded,—the earlier and later Chippers of Argillite.

These pass; and the Indian with his jasper, quartz, copper and polished stone looms up, as the others fade away. His history, reaching forward almost to the present, I leave in the hands of others to record.

