

rock, and are now the abode of thousands of bats, which fly about in great numbers when disturbed by the sight-seeker.

A few miles above Montezuma's castle, on the opposite bank of the creek, a conspicuous cone-like mountain rises a few hundred feet above the surrounding country. On making the ascent, the summit was found to be a narrow rim enclosing a crater some three hundred feet in diameter and with nearly perpendicular walls. Standing on the rim, one can look down a hundred feet upon the dark-blue water of a small lake in the bosom of the mountain. The lake, a hundred yards in diameter and of unknown depth, is known as Montezuma's well. In the steep sides of the crater are a number of caves, which at one time were the abode of man. A few are natural, but the greater number are the result of human effort.

The rim is crowned with the fallen walls of an ancient ruin more than a hundred feet long. Far down the mountain-side, below the level of the water in the crater, the outlet of the well flows from between an opening in the rocks. This stream is large and constant, and at present is used to irrigate a ranch in the valley below. Ages ago the builders of caves and castles utilized this same stream to irrigate portions of the neighboring rich valley.

A short distance down the valley a stone and cement ditch of pre-historic make can be easily traced for many rods. Ranchmen in building ditches frequently follow the courses of ancient ones. In July, last year, in constructing an irrigating ditch near old

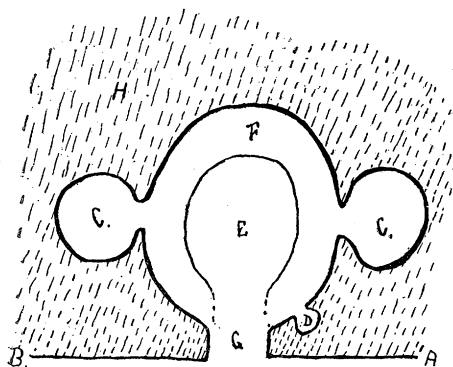


Diagram showing floor-plan of cave. The line *AB* represents face of cliff; *C*, lateral caves; *E*, main cave; *F*, rock bench surrounding main cave; *G*, entrance; *D*, small cavity hollowed in rock near entrance; *H*, rock of cliff.

Fort Verde, on the west side of the river, the workmen found evidences of an ancient ditch buried some twelve feet below the surface. Many of the old ditches have been found upon mesas where under present conditions it would be impossible to get water to fill them. Frequently they lead from what are now dry washes which only carry water a few days at a time and then only after heavy rains. This seems to indicate that there was a time when the now dry washes carried water much more constantly than at present.

More numerous than the casa and cliff ruins are the many caves excavated from the sand and limestone cliffs along the east bank of Verde River for some miles below the old fort. At a distance the openings into the caves look like black spots on the white cliffs. They are arranged in long rows, tier above tier, and are nearly alike in structure. All are more or less inaccessible from the valley below. The entrance is an irregular arched opening about four feet high and from half to two-thirds as wide. The cave proper is about twelve feet in diameter and from four to six feet to ceiling. The room is more or less circular in outline. A rock bench from twelve to eighteen inches high occupies the cave on all sides except at the entrance. This bench is about three feet wide, and gently slopes toward the centre of the room. Charred embers, meates, grinders, broken pottery, and fragments of reed mats were scattered about or were under the heaps of *débris* which covered the floor. Opening into the main cave at either side and also frequently at the rear were smaller ones, which were three to five feet in diameter and about the same to ceiling. In nearly all the caves visited the floors of the smaller ones were

from one and one-half to two and one-half feet below the floor of the main room.

It is probable that the small caves were used for the storage of grains and other material. No light finds its way into the small lateral and rear caves but the little that comes in through the small openings leading to the central room. In two or three instances I found two large caves joined by a small passage-way uniting the lateral caves. Occasionally, hollowed from the wall, at one or both sides of the main entrance, some two feet above the floor, were small pocket-like cavities about twelve inches in diameter and nearly spherical in outline. The openings to them were four or five inches across, so large that one could easily reach with the hand any object that might be placed therein. Not only the floors of the caves, but in many instances the entire face of the cliffs, were covered with broken pottery, some of it of much better quality than that made by the Indians of Arizona to-day.

So far as I have had opportunity of examining, the caves of this region are much different from those in the cliffs along the Colorado River and elsewhere in the territory. Here it is evident they have been hollowed out by human effort. In other localities natural caves and large horizontal fissures in the cliffs were the homes of this early people.

PALÆOLITHIC MAN IN NORTH AMERICA.

BY DR. C. C. ABBOTT.

THE ghost of palæolithic man has arisen to plague the geologists at Washington; and those that look upon them as little gods are all shouting "Me, too." As the cause of all this mischief, it is fitting that I should speak in my own defence. The scientific men of Washington claim a monopoly of knowledge and so occupy a peculiar position, self-assumed, of course. That which is offered the world independently of them, must be stamped by their approval or condemned, and it is never the former. This condition of affairs really handicaps them at the outset, and not one can enter the field unbiassed. Indeed, they go out instructed to bring in such and such results, and none other. This is pre-eminently so in the question of the antiquity of man in North America. The recent appearance of Wright's book, "Man and the Glacial Period," has set their pens and tongues wagging, but palæolithic man is not to be downed even by such an array of notables marshalled to defeat him. Salisbury's cunning argumentation, McGee's shaggy front, Holmes's imperious "begone!" and Brinton's persuasive smile do not make him afraid. He returned to earth in his own good time and came to stay!

Of the alleged evidences brought forward by others I have nothing to say, but something to record concerning my own investigations, that may have a bearing on the question. We must admit that, at some given day in the past, man appeared on this continent; but just when, no one has ventured to assert. Certainly in no one communication to scientific or popular literature have I done more than claim the discovery of evidence of his comparatively primitive condition when he did arrive; and now after twenty years of careful, unremitted study of the valley of the Delaware River, I see no reason to change my opinion, but a great deal to substantiate it.

Were the evidences of man's occupancy of this region one associated and confused mass, an attempt made to dissociate its components into rude and more elaborate forms and to say of the former, *this is old*, and of the latter, *not so ancient*, then the scientific world might well be up in arms and cry down the apparent absurdity — but this is not the case.

Of course, if we claim, as, for instance, Mr. Holmes practically does, in spite of denial, that every so-called palæolithic implement is a "reject," whether the man who threw it aside lived in Europe or America, the whole subject falls to the ground; but accepting palæolithic man as a one-time feature of other continents, and believing no geological reasons have been brought forward why he might not have lived in North America also, it is justifiable to consider the archæological significance of such objects as the late Wyman said were not distinguishable from European forms, except by the material of which they were made.

Now, as a matter of fact, a considerable number of just such forms have been found in the gravel deposits at Trenton, N.J., and at a significant depth; but, says the geologist, what of the age of this deposit? The whole question hinges on this. Professor Salisbury asserts that since the deposit was originally laid down, it has been reassorted. Grant this, and what then? If the reassortment took place in "Indian" times, how does it happen that only this one form and simple flakes are found entombed? Holmes here steps in and says "easy enough," the Indian went to the river-shore, chipped pebbles, and retired to the back country, leaving his "rejects." But are we to suppose the Indian never went to the water's edge for any other purpose? Did he not take his finished implements to the river to fish and hunt? Did he not cross the river by a raft, canoe, or by swimming? Did he necessarily always live back from the stream? Common sense points out that he must have had the whole range of his goods and chattels continually at and on the water, and are we to suppose that never a knife, arrow-point, bead, or pot was lost? It is too absurd to consider; and this reassortment of the gravel-beds must have buried a great deal more than "rejects." Again, it has been asserted that the assumed palæolithic implements are only in "talus." Carvill Lewis, according to Brinton, says what I held to be undisturbed layers, were really an "ancient talus." Possibly, but how ancient? In at least a dozen instances this asserted "old talus" was caused by floods having a transporting power equal to piling up layers alternately of sand and gravel, and then, as if to anticipate the present tempest in a tea-pot, placed a boulder, weighing tons, over it all, for fear that the poor palæolith might run away. Now, when grooved axes and polished celts are found under like conditions, I am willing to leave the field as fast as my short legs will permit, and not before.

Professor Salisbury has asserted that there is need of expert testimony to determine the precise age of the implement-bearing gravels, and Dr. Brinton insists that no opinion as to the geological age of a gravel can be received from any but an expert geologist. Grant it; but the trouble is these "expert geologists" are *rare aves* that were never yet known to agree among themselves, and it becomes a mere matter of personal opinion after all. I lay claim to a smattering of gravel-ology. I have lived on pebbles so long that I have become flinty-hearted so far as criticism is concerned, and when I find gravel stratified and unstratified, I know and assert the difference; and when a palæolithic implement is found in gravel beneath layers of sand and pebbles, beneath huge boulders (not merely at a lower horizon, but directly beneath them), I do not, and no reasonable person should want another to tell him that the two were laid down together, or the big boulder was dropped upon the implement, which anticipated its coming. Up pops some "authority" and declaims the possibility that the ground was washed from beneath the big stone and the implement slipped in. Well, we can go on supposing till the crack o'doom, but as to proof, that is another matter. These geological jugglers will prove yet that the Indians bought the Delaware Valley from William Penn.

Certainly too much value is put on this matter of expert testimony. Then, again, in spite of all that has been written and said, the assertion is made that palæolithic implements are found only at the present river-shore. Of course we find them there now, because the gravel is exposed, but not there alone. A full mile back from the river they have been found in digging cellars, sinking wells, and in the cut of the Pennsylvania Railroad, east of Trenton, N.J. All this area may have been "reassorted," but in such delicate fashion that the strata are not broken, and it suggests that the manner of it was like turning over a book from one cover to the other.

Again, it has been objected that no animal remains have been found; but Cook found a mastodon, and I have, more significant yet, a valve of a *Unio*; and what of human remains, long since reported? There are, too, at the Peabody Museum, three human crania, two of which were taken from the gravel and one found in the bed of a creek, and these three, identical in character, stand alone in a collection of nearly three thousand Indian crania.

It is the weak point of Wright's book that he did not prepare the archæological portion at the Peabody Museum, with my col-

lection under his eyes. If he had, the critics would not have had a leg to stand upon.

The implements, too, speak for themselves. If "rejects" as Holmes dogmatically asserts, why is it that they were carried to the high ground, and are found to-day, solitary and alone, silent witnesses of that long ago, when it was the principal weapon of the early man who used them? And if "rejects," made at the water's edge, where are the chips resulting from their fashioning? They are not scattered broadside over the river-shore as are the implements; but we do find in spots where "rejects" were made in numbers, and know the fact because of the accumulated chips. It is easy to conceive a theory and bend the facts to it; very, very easy; but the trick is found out, sooner or later.

"But they show no sign of use" pipes some impatient kicker. Prove it; and does the spear or arrow-point show signs of use? Of over a thousand chipped jasper scrapers in the Abbott collection at the Peabody Museum, not a half-dozen show sign of use, and the same may be said of drills.

These rude implements are made of argillite, and the use of this material was continued down to the time of European contact, being less and less used after the discovery of jasper. The magnificent results of Mr. Ernst Volk's explorations, under the direction of Putnam, in the valley of the Delaware, clearly prove this, and so substantiate what I have claimed for all these years; and is it not significant that some of the most finished specimens of palæolithic implements have been found *in situ*? By what authority do the critics say they are too rude to be effective? Is any person living so in touch with primitive man to-day as to assert what he could and could not have used? It is well to bear in mind that many an undoubted Indian implement, just as rude, was used by these later people. Look at the rude spades and slightly chipped but girdled pebbles that were used as club-heads.

Of course in the days of palæolithic implement-making there would be "rejects," and the critic must not attempt to prove too much, because such are found, even in undisturbed gravel. Many a pebble, too, has been chipped until suggestive of an implement, by the detaching of flakes to be used as knives, as Mercer pointed out at the Rochester meeting of the A. A. A. S., and a splinter of stone was not too elaborate an implement for supposed palæolithic man to have used.

And now, in conclusion, let us remember that the native American — the Indian — is a type distinct from all other peoples; let us not forget that their languages are all a purely home product, and that these facts show undeniably a necessarily long occupancy of this continent, shut out for centuries from all the world. If he, *as a fully equipped Indian*, came from another region beyond the seas, his similarity to the people of that region could be traced. As it is, he came, so far as our knowledge now extends, when man over the whole world was not racially developed as now, and so, when in a comparatively primitive condition; such a condition as is suggested by the simplest of implements, whether for the chase or domestic uses. Here, in North America, this early man became a potter, invented the bow, and gradually reached that status of culture, differing in degree in different parts of the country, in which he was found by European explorers.

As a student of archæology, I submit that this occupancy of the continent commenced when there was a changing condition of the river valleys in progress; but whether that change was subsequent to the glacial epoch or during it, deponent saith not. That it was during a time when rock-transporting floods were common, I do claim. That it was when ruder than ordinary Indian implements were the common tools of the people, I do claim, for how else could only such rude forms be associated as they have been shown to be with gravels that show no evidence of disturbance except such as forces not now in operation, effected? It is true, palæolithic and Indian objects are now associated, but they are also separate and apart. What I contend for is the sequence of events of the original use of a rude weapon or tool, the one implement of that day that was manufactured, and, as time rolled on, the production of more elaborate forms, and all that pertains, the world over, to the accepted neolithic stage of human advancement.