

SCIENCE

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ARCHÆOLOGY 1880-1892.

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Egypt—Mr. W. M. Flinders-Petrie.

IN the last few years practical archæology has made rapid strides; and — thanks to the increasing number of well-qualified scholars who to-day fill its ranks, as well as to the consequent precision of its improved methods — it not only may now be numbered among the natural sciences, but a general knowledge of its results has become a necessary part of the intellectual outfit of every man who would lay a claim to keeping abreast of the times.

Scarcely a year passes without bringing some new and startling discovery that sheds a vivid flash of light upon some hitherto obscure corner of the remote past. Ancient Egypt, Mesopotamia, Syria, the Mediterranean islands, Asia Minor, the palæolithic and neolithic human strata of pre-historic Europe — all of which, fifty years ago, appeared to the student as isolated reefs, here and there cropping up out of the dark surrounding abyss of time, apparently unconnected with one another, and having but little if any bearing upon our own civilization — are now assuming a new interest. Each is gradually taking its proper place in the great scheme of history; and, in so doing, many of the human fossils, whose dismembered forms, viewed singly, seemed abnormal and fantastic, are resuming their natural aspect. The so-called giants of the past, examined in the light of modern criticism, are shrinking to a normal size; the mythical races have lost their fabulous character; the wild savage has given place in scientific literature to the non-civilized man; the barbarian to the man of low culture; and all have become well-connected links in the long chain of classified human development.

Civilization, in the earliest times as at the present day, has been found to be a sliding scale; and we now know that, in the fourth millennium B.C., as in the nineteenth century A.D., there might be found upon the surface of the globe every grade of culture from the highest, which found expression in the inscribed monuments of Egypt and Chaldea, to that whose remains might be sought among the shell heaps of the far-north.

The pre-Homeric Greeks and the other inhabitants of pre-historic Europe and northern Africa are no longer ignored as little better than savages. As they take their proper place in the history of humanity, Egypt ceases to be spoken of as a "Miracle in Stone;" and — if it still stands pre-eminent among the nations of the ancient world — for the modern scholar it now only represents the crest of the irresistible onward wave that, at a given time, carried human thought to the point where the advancing genius of the Mediterranean races took it up and idealized it, before receding in its turn and leaving its future progress to the peoples of the north.

The recent researches of anthropologists, interpreting the facts furnished by the pre-historic burials of Europe, have everywhere strengthened the view which connects its former inhabitants with the populations of the historical period. Types that once seemed widely different are found to be connected by intermediate ones; and a continuous line, reaching back through ages, has in many instances been formed by the recovery of missing or of hitherto misinterpreted evidence.

As the question now stands, those who would still cling to the hypothesis of Indo-Germanic migrations pouring down into Europe from the plateau of central Asia, must be prepared to face an immense body of facts which they will find equally difficult to get over or to disregard. The theory of the Asiatic "cradle of

the Aryans" was originally accepted upon the authority of such eminent philologists as Pott, Lassen, and others; and, despite the early protests of a few scholars (see Dr. D. G. Brinton in *Science*, June 24, 1892), its hypothetical nature was lost sight of and it soon found its way as an undisputed fact into our hand-books and primers. Even to-day — although the word "Aryan," divested of its former meaning, has mainly become a term of philological classification for those who are familiar with the subject, and notwithstanding the arguments to which the use or the misuse of the word has publicly given rise — this curious myth of the nineteenth century still holds the position of an orthodox belief, and is still taught as an article of faith in our schools!

In the face of such facts, and as the results of archæology have a recognized and direct bearing upon many branches of scholarship, it is of serious moment that these results should be published, not only as speedily as possible, but in such a form as to make them available to all.

At present this is rarely the case. As a rule, the labors of archæologists working in different fields are published either in large works, the technical details of which are well calculated to frighten all but specialists, or in some one of the many scientific journals edited in all parts of the world. The number of these, however, is increasing yearly; and this fact considerably diminishes the chance of each to reach all those interested, again excepting the specialist, who of course makes it a point to see all that is written in reference to his own line of research.

Owing to this, much that is of vital consequence to the intellectual world at large is passed by or often remains long unnoticed by an important portion of the community.

It is therefore greatly to be desired that archæologists, who wish their labors to be of as much use as possible, should follow the example given them by Mr. W. M. Flinders-Petrie. This indefatigable scholar — with whom to drop the spade is but to take up the pen — has found the time, in the midst of his more serious scientific work, to publish a *résumé* of his recent explorations, under the title of "Ten Years' Digging in Egypt."

This little book will not only be useful to students, but must prove delightful reading to all who are interested in the progress of scientific discovery. Moreover, although condensed, as it necessarily must be in order to carry out the intention of the author, it is extremely suggestive, and opens to the mind possibilities most stimulating to every thoughtful student of the past.

In ten chapters the explorer lays before his readers the well-sifted residuum of new facts acquired to science through his excavations at Gizeh, Tanis, Naukratis, Daphnæ, Nebesheh, Hawara, Illahun, Kahun, Gurob, and Medûm, dwelling only upon such "finds" as distinctly bear upon the life, the history, the arts, and industries of man in the valley of the Nile, at the various periods represented by those sites.

It would be difficult to discriminate with regard to the relative value of these discoveries, each of which has elucidated some obscure point of science. Much light has been thrown upon the geology and the formation of the Nile valley as well as upon the climatic and topographical changes that have taken place since pre-historic times.

Valuable information has also been gained with regard to the tools and the devices employed by the Egyptians in the carrying-out of their artistic and architectural works, and upon the technical details of their earliest monuments.

The careful examination of the pyramid of Medûm — the tomb of King Seneferu (third dynasty), has established the evolution of the pyramid from the mastaba; and the discovery of its temple has placed before us, intact, the oldest-dated edifice in the world.

Moreover, the close observation of the well-executed hieroglyphs found upon the walls of the tombs of this ancient nekropolis has given many useful hints as to early Egyptian customs. For instance, the fact that the numerals turn out to be formed of lengths of rope, has suggested to Mr. Petrie the possibility of an original reckoning by means of ropes — a custom found in other parts of the world.

At this remote period stone and copper tools were used; only one bronze implement having been found in the course of the excavations. This exceptional piece Mr. Petrie regards as a trade importation; if, indeed, as is more likely, its presence is not to be accounted for by displacement from a higher level—it would be difficult to imagine whence true bronze could be imported in the fourth millennium B. C.

Under the reign of Seneferu, the Libyan already appears as the civilized ally of Egypt; as is testified by the familiar hieroglyph of the Libyan soldier armed with his bow and arrow.

Traces of two distinct races — represented by distinct funeral customs — were also found among the graves near this pyramid. From these were obtained fifteen skeletons, five of which present cases of mutilation or deformity. The series is now at the College of Surgeons, where it will be studied and reported upon.

The other chapters of Mr. Petrie's book, in which he treats of his excavations in the Delta and in the Fayûm, are no less interesting. They furnish the reader with the principal data upon which the learned explorer bases his conclusions as to the relation of Egypt to the rest of the ancient world; and they naturally lead up to the eleventh chapter, in which these conclusions are expressed and vigorously set forth.

It was already fully established, by inscriptions found upon the Egyptian monuments, that the Mediterranean races were in contact with Egypt under the New Empire. Mr. Petrie has not only added to the evidence: he has recovered traces of foreign colonists residing in the Nile Valley, and has brought forward proof that close intercourse existed at least as early as the fifteenth century B.C., with a strong presumption in favor of the view that such intercourse must be carried back to a much earlier period.

From the facts which have come to light in Egypt and elsewhere, he argues that the civilization of the Bronze Age arose in Europe; that the use of bronze was introduced into Egypt by northern, not eastern, contact; and that it is from the mines of Hungary, Saxony, and Bohemia that the tool-makers of Pharaonic times derived the tin which they used as alloy in their industry.

According to Mr. Petrie, Europe evolved its own culture as independently as Egypt itself, and in its relations with other civilizations it gave the East as much as it received. It is indeed to Europe that we must look for the origin of the bronze age; and there is little doubt that, if the place occupied by the primitive culture of Europe has so long been overlooked and ignored, it is principally because it did not evolve a graphic system, and therefore remains silent when the monuments left by the Oriental civilizations are bursting into words. Yet, "if silent, it is not dumb." The Mykenæ culture has left traces that lead us back at least to the sixteenth century B.C. (its decadence had already begun by 1100 B.C.). It was not confined to Greece; it was far-reaching, and represents the highest outcome of the bronze age. Its influence was felt from the Mediterranean to the Baltic, and it came into contact with Asia as well as with Africa.

"This bronze age," says Mr. Petrie, "is the source of the objects we now use. Thence these types were carried into Egypt a couple of centuries later by the Greeks. When we descend further, we see this independent culture of Europe prominent. The Saxons and the Northmen did not borrow their weapons, their laws, or their thoughts from Greece or Italy. The Celts swamped the south of Europe at their pleasure; and against the fullest development of Greek military science they were yet able to penetrate far south and plunder Delphi. They were powerful enough to raid Italy right across the Etrurian territory. When we look further east, we see the Dacians with weapons and ornaments and dresses which belong to their own civilization, and were not borrowed from Greece. In short, Greece and Italy did not civilize Europe, they only headed the civilization for a brief period."

Such are the conclusions reached by Mr. Petrie after ten years of patient investigation and of a most serious study of the Egyptian written and unwritten record. In matters of detail Mr. Petrie's interpretation of certain facts may be open to discussion; some time will probably elapse before the exact dates suggested by him for some of his "finds" are definitely adjusted to the entire satisfaction of experts in special branches of culture; but, in their bearing upon the history of civilization, his views may broadly be said to fit in with the general results of archæologists elsewhere.

Before the time of Dr. Schliemann's explorations, the Mykenæ culture had yielded so little, and its extent and influence were so ill understood, that the strong individuality displayed in its art was, if not unnoticed, at least unappreciated. With a better understanding of its remains, this art, wherever met with, reveals an originality of methods and of technic which cannot be denied, and its archaism has become evident.

It not only produced tombs, the grandeur of which outshone the dwellings of the living; and massive stone palaces, the walls of which were decorated with painted frescoes, — the work of a school whose artists borrowed neither their subjects nor their mode of treatment from others, — but metallurgy had reached a high degree of development; bronze, silver, and gold were wrought with the greatest skill; the engraver displayed a true artistic sense in the cutting of gems; and the manufacture of fine painted vases did credit to the originality of the Mediterranean potters. Altogether we are here in the presence of men who, in the course of their evolution, may have received suggestions from the outside world, but who never were servile imitators; and who, in their relations with other civilizations, "gave as much as they received."

Cyprus.—Dr. Max Ohnefalsch-Richter.

In Cyprus, the well-known explorer, Dr. Ohnefalsch-Richter, has detected — below other ancient human deposits found upon the island — the presence of a Phrygo-Thracian civilization which belongs to the copper-bronze age.

This he regards as having certainly preceded all contact with Mesopotamia, Egypt, or Phœnicia; and as presenting many affinities with the kindred culture of which the late Dr. Schliemann found the traces in the lower strata reached in his excavations at Hissarlik — the site of ancient Troy. Dr. Richter's view is accepted by other authorities, notably by Dr. Dümmler, who goes even further, and regards both cultures as identical.

It is only later, under Sargon I. of Akkad, and Naram-Sin, his successor, that Mesopotamian influence can be detected upon the archæological record of Cyprus; and it is later still that direct contact with Egypt and with the Hittite Empire makes itself felt.

According to the facts brought to light by Dr. Richter, Greek influence antedates the oldest traces of Phœnician intercourse with the island; and the Greco-Cyprian syllabic character occurs in process of formation in the copper-bronze stratum, i.e., an earlier date than the first evidences of the use of the Phœnician character, which are contemporaneous with the introduction of iron. This seems to coincide with the downfall of the Hittite Empire, about 1300 B.C.

Dr. Richter concludes from these and other facts that the primitive civilization of Cyprus was evolved independently of the East, and that it must be regarded as running in parallel lines with those of Egypt and of Mesopotamia. This culture may be traced through Asia Minor, the Greek Archipelago, Greece, and Europe at least as far as Königsberg. Its oldest vestiges in Cyprus he dates as far back as the third or fourth millenium B.C. Beyond, there are evidences of a preceding stone age. Of these earliest remains Dr. Richter makes two divisions. The oldest stratum produces no statuary, no inscriptions; but it contains hand-made pottery, and copper or weak bronze tools of small dimensions, in the smelting of which a weak alloy of zinc was used. In the second, or later, stratum of this archaic period, lance-heads appear, and with these are found vases of the Mykenæ type.

According to the facts which he has collected, the Greek influence felt here is that of the Peloponnesian tribes, the Arcadians,

Achæans, and the Laconians, whom he recognizes among the nations mentioned in the Egyptian texts (Akuaivasa, Sakalusa, etc.). It is to these, it would seem, that was due the invention of the sword, which first appears in Cyprus in the form of a much enlarged Cyprian dagger, and is found associated with Mykenæ pottery. It is also at this time that defensive metal armor occurs. Many of the statues of gods, priests, and others exhumed by Dr. Richter are represented wearing the round helmet with a ball-crest, which is depicted upon the Egyptian monuments as especially belonging to the Mediterranean peoples; and their general aspect also agrees with that attributed to these races by the Egyptian artists.

It will be remembered that these round helmets are mentioned, along with coats of mail, in Homer; and that, in the great epic, Agamemnon is represented as having obtained his equipment from Cyprus. The Cyprians continued famous as metallurgists, and, even after iron was introduced, their swords remained celebrated—at least we may judge so from the fact that Alexander the Great is stated to have carried a Cyprian sword.

Dr. Richter is now engaged upon the publication of a large illustrated work which will give a full account of his discoveries, with his interpretation of the facts that he has had the good fortune to bring to light in the twelve years of his Cyprian explorations. It is sincerely to be desired that he may be induced to follow Mr. Petrie's example; and that, along with the exhaustive volume more particularly intended for specialists, he will also publish a *résumé* embodying his principal results.

CLIFF- AND CAVE-DWELLERS OF CENTRAL ARIZONA.

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THERE is no part of the United States that is of more interest to the archæologist than our great south-west. This region, which includes all of Arizona, has but little rain, and during the long summer lies scorching under an almost tropical sun. It is true that in the mountains of the Territory the heat is greatly lessened, but from our geographical position we are subject to prolonged droughts for weeks and months at a time.

It is a question whether our present meteorological conditions are the same as when the cave- and cliff-dwellers cultivated fields upon our now barren mesas. Throughout this vast territory are hundreds of ruined casas and vacant caves, whose silent walls and rough-hewn stones are the only history we have of this early people. Whither they have gone and who they were is shrouded in the grave; neither the fierce Apache nor the more gentle tribes of the south know who were the architects of these interesting and wonderful structures. The Zuni and Moqui have been questioned, but without result. They all shake their heads. Even the oldest of the Indians, with traditions extending back many generations, know nothing of the builders of these old stone and adobe walls which have withstood the elements for so many years. At some future time these silent walls may speak out through the mind of man and give to the world glimpses into the history of a people who are now lost in antiquity. Peculiar marks on rocks and pottery all mean something, and the world is waiting for someone to unlock these closets and let a ray of light upon their mysterious symbols.

In the valley of the Verde River, not far from the now abandoned fort, and on the surrounding cliffs and hills are many old ruins. Many of these are as interesting and as little-known as any to be found in the south-west. Far from railroad and in a wild and rugged region, it is not strange that they have been studied so little. The banks of the river and many of its tributaries are lined with ruins. The prominent cliffs are crowned with walls of great flat stones, many of them as erected ages ago.

The clear water of Beaver Creek reaches the Verde a few rods above the old fort. A ride of several miles along this creek brings one to high cliffs extending a hundred or more feet above the waters of the creek. In the perpendicular walls of one of these cliffs is a well-preserved ruin known as Montezuma's castle. It is midway between the rim of the cliff and the bed of the stream, and is neither house nor cave, but a combination of the two. Not accessible from the summit of the cliff, it can only be reached

from below, and even here not without the use of a ladder, which, if short, must be pulled up from one ledge to another in making the ascent. The entire front is of artificial walls built of large, flat pieces of limestone, with openings here and there for doors and windows. The rooms are small, only about five feet to ceiling. Generally a small opening two or three feet in diameter joins one room with another, and a similar orifice in the ceiling

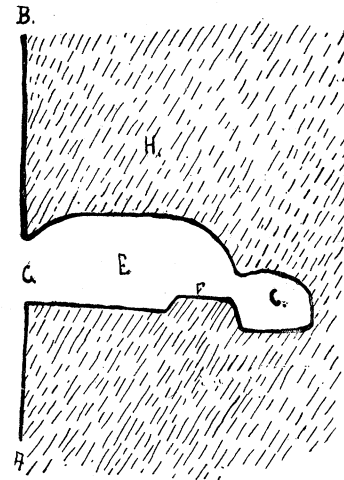


Diagram showing vertical section of cave at right-angles to cliff. The line *AB* represents face of cliff; *C*, a small cave at rear; *E*, main cave; *F*, rock bench; *G*, entrance; *H*, rock of cliff.

gives access to the room above. The ceilings are so low that steps are not necessary to pass from the first floor consecutively through the several stories of the structure. The openings in the ceilings never fall directly under each other. If the orifice is in the north-west corner in the first ceiling, it will be in the south-east corner in the next ceiling above, and so alternating back and forth to the top. This of course eliminates the possibility of falling more than five or six feet, or the height of one story. The

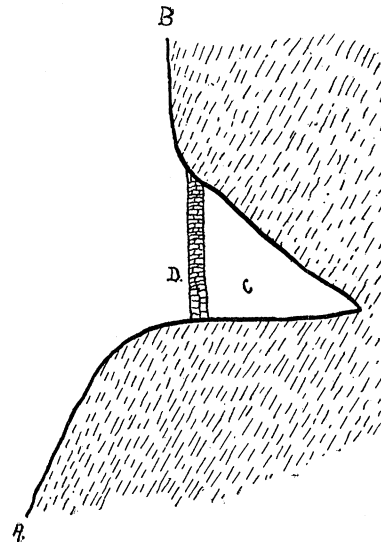


Diagram showing vertical section through large horizontal fissure; *AB*, line representing face of cliff; *C*, enclosed room; *D*, wall of masonry.

Type of pre-historic dwelling along the Grand Cañon of the Colorado River.

floors are mostly of flat stones supported on timber cut from the surrounding mountains.

Many of the timbers are perfectly sound, while others, where the rains have beaten against them, have decayed away and the floors fallen in. A few of the rooms facing the creek have cross-walls built of limestone, without mortar or cement of any kind. They all show considerable skill in their construction. The rooms at the rear are dark, dungeon-like caves hollowed from the solid