

Breasted

THE ORIGINS OF CIVILIZATION

By Professor JAMES HENRY BREASTED

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THE ORIGINS OF CIVILIZATION¹

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LECTURE ONE

FROM THE OLD STONE AGE TO THE DAWN OF CIVILIZATION

LINNAEUS was the first natural scientist to find a place for man in the natural system. There is an enormously long stage in the career of man when the study of him is obviously the task of the natural scientist. Much of the work of the anthropologist and psychologist is properly classed as natural science. At a certain stage in the development of man, however, we begin to call the study of him and his works archeology, history, philology, art and literature—lines of study which we sharply differentiate from natural science. I have often wondered what there is unnatural about man. If it could be demonstrated that the pterodactyl was gregarious, built towns, made pottery, carried on industry and commerce, and left behind written records, I fancy that we should still call the study of him paleontology and not divorce it from natural science.

It has been a source of great gratification to the writer that in the William Ellery Hale lectures on Evolution, the career of man has been regarded as a part of the course of nature. The protoplasm is indeed a long way from the idea of liberty and the chimpanzee may antedate by millions of years the conception of social justice, but the transition from the stage of biological to that of social processes is a gradual one, even though we readily recognize that man has finally risen to many qualities and ideas which transcend matter and can not be placed under the microscope or weighed in the chemist's balances.

¹ Delivered before the National Academy of Sciences in Washington, D. C., April 28 and 29, 1919, as the seventh series of lectures on the William Ellery Hale Foundation.

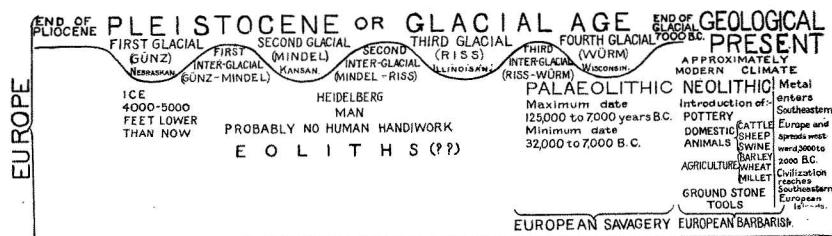


FIG. 1. DIAGRAM OF THE EUROPEAN GLACIAL AGE.

The archeologist depends on stratification just as the geologist does. He dates his strata not only by superposition, but also by the artifacts contained in them, precisely as the geologist dates his strata by the fossils they contain. As we all know, the prehistoric archeologist and the geologist work side by side, and each gladly accepts the other's results. This association brings us orientalists into intimate relations with natural science, for we carry on the work of research in the Near Orient, having, on the one hand, early prehistoric man *preceding* ancient Oriental civilization, and, on the other hand, historic Europe *following* the ancient Orient. The early Oriental civilizations thus occupy a place between the remote savagery of prehistoric Europe and the civilized career of historic Europe beginning in Greece and Italy.

My distinguished predecessors have carried the progressive development of matter through the origins of life and its evolution to ever higher forms, and have thus finally reached the early stages of the first implement-fashioning creature, which we call man. He has been followed by means of the trail of stone implements which he began to leave behind him, through the successive advances and retreats of the ice in the glacial epoch, oscillating like the pendulum of a vast geological clock, and thus measuring for us in large and still unprecise periods the several hundred thousand years of the discernible human career.

In the long struggle with the hostile forces of nature about him, the savage European hunter of the Paleolithic Age had slowly advanced through successive improvements of his weapons and tools of stone, bone, horn, ivory and wood, until the final retreat of the ice some seven or eight thousand years before the Christian era (Fig. 1). In spite of the remarkable progress which he had made and his surprising achievements in art, as illustrated in the wonderful cave paintings of southern France and northern Spain, it is evident that his general progress had been retarded as contrasted with the development of

the hunters of the Paleolithic Age on the south side of the Mediterranean. It is a natural conclusion that the retarding force was the recurring cold and ice by which Europe was so long beset, while the south side of the Mediterranean was enjoying far more genial conditions. It will therefore be necessary for us to investigate what was going on in northern Africa, long before the last glaciation of Europe had retreated. The presence of the great African mammals in glacial Europe, like the southern elephant (*Elephas meridionalis*) whose bones are found on the high terraces of the Seine and the Eure ninety feet above the present river level, demonstrates the connection of Europe with Africa in that distant age. Both at Gibraltar and through Sicily the great European peninsulas of the western Mediterranean were united with Africa by land (Fig. 2).

Just as the wild creatures crossed these land bridges from Africa to Europe and back again, so must the men who hunted them have done. The dispersion of the art of chipping flint implements throughout the contiguous areas of the two continents was a matter of course. Let it be clearly stated, however, that this unquestionable fact does not carry with it the conclu-



FIG. 2. MAP OF INTER-GLACIAL EUROPE. (After Geikie.) Showing landbridges between western Europe and Africa.

sion that the stages of prehistoric culture on both sides of the Mediterranean necessarily kept even pace with each other, and were therefore always contemporaneous. This we know was not true as between North and South America; neither was it true of prehistoric Africa and Europe. When the European Stone Age hunters received metal in the Aegean area about 3000 B.C., it was a thousand years before it had crossed Europe to Scandinavia and the British Isles. To speak of Mousterian flints found in Siberia as necessarily contemporary with those of France, is as absurd as to make Verestchagin, the Russian painter, contemporary with Titian.

The existence of North African man in European glacial times has been clearly demonstrated. The flint implements which he wrought have been found, still lying in strata of quaternary age in Algiers.² In the caves of Gafsa in Tunis Schweinfurth has also found flints of Paleolithic type, but not in stratifications or with a fauna which demonstrates their unquestionable Paleolithic age.³ In the same region, furthermore, Schweinfurth has found artifacts of even pre-Chellean types, lying in deposits of coarse conglomerate (*nagelfluh* or "poudingue" Fr.), which the discoverer concludes were of early quaternary date. He found 411 pieces, some of which he classifies as Eoliths and everything else as Chellean or pre-Chellean.⁴

These early Stone Age hunters of North Africa have left more than their stone implements to tell of their existence along the southern shores of the Mediterranean. In Algiers they carved in the natural rock faces rude drawings of the animals they were daily pursuing. One of these prehistoric drawings (Fig. 3) shows us the *Bubalus antiquus*, or ancient buffalo, a creature presumably of quaternary age in this region. This again demonstrates the presence of Paleolithic hunters in North Africa.⁵

It is evident that the Sahara desert during the age represented by such remains, must have been a fertile region, with productive soil and plentiful precipitation. This continued until the latter part of the glacial epoch; but in the last glaciation of Europe the climate along the Nile at least, was nearer that of to-day. Graffiti and Neolithic remains in the western

² See Boule, *L'Anthropologie*, 13, 1902, pp. 109-110, against Forbes, *Bull. Liverpool Mus.*, III., 1901, No. 2.

³ Schweinfurth, *Zeitschr. f. Ethn.*, 39, 1907, pp. 899-915.

⁴ Schweinfurth, *ibid.*, 39, 1907, pp. 137-181.

⁵ Pomel, *L'Anthropologie*, XI., also Obermaier, "Mensch der Vorzeit," p. 168.

Sahara would indicate its habitability, however, in time relatively recent, as the Neolithic of this region seems to have continued almost down to modern times.⁶ Gautier concludes that the changes here have not been due to alteration of the climate during the last two thousand years, but to desiccation caused by dunes, cutting off the Sudan from the Sahara, and resulting in its absorption by the Berbers from the north.

The probabilities certainly are that fertile conditions in the Sahara during the major portion of the Pleistocene permitted the distribution of the Paleolithic hunters from Algiers to the

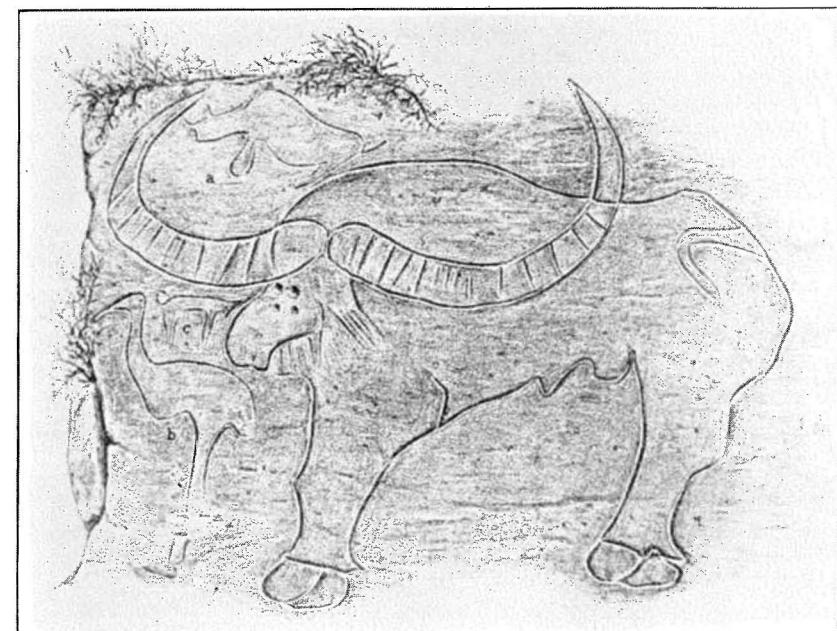


FIG. 3. ROCK GRAFFITO OF THE WILD BUFFALO (*Bubalus Antiquus*) IN ALGIERS. Carved by prehistoric hunters in the Palaeolithic Age. (After Pomel.)

Nile. But the Nile of that period offers a geological history which we must have in mind, because it went hand in hand with the career of man in northeastern Africa.

During or just before the formation of the lower levels of the Upper Pliocene, while the Mediterranean coast line was at the site of later Cairo, two extensive fractures occurred, varying from 7 to 24 km. apart. They extended southward from the coast some four hundred miles to the vicinity of Keneh, forming what is called a "block fault" in the earth's crust. As the block between the fractures sank it formed a great rift

⁶ E. F. Gautier, *L'Anthropologie*, 18 (1907), pp. 37-68, 314-332.

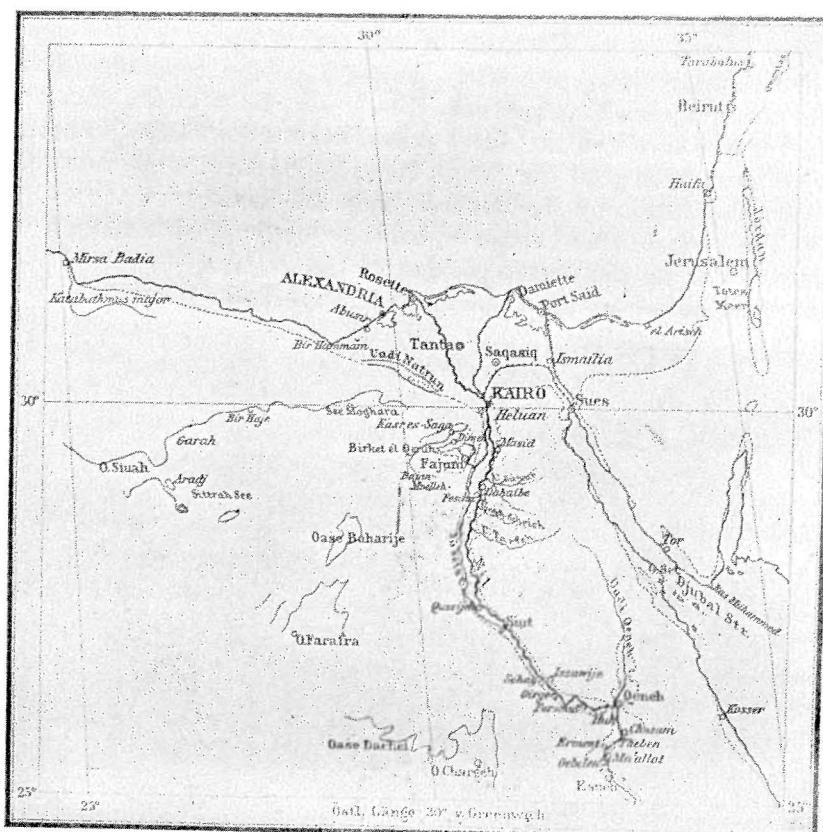


FIG. 4. MAP OF THE EGYPTIAN RIFT IN PLIOCENE-PLEISTOCENE TIMES. (After Blanckenhorn.)

or trench, stretching from the sea shore at the site of modern Cairo in latitude 30° N., to Keneh in latitude 26° 7' N. (Fig. 4). The entire rift is in the Eocene limestone. Other more local faults of varying origin carried the rift above Thebes, south of which (at Gebelen) it narrows. Measured along its bends the entire trench is almost 450 miles long. (Railway distance from Cairo to Luxor is 416 miles, and Gebelen is over 17 miles above Luxor.)

As Blanckenhorn, to whom we chiefly owe these facts, has shown,⁷ the rift was open to the sea, which entered and penetrated as far south as Dahaibe, then about ninety miles from the sea shore. Here must have been for a time the earliest mouth of the Nile. But this was much later. The intrusion of the sea fell in the transition from the upper Middle Pliocene to

⁷ Blanckenhorn, "Geschichte des Nil-Stroms," in *Zeitschrift der Gesellschaft für Erdkunde*, 1902, pp. 694-722 and 753-762.

the lower Upper Pliocene. It was contemporaneous with the beginning of increased precipitation in the Upper Pliocene, followed by the rainy transition period from the Pliocene to the Pleistocene, which Hull has called the Pluvial Period.

The narrow connection of the new Egyptian fjord with the sea was early largely blocked and the rapidly gathering fresh water of the east and northeast African drainage soon filled the rift and formed a large lake or series of lakes stretching from the region of Thebes to the sea. Into this lake or lakes plentiful streams flowed from east and west, carrying into the great trench extensive masses of conglomerates, gravels, marls, limestones, etc., which covered the bottom of the trench, and formed also in massive terraces of alternating limestone and indurated gravel along the walls of the rift (Fig. 5).

The characteristic fossil contained in these deposits is the lacustrine mollusc *Melanopsis*, the period of whose prevalence in this region seems to correspond to the already climatically cooled Upper Pliocene and Early Pleistocene especially of the first glaciation in Europe. This is at least the current and probable hypothesis. Accepting this probability, the earliest, that is to say the lacustrine, terraces of the Egyptian trench belong to late Pliocene and early Pleistocene times.

In the immediately succeeding drier period, corresponding to one of the early glacial periods (perhaps the first Inter-Glacial), the Nile stream for the first time appeared in this Egyptian rift. From this time on, river terraces were formed along its banks, though in relatively limited extent. Two of these river terraces can be discerned between the lacustrine terrace above and the alluvium below. The higher river terrace is from 6 to 30 m. (along its lower edge) above the level of the

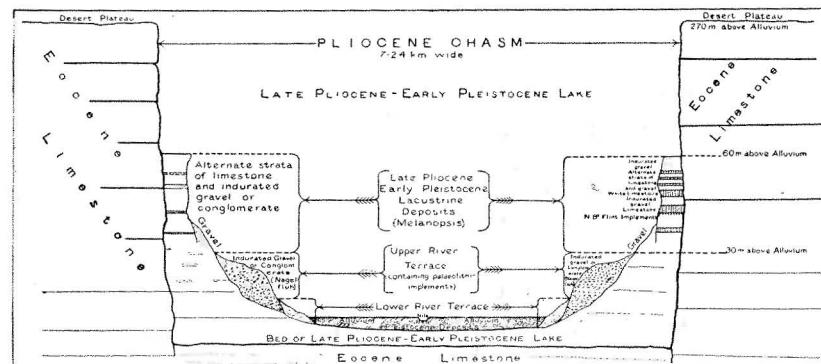


FIG. 5. SCHEMATIC CROSS-SECTION OF THE EGYPTIAN RIFT.

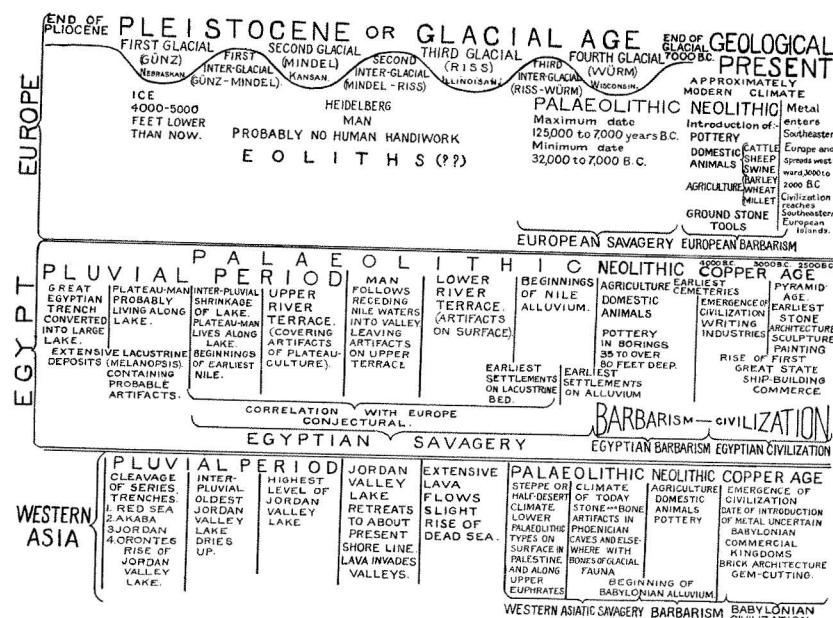


FIG. 6. DIAGRAM SHOWING ATTEMPTED CORRELATION OF GLACIAL EUROPE AND EGYPT.

alluvium; the lower is only 9 to 10 m. above the alluvium. The lower of the two is not everywhere observable or distinguishable, for like the typical Nile alluvium it also is made up of Nile mud, sand and fine gravel, without any coarse rubble, and it emerges as a more or less wide, gentle slope along the edge of the cultivated land, and is therefore not sharply distinguished from the latter.

The fauna of these Pleistocene deposits is confined as a rule to shells of fresh-water molluscs still living in the Nile. To these may be added only one extinct variety, the *Unio Schweinfurthi* (Martens). Very few remains of mammals have been found in deposits of this age, but they include buffalo horns and teeth of the hippo and elephant, while the marly lake deposits of the Fayum have yielded teeth, hoofs and leg bones of the horse. With these was also found the mandible of a man, later unfortunately lost. A comparison of this fauna with that of Syria has led Blanckenhorn to the conjecture, if not to the conclusion that in these southern lands, especially Egypt, there did not develop a pleistocene fauna analogous to that of glacial Europe—as if the climatic conditions, at least in the later Pleistocene, the time of prehistoric man, were not so different from those of to-day as in glaciated Europe.

After the formation of the two river terraces shown in the

cross section (Fig. 5), the Nile began laying down the present alluvial floor of the valley. For the deposit of this deep stratum of alluvium, varying from some thirty feet in depth at Thebes to over a hundred or even over a hundred and thirty feet in the Delta, it is evident that the relatively brief period since the retreat of the ice in Europe was quite insufficient. Blanckenhorn estimates that the lower half of the clayey sands and sandy clays forming so much of the Nile alluvium was deposited during the last glacial period of Europe.

To summarize, it will be seen that the geology of the Nile valley, in so far as it bears on the age of man there, displays four chief periods: I., The Lacustrine Terraces (=Pliocene and First Glacial?); II., The Upper River Terrace (=Second Glacial?); III., The Lower River Terrace (=Third Glacial?); IV., The Alluvium, Lower (=Fourth Glacial), Upper (=Post-Glacial?).

In view of the probability that the Lacustrine (Melanopsis) stage reaches over into the First Glacial, and the certainty that the lower Alluvium reaches back into the Fourth or Last Glacial it is tempting to make the Second and Third Glacial correspond respectively to the two River Terraces (Fig. 6). The four glacial ages would then be parallel with the four main periods disclosed by the Nile deposits. These geological parallels are in no sense vital to this presentation, however, with the exception of the conclusion, clearly demonstrated by Blanckenhorn, that

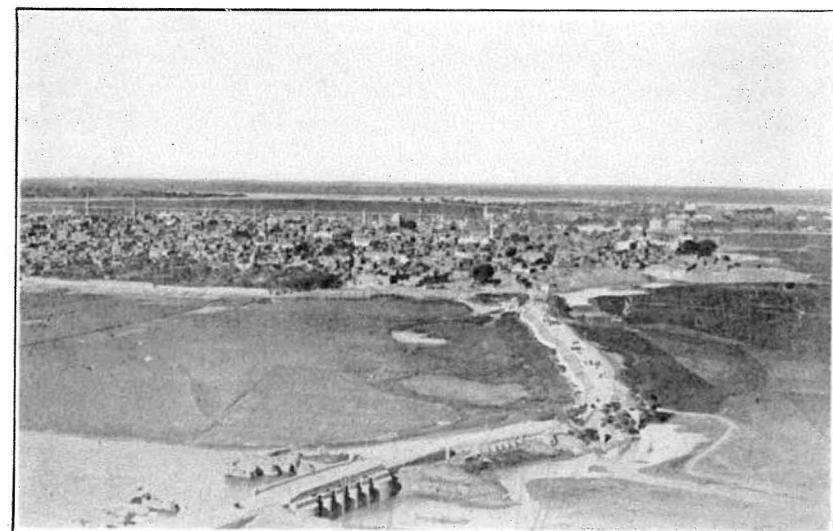


FIG. 7. THE NILE VALLEY ALLUVIUM AT SILT, seen from one of the lower river terraces.

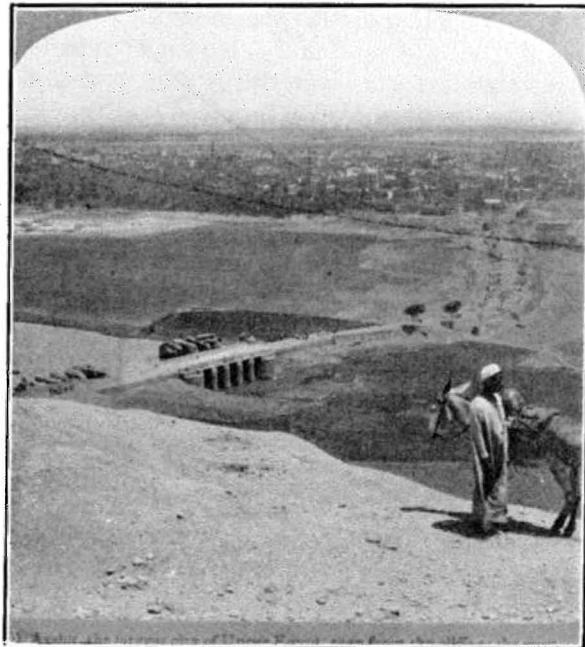


FIG. 8. THE NILE VALLEY ALLUVIUM AT SIUT, WITH RIVER TERRACE IN FOREGROUND.
(Photograph by Underwood & Underwood.)

the Lower Alluvium corresponds to the European Fourth Glacial.

Turning now to the Nile valley as we find it to-day, the view of Siut in Fig. 7 furnishes a characteristic prospect across the black alluvial floor of the Nile valley from the distant cliffs in the east, to the western cliffs from which the photograph is taken. As we step back up the slope, we include within the range of the camera one of the lower river terraces seen in the foreground of Fig. 8. Again the cliffs near Der el-Bahri at Thebes display characteristic formations of the Lacustrine Terraces, above those of the river (Fig. 10).

These terraces are clearly correlated in a geological map of the western cliffs of Thebes by Schweinfurth (Fig. 9). The band below shows the extent of the cultivated land, the alluvium; the next band above it represents the river terrace, presumably the upper, the lower disappearing at this place, while the uppermost band shows the situation of the lacustrine terraces. According to Blanckenhorn, it will be recalled, these lacustrine deposits, characterized by the fossil mollusc *Melanopsis*, were laid down in late Pliocene-early Pleistocene times; the upper levels therefore may belong in the First Glacial

Period of Europe. At that time the Sahara plateau was habitable, and discoveries of Schweinfurth would indicate that probably as early as the European First Glacial Period, men able to produce flint implements lived along the margin of the cliffs, above the lake here at Thebes.

If Schweinfurth is correct the rude artifacts produced by these men were carried by the drainage from the shores of their plateau dwellings into the lake, where they are now embedded deep in the lacustrine terraces below the brow of the cliffs. He

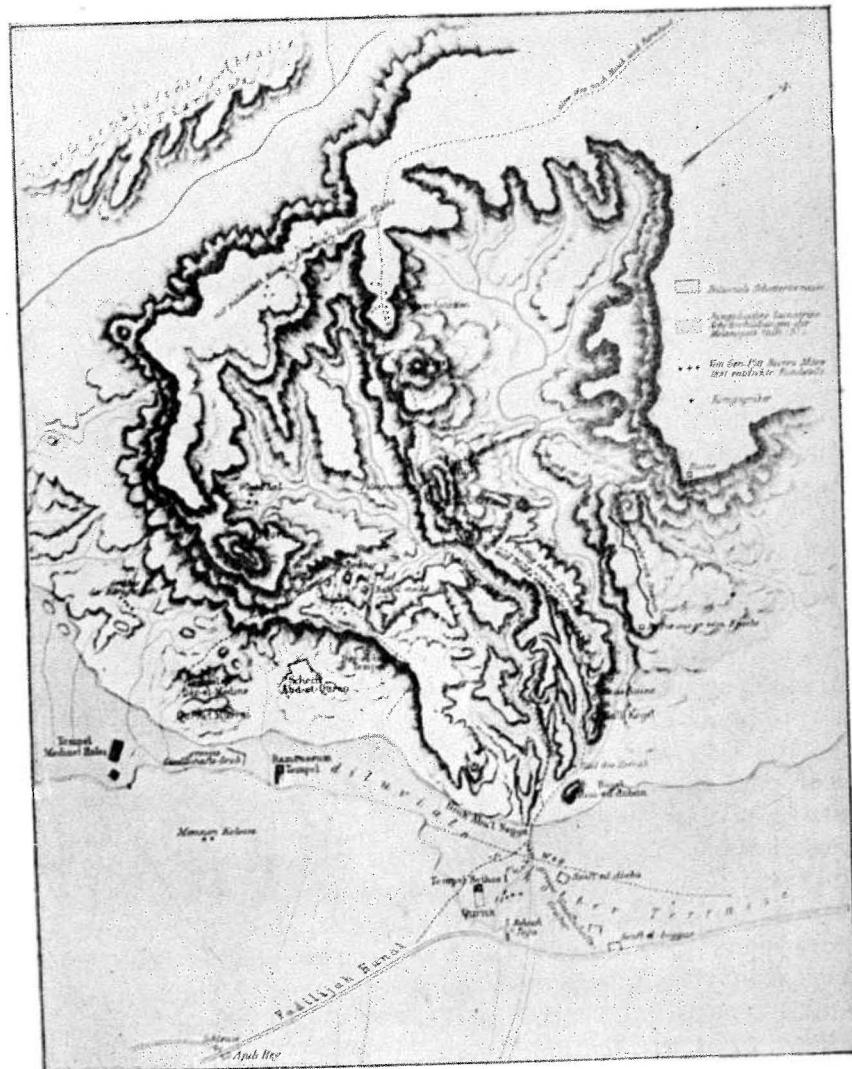


FIG. 9. GEOLOGICAL MAP OF WESTERN THEBES. (By Schweinfurth.)

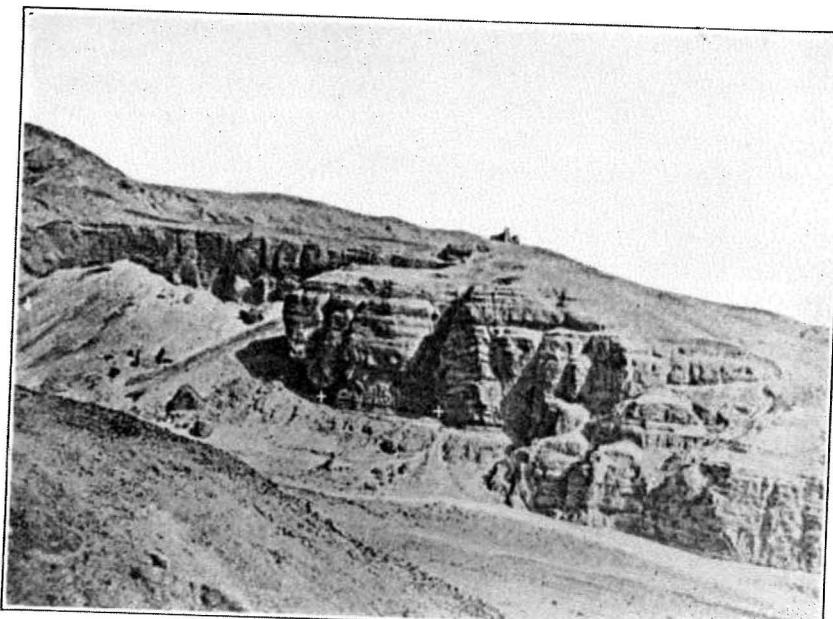


FIG. 10. THE LACUSTRINE TERRACES NEAR DER EL-BAHRI ON THE WEST SIDE AT THEBES. The levels containing artifacts are marked with a cross.
(After Schweinfurth.)

has found them below several alternate strata of limestone and indurated gravel, which have collected some fifty feet or more above the artifacts (Fig. 10).

One form believed by Schweinfurth to have been produced by the hand of man displays the familiar "bulb of percussion"; while the edges show evidences of secondary flaking (Fig. 11). The fact that this region was never visited by the ice, makes it more probable that such flints were produced by man, in the absence of the grinding, the pressure and other forces of the ice, to which the European "eoliths" were subjected.

However this may be, it is certain that far back in the European Glacial Age the North African plateau was inhabited as we have already seen. In hospitable as the stretches of the desert along the Nile valley now look, they were once the home of man. These early plateau hunters have left traces of their presence other than their flint weapons. In 1906 a native at Abu Simbel in northern Nubia assured me that he could take me out into the Sahara to an unknown temple of which so many vague reports had reached archeologists that it had long been known to us as "the lost temple." Several hours march from the Nile, far out in the western desert, we did indeed find it

(Fig. 12). It proved to be a natural rock formation, with a door wrought also by nature, and alongside the door the records which the natives had reported as inscriptions proved interesting enough. Here were carved two boats, two giraffes, two ostriches and a number of smaller animals. The giraffe has been extinct in Egypt from very remote times, and it is possible that the hunters of Pleistocene Age have left these records in the Sahara.

Just above Thebes along the crest of the cliffs behind the King's Tombs (Fig. 13), these early hunters had a number of workshops, and here worked flints are still scattered so plentifully that there are stretches kilometers long, where one literally walks on artifacts, and it is difficult to find a piece of flint produced by nature. The date of artifacts found thus lying on the surface is not to be determined by the shape, workmanship and type alone. Fortunately these same artifacts may also be stratigraphically dated in the immediate vicinity.

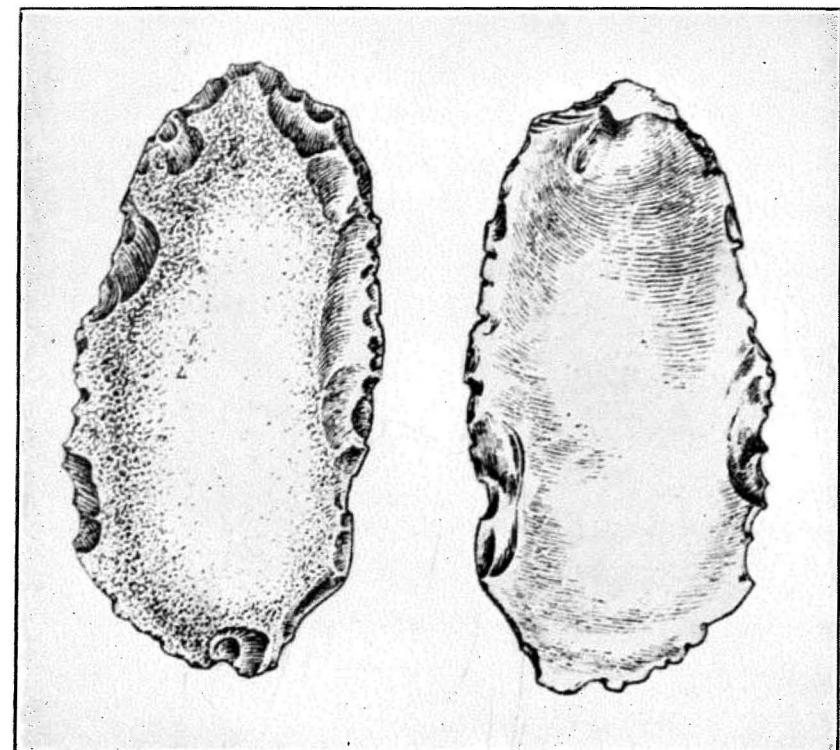


FIG. 11. HUMAN ARTIFACT FOUND WITH MANY OTHERS BY SCHWEINFURTH IN THE LACUSTRINE TERRACES OF THE NILE RIFT. They lay some fifty feet below the surface, at the point marked with a cross in Fig. 10.



FIG. 12. THE SO-CALLED LOST TEMPLE BEHIND ABU SIMBEL IN LOWER NUBIA.

As the great Egyptian lake shrank and the earliest Nile current began to move northward in the old bed of the lake, the drainage of the latter part of the Pluvial Period carried large masses of the neighboring rock rubbish into the valley, and

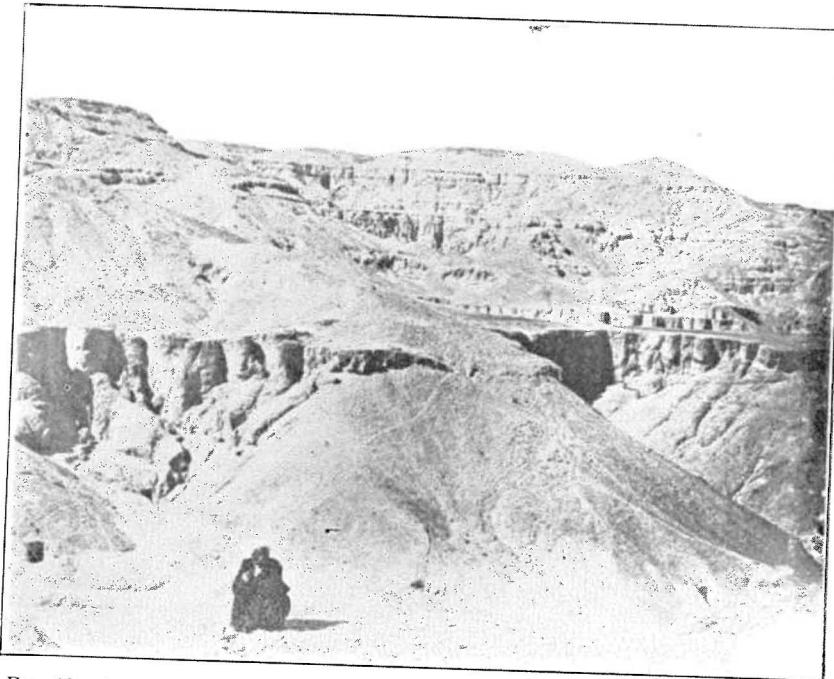


FIG. 13. THE HEIGHTS OF THE SAHARA PLATEAU ABOVE THEBES. Extensive flint workshops of quaternary age have been found lying on the surface of the plateau.

these materials helped to form the Upper River Terrace. They carried down with them numbers of the flint artifacts already lying on the plateau, and these early works of man are now found embedded in the conglomerate and indurated gravels of the Upper River Terrace. They were first noticed by Gen. Pitt-Rivers as far back as 1881, at a spot marked with a cross by Schweinfurth on his map (Fig. 9) near the mouth of the wadi called el-Wadiyén ("the two wadis") north of Seti I's Temple of Kurna, on the road to the Kings' Tombs.

Little attention was paid to Pitt-Rivers' discovery; but over twenty years later Schweinfurth placed its correctness beyond



FIG. 14. ROCK-HEWN TOMB COURT KNOWN AS "SAFT EL-LABEN." In the conglomerate walls of this court artifacts carried down by the drainage in Pleistocene times from the plateau above have been found. (Photograph by kindness of Winlock.)

all doubt. He found artifacts embedded in the strata of this river terrace at Kurna all along the lower end of the Wadiyén, and likewise in the neighboring large courts of the Egyptian tombs here. These courts are some 75 m. square, open on one side and with about twenty-five tomb doors cut in each of the remaining three sides (Fig. 14).

The investigations of Winlock of the Metropolitan Museum have made it extremely probable that these large courts and their arrangements belong to the Eleventh Dynasty (2160–2000 B.C.); that is to say they are over four thousand years old. The entire court and the tombs the doors of which are visible in

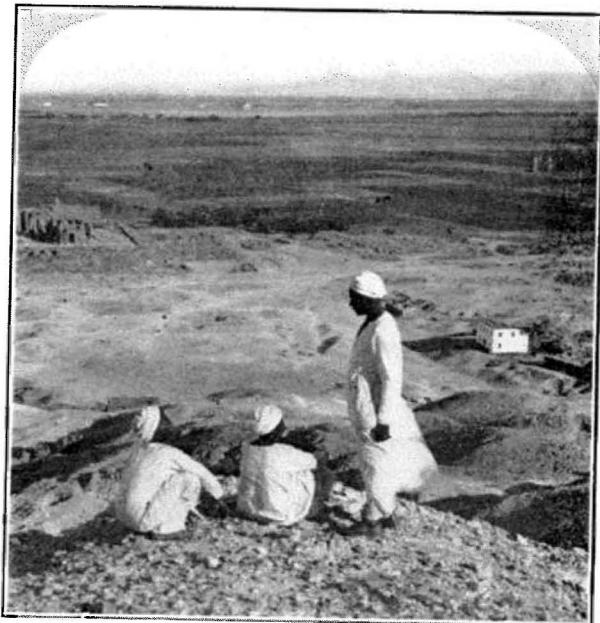


FIG. 15. RIVER TERRACE ALONG THE NILE AT THEBES. Here the plateau hunters lived when they shifted from the plateau down into the Nile Rift. (Photograph by Underwood & Underwood.)

Fig. 14 were therefore excavated from a conglomerate or "nagelfluh" formation, hard enough for such excavation over four thousand years ago. Here are thousands of square yards of wall surface embedded in which large numbers of flint artifacts may be found. It requires considerable effort with cold chisel and hammer to disengage these works of early man, thus embedded in a late rock formation.

The materials of which this conglomerate is composed show clearly that they came from the neighboring heights; and their situation at the lower end of a wadi leading down from the plateau leads to the same conclusion. Finally the artifacts contained in the formation are of the same types and workmanship as those found still lying on the plateau. The remains of man found in this terrace belong therefore to the plateau culture, and to a period of that culture long antedating the formation of the terrace.

When the Theban river terrace containing these artifacts was forming (compare Fig. 5), the earliest Nile was at least 15 to 20 meters (over 45-60 feet) above its present highest level. As the river declined in volume, probably during the Second Inter-Glacial of Europe (see Fig. 6), the plateau hunters began to

shift into the valley itself, and to occupy the stretches of terrace on the river's brink. Primeval forest alternated with marsh and jungle along a raging flood of the vast river. Here on the dry and exposed rubble heaps the plateau hunters took up their dwellings. They gradually transferred their flint workshops to the brow of the upper river terrace. Here their flint implements are still found lying on the surface (Fig. 15).

Their hearths and doubtless later their wattle huts were distributed along the river terrace not far from the cliffs behind; for the vantage ground between the foot of the cliffs and the river must have been scanty at first. It was natural that they should scratch their hunting records on the rocks of the cliffs behind their homes, and it is doubtless to this stage of human life in the Nile valley that we owe many of the game animals pictured on the rocks. At a somewhat later stage the reed floats which the former plateau hunters had learned to make for crossing the river along which they had now established their dwellings, were displaced by primitive wooden boats, the earliest known. Of these also, the hunters have carved rude pictures on the walls of the Nile rift (Fig. 16). The great age of these cliff pictures is interestingly shown by the fact that the areas cut away by the

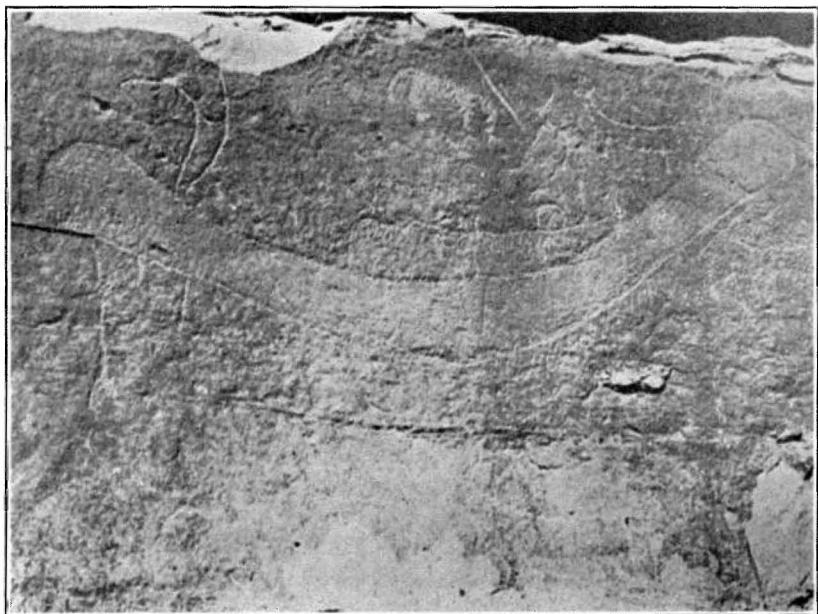


FIG. 16. CLIFF PICTURE OF A PRIMITIVE NILE HUNTER'S RUDE WOODEN BOAT. The earliest wooden craft known, cut on the cliffs at el-Kab. (After Green in *Proceedings of the Society of Biblical Archaeology*, Vol. XXV.)

ancient hunters in carving these figures are covered with a dense blackish brown patina, the somber raiment worn by all rocks in the desert and called by Walther "desert varnish." According to Lucas⁸ it is due to oxides of iron and manganese dissolved out of the stone by the rare rains and the dews, and changed on the surface by the heat into ferric oxide and manganese dioxide, which are insoluble and dark colored. The same conclusion was earlier published by Lortet and Hugounenq⁹; but Linck, on the contrary, maintains that the patina is due to a fine dust deposited by the winds, and adhering finally firmly to the surface, and that it comes from without, not from within the stone.¹⁰ However this may be, surfaces cut away in making hieroglyphic inscriptions some 4,500 to 5,000 years ago, have in this long interval gathered but slight traces of this desert varnish. We must conclude therefore that its presence on the cut surfaces of the prehistoric cliff pictures, if it does not demonstrate, is at least in harmony with, a very remote date for the hunters who wrought these earliest records in the Nile valley.

As the flint implements still lying on the surface show us, these earliest Egyptian hunters were advancing to occupy more and more of the valley, as the waters of the river receded. When the Nile had finally sunk to its present bed, these prehistoric Nile dwellers settled upon its shores. Often they must have dwelt directly on the dry rubble heaps and stretches of sand and clay, which once formed the bed of the Pliocene Egyptian lake. Then the river began laying down the alluvial floor which has now covered the remains of these prehistoric settlements on the old lacustrine bed of the valley. There they lie with thirty feet of alluvium over them, and there it will be impossible ever to recover them.

Thus in the Fourth Glacial Period of Europe the Nile began to deposit the fertile alluvial floor which now forms Egypt (Fig. 7). As this floor gradually spread on each side of the river, it greatly improved the conditions under which the Nile dwellers lived, and while the hunters of Europe were contending with cold and ice, these men of northeastern Africa were enjoying a mild climate, of unequaled salubrity, and likewise

⁸ "The Blackened Rocks of the Nile Cataracts," Survey Dept., Ministry of Finance, Cairo, 1905.

⁹ "Coloration noire des rochers formants les cataractes du Nil," *Comptes rendus, Acad. Sci.*, Tome 134, 1902, p. 109.

¹⁰ Linck, "Ueber die dunklen Rinden der Gesteine der Wuesten," *Jenaische Zeitschr. f. Naturwissensch.*, 35, 1900, pp. 329-336; quoted by Schweinfurth in *Zeitschr. f. Ethn.*, 35, 1903, p. 815.

freedom from the formidable mammals which confronted the European hunters.

Proof of the existence of these remote prehistoric settlements on the lower alluvium is not wanting, although it has thus far been found only in the general latitude of the southern apex of the delta. From 1851 to 1854 L. Horner sank ninety-five pits and borings down through the alluvium in this region.¹¹ "In a large majority of the excavations and borings, the sedi-

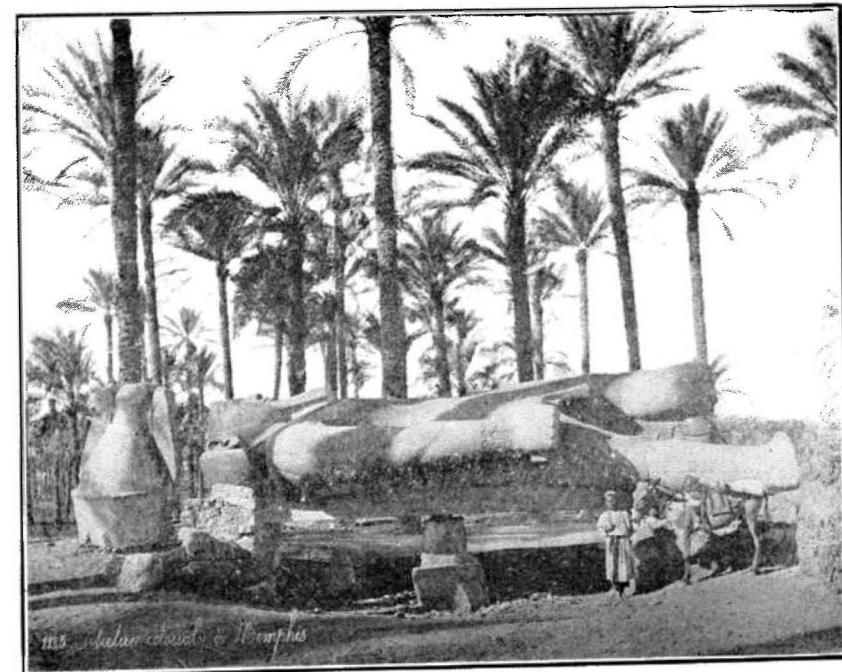


FIG. 17. PROSTRATE COLOSSAL PORTRAIT OF RAMSES II. AT MEMPHIS.

ment was found to contain, at various depths and frequently at the lowest, small fragments of burnt brick and of pottery." We know that burnt brick could not possibly have existed in the days of the dwellers on the lower alluvium, and Horner's "burnt brick" must therefore have been simply larger fragments of pottery. His shafts around the colossal statue of Ramses II. at Memphis (Fig. 17) disclosed the lower courses of the substructure supporting the statue. He also reached the bottom of the substructure under the obelisk of Sesostris I.

¹¹ See L. Horner, "An Account of some Recent Researches near Cairo, undertaken with the View of throwing Light upon the Geological History of the Alluvial Land of Egypt," *Philosophical Transactions of the Royal Society*, Vol. 145, 1855, pp. 105-138, and Vol. 148, 1858, pp. 53-92.

at Heliopolis. His measurements enable us to compute the rate at which the alluvium has accumulated in this latitude during the last three or four thousand years. Since about 1950 B.C. the rate of accumulation at the obelisk of Sesostris I. has been about 3.90 inches per century, while at the Memphite colossus of Ramses II., since the thirteenth century B.C., it has been about 4.08 inches. There is a slight margin of uncertainty due to our ignorance of the exact ancient level of the alluvium on the substructures and our ignorance of the exact dates of the monuments.¹² The borings in the latitude of the obelisk, but on the opposite side of the Nile brought up pottery from depths as great as fifty feet, or even nearly sixty feet. Using the rate of accumulation for the latitude of the obelisk, we gain a date of about 15,641 to 18,410 years before 1854 for the people of the lower alluvium. That is, the indications are that these earliest makers of pottery lived from 15,700 to 18,500 years ago.

Even larger figures than these would result from computations based on the discovery of pottery in the lower alluvium at a depth of 22 meters at the southern apex of the delta by Linant Bey; or at 27 meters on the Mahmudieh Canal by Abel.¹³ On the Damietta branch in the delta Schweinfurth reports a human skull found at a depth of 24 meters.¹⁴ It will be seen that the results of computation based upon such facts as these accord very well with Blanckenhorn's demonstration that the alluvium of Egypt began to be laid down long before the end of the last European glacial period, some eight or ten thousand years ago.

The earliest settlements on the old lake bottom and along the gradually widening strip of earliest alluvium have been deeply buried by the thick stratum of the upper alluvium which now floors the valley and covers the whole space between the river terraces (Fig. 18). There lies buried all that remains of the story of an advance through the possession of pottery, the gradually acquired ability to cultivate the wild grasses, the ancestors of our own cultivated cereals, and also the conquest of the wild life and its transformation into our domestic animals. The men who accomplished these things gradually reclaimed the jungles of the Nile rift, and as the valley then enjoyed but scanty rainfall, they began to cut the first trenches

¹² Horner's calculations of the rate are vitiated by the incorrect dates for the monuments themselves current in his day.

¹³ DeMorgan, "Recherches sur les Origines," I., Paris, 1896, p. 19.

¹⁴ In Blanckenhorn, "Geschichte des Nilstroms," *Zeitschr. der Gesell. für Erdkunde*, 1902, 761.

for the irrigation of their little fields, the predecessors of the irrigation canals which we survey from the top of the Great Pyramid. Thus these earliest Nile dwellers slowly shifted from the life of hunters to that of tillers of the soil and breeders of flocks and herds.

As generation followed generation it was found to absorb too much of the cultivable area to bury the dead in the alluvium. They therefore began to make their cemeteries just outside of the alluvium, along its margin. As the rising alluvium spread

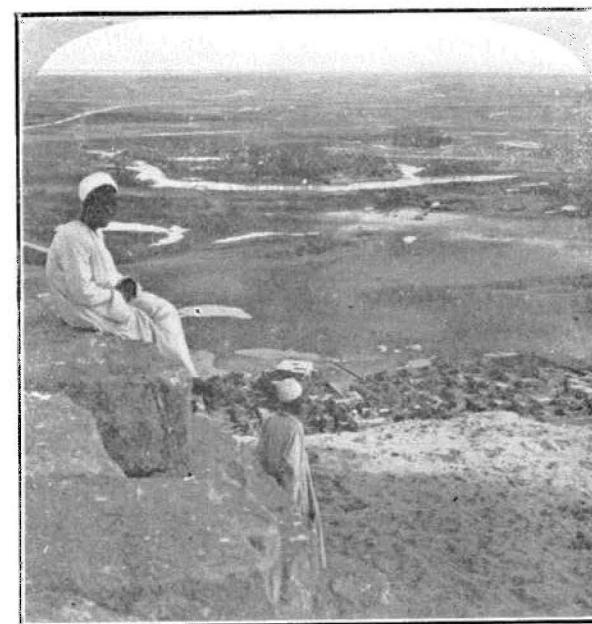


FIG. 18. THE SURFACE OF THE PRESENT UPPER ALLUVIUM OF THE NILE VALLEY. Now covering the remains of the earliest human settlements on the floor of the rift or lake bottom,—as seen from the top of the Great Pyramid. (Photograph by Underwood & Underwood.)

out over the valley across the old lake bottom, these cemeteries were covered up in their turn. There can be little doubt that they stretch in a long wandering line, roughly parallel with the edge of the alluvium which now covers them. They are not below the limit of excavation—at least the later ones would be within reach of the excavator, if they could be located. Excavation would then be quite feasible. The problem of determining the location could be solved by boring, and this should be begun on a large scale all along the margin of the alluvium, in the endeavor to find a cemetery. A single cemetery

thus discovered might reveal to us the pottery, stone implements, probably cultivated grain and even domestic animals as well as the bones and skulls of an Egyptian community thousands of years older than any predynastic community now known to us. It would furnish us with a single mile post between the Egyptian whose stone implements we have found on the river terraces, or whose pottery has been disclosed by the borings already mentioned on the one hand, and on the other the prehistoric Egyptian in possession of grain, domestic animals and metal as we find him in the earliest cemeteries now known.

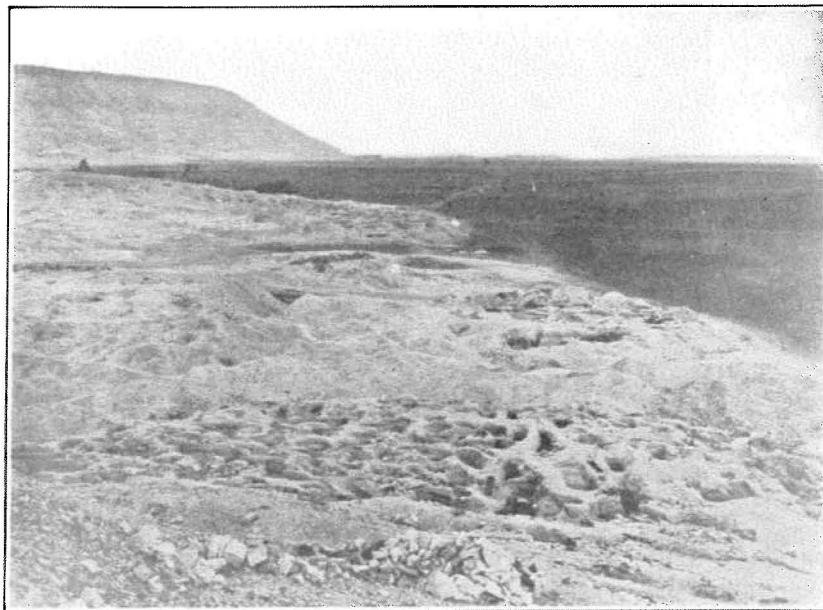


FIG. 19. A GROUP OF EARLY EGYPTIAN CEMETERIES ALONG THE RIVER TERRACE. Just outside the margin of the alluvium. (After Reisner, "Naga ed-Der," I, pl. 2.)

The supposition that the cemeteries of the lower alluvial period were placed along the margin of the alluvium and just outside it, is based on good evidence. The earliest cemeteries known occupy this very position (Fig. 19). When they were first discovered about twenty-five years ago (1894-5), they suddenly revealed to us a group of pre-dynastic Egyptian communities, the earliest of which were already acquainted with metal (copper), though it was not yet plentifully used for implements. These cemeteries therefore represented an outgoing Neolithic stage. A quarter of a century of excavation among

these cemeteries has not yet carried us back into a pure Neolithic stage of culture. Must we therefore suppose that there never was any pure Neolithic culture in the Nile valley?—that the uninhabited Nile rift was invaded by outsiders already acquainted with metal?—and that for this reason the cemeteries of a metal-using people suddenly begin some centuries before 4000 B.C.? If we answer this question in the affirmative, we must assume the extinction or emigration of the pottery-makers disclosed by the borings in the lower alluvium. A population which had earlier maintained itself for many thousands of years along the Egyptian rift from the days of the plateau hunters, through their descent to the river terraces, until their occupancy of the lower alluvium and the discovery of pottery—after this enormously long occupation of the region—can not be conceived to have disappeared from northeastern Africa, leaving it uninhabited until some centuries before 4000 B.C.

It is consequently impossible to conclude that the pre-dynastic cemeteries begin suddenly and abruptly, marking the reappearance of man in the Nile rift after a period of thousands of years without any human inhabitants there. We must conclude, therefore, as we have done above, that the cemeteries which might reveal the successive earlier stages of a pure Neolithic, pre-metallic culture, bridging the present gap between the pottery-makers of the lower alluvium and the earliest pre-dynastic cemeteries now known, will be found under the present margins of the alluvium. Indeed my friend Mr. A. M. Lythgoe, of the Metropolitan Museum, while he expressed some reserve toward the above hypothesis when I proposed it to him, at the same time told me that he knew of one of the earlier cemeteries of which one edge was covered by the alluvium.

While there is a gap in our knowledge between the men of the lower alluvium revealed by the pottery of the borings and the men of the cemetery burials, it is evident that during the period represented by this gap the favored hunters of the Nile valley, not being exposed to the ice and cold of glaciated Europe, were able because of this sheltered situation in northeastern Africa, to advance so fast that they left far behind their Stone Age contemporaries all around the Mediterranean. This is shown at once in the quality of their stone implements, which had during this interval reached what we may call the Neolithic stage. The successive earlier stages represented by the flint artifacts at first left on the plateau and afterward on or embedded in the river terraces, while they were probably earlier than the Paleolithic implements of Europe, roughly correspond

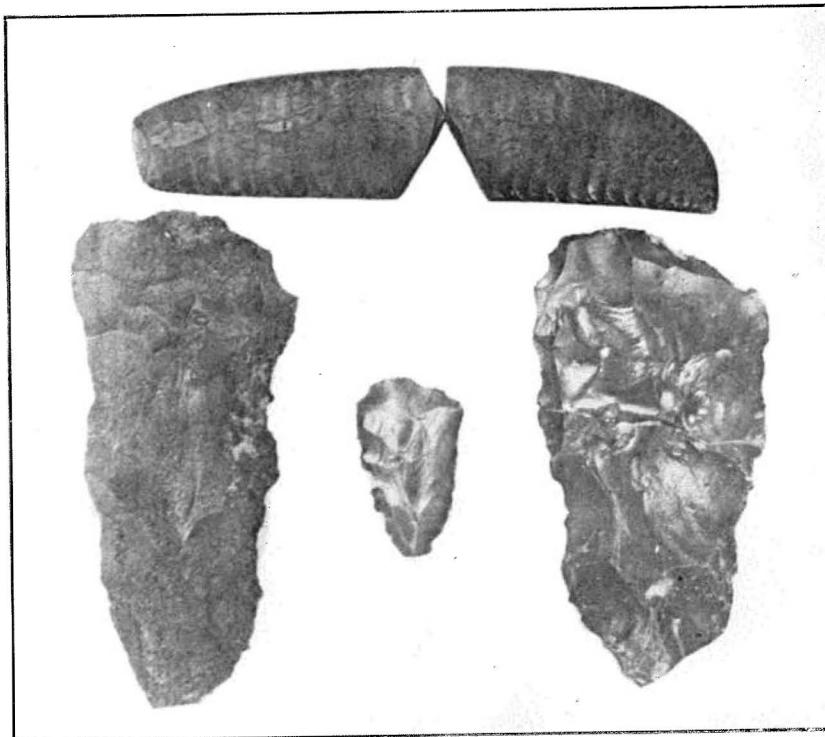


FIG. 20. THREE STAGES OF FLINT IMPLEMENTS FROM NORTHEAST AFRICA. The two below at right from the plateau; all three below are probably Palaeolithic; the "ripple-flaked" knife above is from a pre-dynastic burial.

genetically to a Paleolithic stage of work (see lower artifacts in Fig. 20). The progress in the gap preceding the earliest cemeteries carried the Nile-dwellers forward to a Neolithic stage represented even in the earliest burials by superb "ripple-flaked" knives (see Figs. 20, 21). Nothing illustrates the superiority of the prehistoric Egyptian over all his contemporaries in other lands more conclusively than the remarkable precision, beauty and regularity of these flint knives. Nowhere in the world, indeed, have Neolithic craftsmen ever produced anything which can be compared with this work. This advance of Egypt demonstrates an industrial superiority over Europe and Asia beginning in the middle of the fifth millennium B.C., which was maintained some four thousand years and was never lost until the advance of Greek industry and commerce in the sixth century B.C.

The other leading craft possessed by these men of the earliest cemeteries was that of making pottery (Fig. 22), as we

might expect in view of the fact that their ancestors of the lower alluvium were already producing it. It contained a large proportion of Nile mud, and with its black-topped, red polished forms, or red polished with white line decoration and brown or black incised, this earliest cemetery ware is now well known.

It is impossible to offer here a complete inventory of the content of these earliest known burials in the Nile valley, but we may notice the presence of hand-bored stone vessels, face-paint palettes made of slate, and often bearing traces of the face-paint once ground upon them; besides many objects of ivory, like "figures, combs, hair pins, bracelets, rings, vessels, harpoons, etc."¹⁵

The people who thus equipped their dead lived in small settlements along the margin of the alluvium; for the presence of the cemetery of course means that a community of living people dwelt not far away in the cultivated area. A group of wattle huts furnished their dwellings, and around these stretched fields of barley, millet and wheat, with patches of flax, while grazing near were flocks of sheep and goats, and herds of long-horned cattle. Donkeys were already bearing the peasant's burdens from field to village, or village to market. The

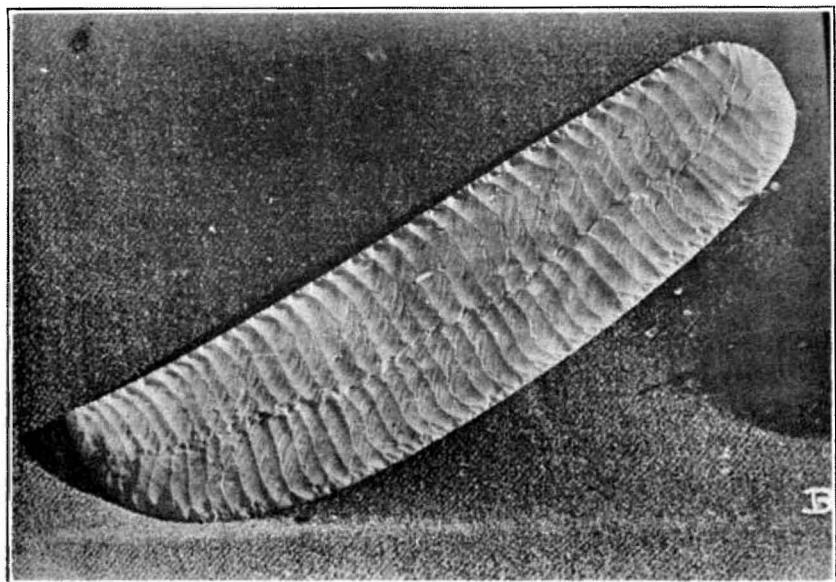


FIG. 21. FLINT KNIFE, RIPPLE-FLAKED ON ONE SIDE AND GROUND ON THE OTHER. From a burial in the pre-historic cemetery of Abadiyeh, Egypt. (Photograph by Petrie.)

¹⁵ Reisner, "Archaeological Survey of Nubia," Vol. I., p. 316.

great jungles and marshes which once stretched far along the valley, the home of the tropical beasts so long pursued by the plateau hunters and the men of the river terraces, had now been reclaimed and drained and made fit for cultivation of vegetable foods, or the pasturage of flocks and herds. A vast northeast African game preserve had thus been transformed from a jungle into the fertile home of the earliest cultivators of the soil

and breeders of cattle and sheep anywhere known on earth. The settlements of these earliest agriculturists and cattlebreeders stretched far along the valley from lower Nubia¹⁶ to the sea, and now these vanished generations, who originated animal husbandry and domesticated our food-grains still sleep in these cemeteries, scattered along the margin of the alluvium. Their villages have disappeared, but these cemeteries, discovered only twenty-five years ago, are great repositories of the life which once went on in the vanished settlements.

FIG. 22. POTTERY IN AN EARLY PREDYNASTIC BURIAL IN EGYPT. (After photograph by Reisner.)

The character of the food supply is revealed by an examination of the bodies from these cemeteries. The stomachs and alimentary tracts of practically all such bodies from the very earliest cemeteries contain husks of barley, while about ten per cent. also contain millet (*Panicum colonum*) of a species no longer cultivated. The husks of barley are much more difficult to detach from the kernel than those of wheat or emmer, the other prehistoric cultivated grains, and these latter, though they did not carry their husks with them into the bread, may also have been present in the bodies examined,¹⁷ but do not happen to be represented by husks.

Emmer is a kind of split wheat (*Triticum dicoccum*), now very little cultivated. The wild form called by Koernicke and

¹⁶ Reisner, "Archaeological Survey of Nubia," Vol. I.

¹⁷ See remarks of Netolitzky, to whom these researches were entrusted by Elliot Smith, in Hrozny, "Getreide," p. 178.



Aaronsohn *Triticum dicoccum dicoccoides* (better by Cook, *T. hermonis*), was discovered by Aaronsohn in 1906 on and around Mt. Hermon in north Palestine, and later as far south as Moab in the trans-Jordan country. In 1910 it was also discovered in western Persia on the Kermanshah road in the Zagros Mountains. There is no doubt, according to Koernicke, that we must recognize in wild emmer the ancestor of cultivated wheat. The

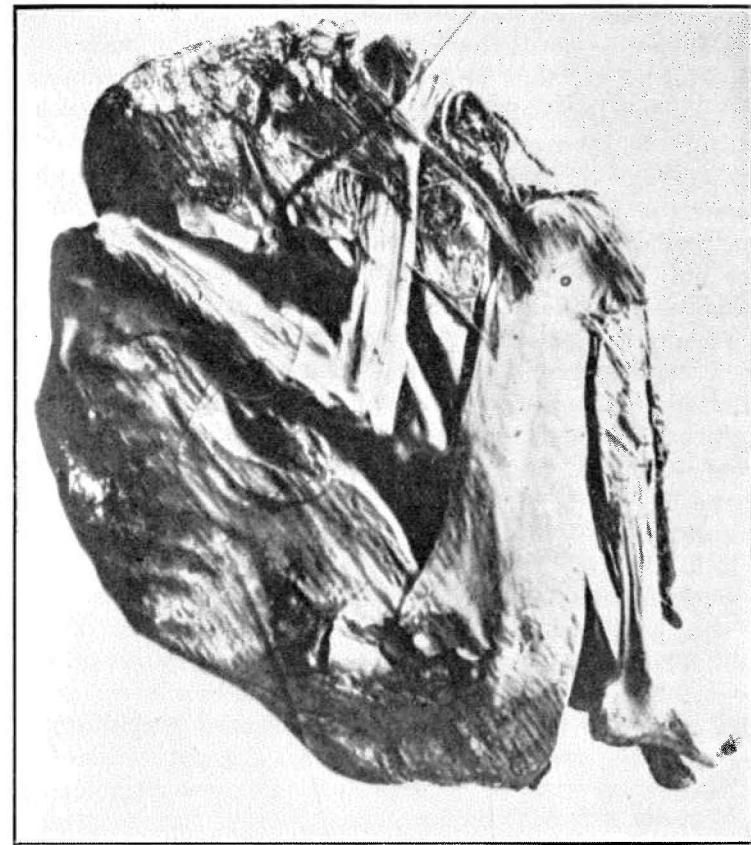


FIG. 23. BODY OF A WOMAN FROM A PREDYNASTIC BURIAL IN EGYPT. In the Field Museum of Natural History, Chicago.

cultivated form of emmer differs but slightly from the wild variety, and the development of our common varieties of wheat (*T. vulgare*, *turgidum*, etc.) must have consumed a long period of time, and required persistent practise of selection. Nevertheless, domestic wheat, with its long career of selective cultivation behind it, already appears in these earliest Egyptian communities, along with the little altered cultivated emmer.

It is interesting to notice that wild emmer is always found growing together with wild barley (*Hordeum spontaneum*), which is common in western Asia. The two were without doubt used together as food by early man, while they were still in a wild state, and domesticated together. Whether all this was done in western Asia or northeastern Africa can be determined with certainty, if ever, only when the botanical exploration of the Near East, at present hardly begun, shall have been thoroughly completed.

It should be noted that the grain found in the bodies of the prehistoric Egyptians and in the pottery jars accompanying them, dating back of 4000 B.C., is the oldest cultivated grain known to us, by over a thousand years. The nummulitic limestone crevices in which Aaronsohn found wild emmer growing in Palestine, are of course plentiful along the Nile, for such stone forms much of the material out of which the Nile terraces were built up. Here then, after using the wild barley and emmer seeds as food for ages, these early Nile dwellers may have begun to plant and cultivate them. It is only after ages of selective cultivation, as shown by the wheat, that the situation is revealed to us in these oldest cemeteries of the world. The long process of selective cultivation which had produced wheat before 4000 B.C., might therefore carry us back of 5000 B.C. for the beginning of the cultivation of grain, and the rise of agriculture.

It is also important to notice that such bodies as Fig. 23 often lie on a reed mat, with flaxen cord, and that some of them are wrapped in linen already displaying a good deal of textile skill. This is the oldest linen known to us, by an enormous margin. The fields of flax which furnished this linen represent a flax culture already very old, and descended probably from a time when the Nile dwellers originated the cultivation of flax.

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THE ORIGINS OF CIVILIZATION

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LECTURE ONE

FROM THE OLD STONE AGE TO THE DAWN OF CIVILIZATION. II

THE evidence for the possession of domestic animals is not as old as that for agriculture. The bodies from the earliest Egyptian cemeteries contain fragments of bones of mammals, but there is no way to prove that these necessarily small fragments belonged to *domesticated* mammals. Nevertheless, the results of long continued selective breeding demonstrate the remote origin of domestic animals in the Nile valley. At the same time the monuments reveal the Egyptians as persistently practising domestication far down in the historic age.

Pre-dynastic reliefs (Fig. 24) to be dated not later than the middle of the fourth millennium B.C., already show us three of the commonest domestic animals, the donkey, sheep and cattle. The domesticated donkey of Egypt was long ago demonstrated by Schweinfurth and others to have had its original home in northeast Africa and to have been domesticated on the Nile. Its wild ancestor, *Asinus tæniopus*, or the steppe ass, is still found as far north as the mountains of southern Nubia.¹⁸

The sheep shown in this carving still display primitive characteristics, carried over into the domesticated state, *e. g.*, standing ears and a mane, and the female with horns, which she later lost. They have been identified as *Ovis longipes palæoægypticus* by Duerst and Gaillard. Their nearest relatives, as both these two scientists admit, are still scattered over north and northeast Africa to-day. It is the more remarkable that these two paleontologists would draw this sheep from Asia. Lortet, on the basis of far more material, states that this sheep (*Ovis longipes pal.*) with transverse horns, spirally twisted, has so many and so widely distributed relatives in north Africa, that he must be considered as indigenous there.¹⁹

Regarding the large cattle shown here the paleontologists have differed widely, with perhaps a majority maintaining his Asiatic origin, due to the fact that they were unable to find an unmistakable wild ancestor in Africa. His alleged Asiatic origin has been commonly asserted in popular books, coupled with such a remote date for his domestication, and his intro-

¹⁸ Schweinfurth, *Zeitschr. f. Ethn.*, 44, 1912, pp. 653-654.

¹⁹ Lortet-Gaillard, "La Faune Momifiée de l'ancienne Egypte," Lyons, 1905, p. 100.

duction into Egypt by some mysterious and unidentifiable immigrants alleged to have brought in Egyptian civilization from Asia, that we now find a widely circulating popular statement, to the effect that the Asiatic origin of Egyptian domestic animals has demonstrated the Asiatic origin of Egyptian civilization.

Both the monuments and the still largely unexplored Pleistocene strata of Egypt contain much evidence on this question.



FIG. 24. EGYPTIAN RELIEF CARVED IN SLATE, DATING ABOUT THE MIDDLE OF THE FOURTH MILLENNIUM, B.C. Showing domesticated sheep (below), donkeys (middle), and cattle (above), captured from the Libyans. Now in the National Museum at Cairo.

It quickly disposes of the Asiatic origin of these long-horned cattle. Much inscriptional evidence has shown that the Egyptians practised the hunting of wild cattle, but a relief in Beni Hasan which shows these cattle as spotted has led to the conclusion that such alleged wild cattle were really domestic breeds which had escaped from captivity and were running wild. The discovery of a relief of the Pyramid Age showing a hunting enclosure (Fig. 25) filled with game to be brought down by the royal arrows, has effectually disposed of this conclusion. Among the game entrapped in the enclosure we find a cow. *

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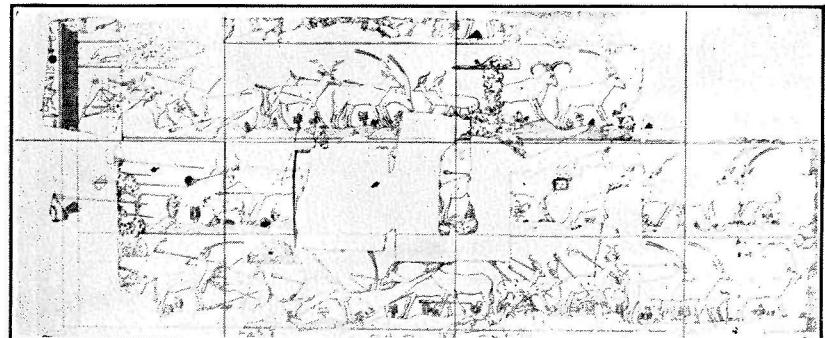


FIG. 25. ANCIENT EGYPTIAN RELIEF SHOWING A ROYAL HUNTING ENCLOSURE FILLED WITH WOUNDED ANIMALS. From the pyramid temple of Sahure, middle of the 28th century B.C. (After Borchardt.)

calf and a bull, all of a red brown color with a lighter saddle. These are unquestionably long-horned wild cattle, identified by Hilzheimer as *Bos africanus*. Pleistocene wild cattle have been proven to have existed in Algiers, and this evidence is now supplemented by the discovery of the fragment of a head of *Bos primigenius* in the Nile valley, in the Pleistocene deposits of the Fayum. The presence of the Urus thus demonstrated in Egypt has led Hilzheimer to recognize the wild cattle in this hunting scene also as the *Bos primigenius*. In any case it is totally gratuitous to identify any longer the long-horned cattle of Egypt with an Asiatic species.

It is very instructive in this connection to notice that the Egyptian continued his efforts at domestication on a wide range of wild creatures, far down into the historic epoch. In the scene under discussion (Fig. 25), dating from the middle of the twenty-eighth century B.C., we see the enclosure, which has been well said to be of itself a long step toward domestication. Here have been caught the deer, the gazelle, the oryx, the addax, and two varieties of goat. Of the leading Egyptian antelopes only the ibex is lacking. The practice of capturing these animals in an enclosure evidently very early showed the Egyptian that he might in this way maintain a store of meat on the hoof from which he could conveniently draw at will. In this way, for example, the Tschuktchi of northeast Asia maintain herds of half-domesticated reindeer, which they employ only as sources of flesh and skin clothing. These wild creatures taken out of such enclosures alive were then stall-fed and partially if not wholly domesticated. We see them in the tomb reliefs between 3000 and 2500 B.C. (e.g., Fig. 26), along with the long-horned *Bos africanus*, tied to their mangers and feeding. Here are the goat (*Hircus mambrinus*), the gazelle (*Ga-*

zella dorcas), the addax (*Addax nasomaculata*), the oryx (*Oryx leucoryx*) and remarkably enough, the hyena (*Hyæna striata*).

The inscriptions confirm these relief pictures very conclusively. A mortuary text of the Middle Kingdom (around 2000 B.C.) mentions "ibexes which eat grain." Similarly already in the twenty-seventh century B.C., the tomb of Kegemni mentions "stables of the plateau antelopes" (Fig. 27). There were thus "stables" for these creatures, parallel with the stables for the large cattle, and designated by the same word. It is of course a scene from one of these stables which shows these animals eating at their mangers (Fig. 26).

These animals therefore formed a staple source of the food supply and we find them in process of being slaughtered for food, precisely as is done with the large cattle (Fig. 28). Hence at an inspection of the cattle of an estate, these creatures which we have never thought of as domesticated, duly appear together with the long-horn cattle familiar to us as domestic animals (Fig. 29).

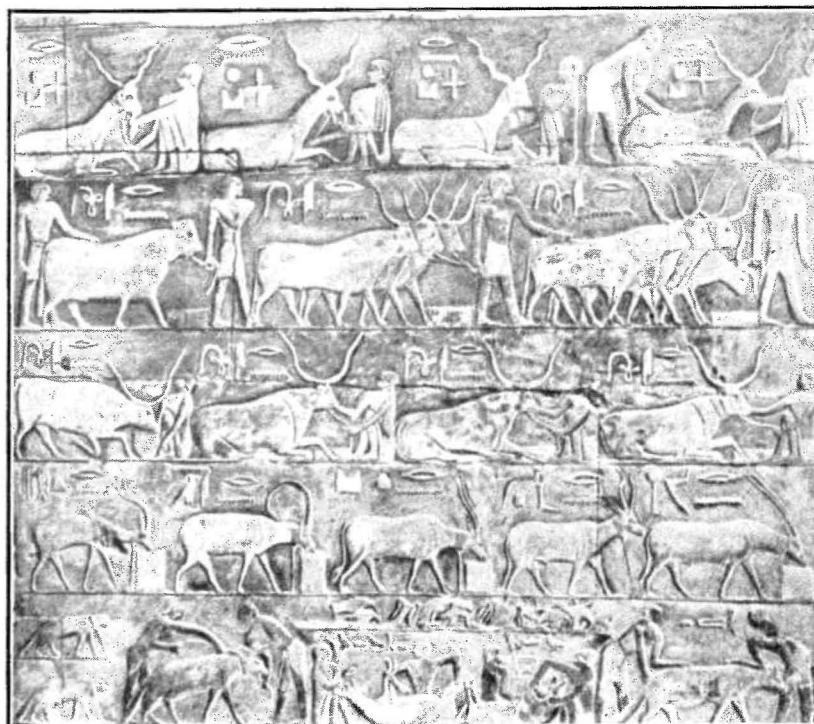


FIG. 26. STALL FEEDING OF SEMI-DOMESTICATED ANTILOPES (FIVE VARIETIES) AND HYENAS, ALONG WITH CATTLE. Relief scene in the tomb of Mereruka at Sakkara, Egypt, 27th century B.C.

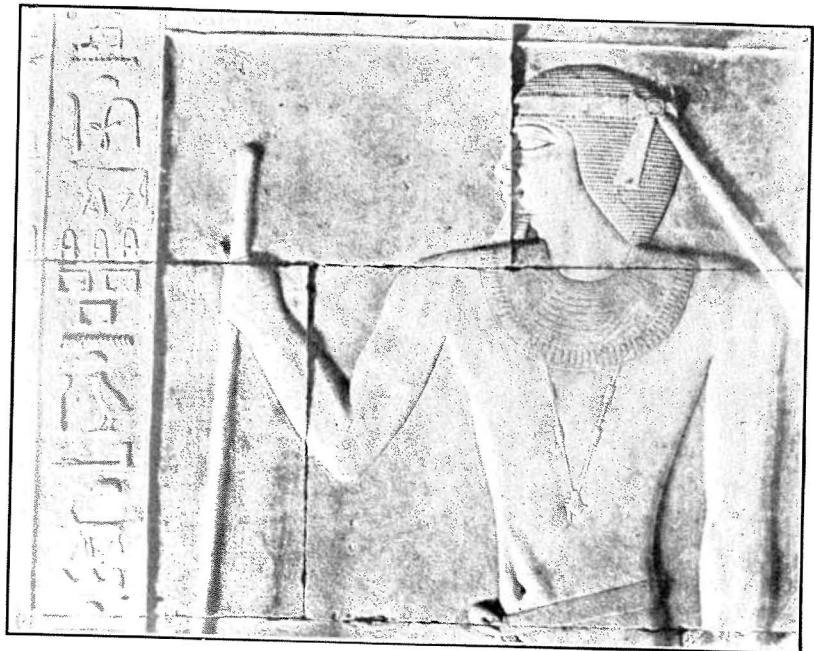


FIG. 27. PORTRAIT OF A GREAT LORD OF THE PYRAMID AGE NAMED KEGEMNI. Accompanied by his titles as "Chief of the Stables of Cattle and Chief of the Stables of the Plateau Antelopes." Relief in his tomb at Sakkara, Egypt, 26th or 27th century B.C.

In the same way, after domesticating varieties of the goose and duck, the Egyptians captured a varied list of wild fowl which they wholly or partially domesticated, although this list did not include our barnyard fowl, which was introduced in the west from India from the seventh century B.C. onward. It will be seen, then, how widely extended and inclusive was the effort of the Egyptians at domestication. They were still continuing the task in historic times, and it went on throughout the third millennium, if not much later.

It is evident from the conditions among their domestic cattle, furthermore, that they had long been engaged in the process of



FIG. 28. BUTCHERING OF SEMI-DOMESTICATED ANTILOPES, SHOWN IN THE TOMB OF KEGEMNI. Compare Fig. 29.

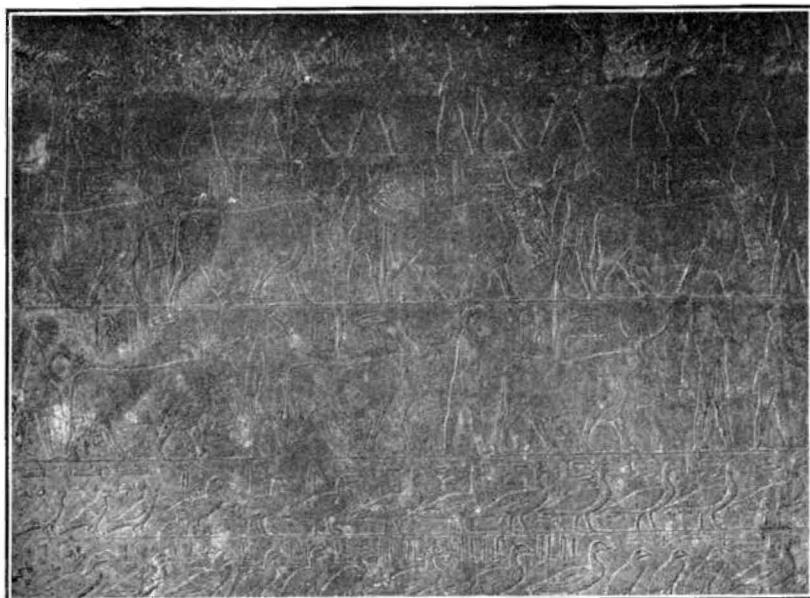


FIG. 29. CATTLE INSPECTION INCLUDING SEMI-DOMESTICATED ANTELOPES ALONG WITH DOMESTICATED CATTLE. As shown in reliefs from the tomb of Manofer, now in the Berlin Museum (27th century B.C.).

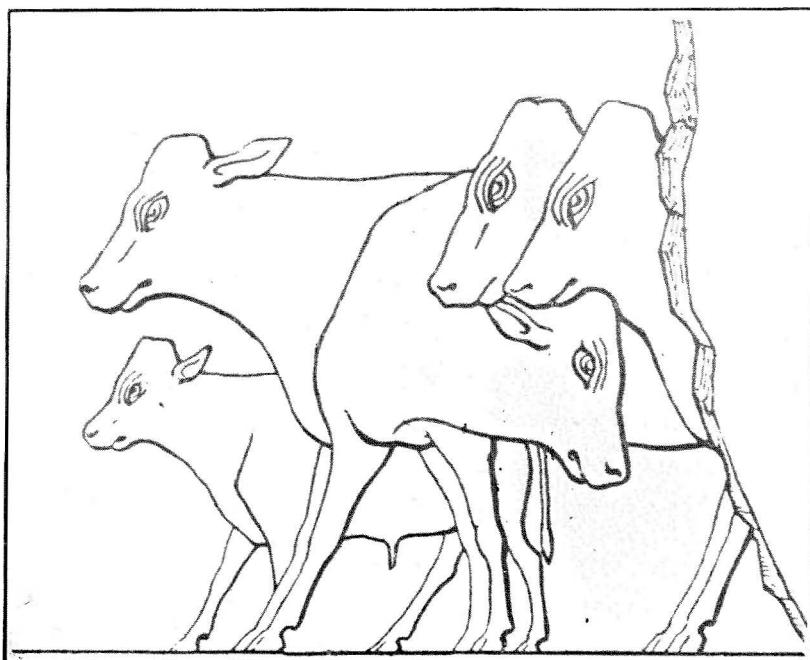


FIG. 30. HORNLESS BREED OF EGYPTIAN CATTLE. From a tomb relief at Gizeh, 29th century B.C.

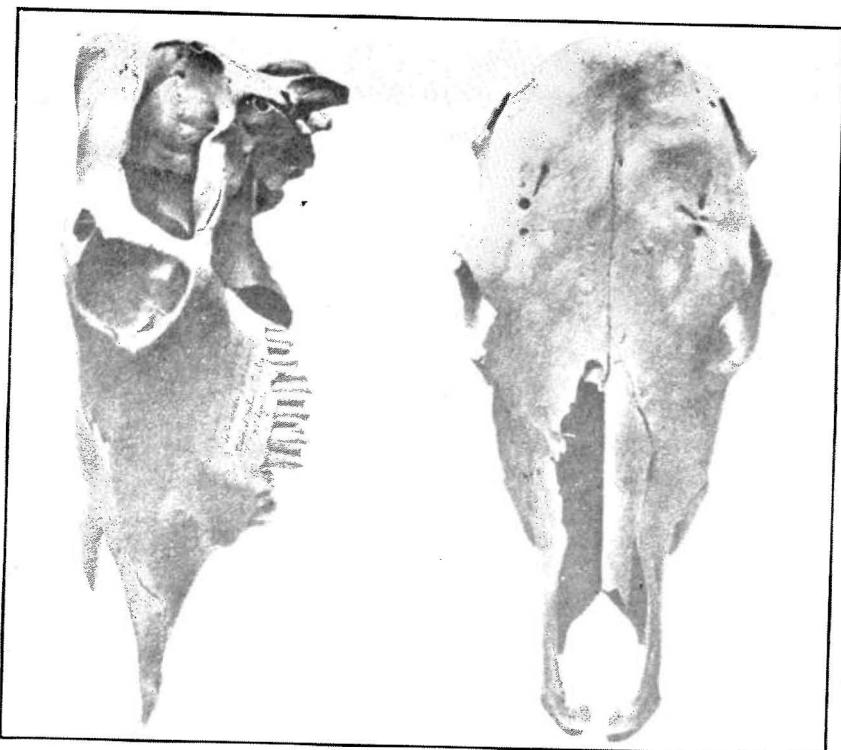


FIG. 31. SKULL OF A HORNLESS BREED OF ANCIENT EGYPTIAN CATTLE. Taken from an XIth Dynasty tomb (2160-2000 B.C.). (After Lortet and Gaillard, "Faune momifiée.")

breeding. For not only had they early developed a short-horn variety out of the long-horn, which was not identical with the Asiatic short-horn (*Bos brachyceros*), but at the same time they also bred a hornless variety of cattle (Fig. 30) (*Bos akeratos*). The actual skulls of this hornless breed have survived (Fig. 31).

A series examined by Lortet led him, like Duerst, to conclude that this hornless breed of cattle was the result of long and persistent selective breeding, very intelligently carried on. In this case we would have here a situation like that which we found in the case of the domesticated grains. Wheat with ages of selective cultivation behind it, has been found in the earliest known graves in the world. Similarly the oldest domesticated herds known to modern science, that is the oldest cattle in the world, would, according to Lortet and Duerst, already include a hornless breed produced by long-continued selective propagation.

On the other hand Professor Charles B. Davenport, director of the Department of Experimental Evolution of the Carnegie Institution, has kindly informed me that "hornlessness in cattle has probably arisen many times as a sport or mutation," and might then be continued and perpetuated by selective breeding. He concludes that the hornless breed of ancient Egypt arose and was continued in this way. In either case intelligently practised cattle-breeding on the part of the Nile dwellers at a very early date is evident.

We can understand therefore, that the production of milk-producing cattle was the result of long-continued and intelligently directed selective breeding, already completed by 3000 B.C. That the milk breed had not yet become wholly accustomed to the artificial abstraction of milk by the hand of man is evident from the fact that in practically all such dairy scenes, the hind legs of the cow have been elaborately tied (Fig. 32). It is perhaps of importance to note also that the calf is kept in the vicinity, and its eagerness for maternal food is restrained by another herdsman while the milking process goes on.

It is thus evident that conditions both in agriculture and cattle breeding in the Nile valley at the earliest stage when they are observable by us, point clearly back to a long antecedent development, beginning far away in the remote ages when the Nile dwellers lived on the lower alluvium, where the remains of their life are still buried.

The domestication of cattle, like that of donkeys, reacted powerfully on agriculture, as it was gradually discerned that the hoe might be replaced by the ox-drawn plow. Nothing shows more clearly the evolution of Egyptian civilization as a Nile valley process, than the unnoticed fact that the plow drawn



FIG. 32. EGYPTIAN HERDSMEN MILKING. Relief scene in the tomb of Ti at Sakkara, 28th century B.C.



FIG. 33. EGYPTIAN PEASANTS PLOWING. From a tomb relief of the 26th-27th century B.C., now in the Louvre in Paris.

by oxen is simply the old prehistoric wooden hoe equipped with necessary modifications. The primitive form of the Egyptian plow is twice shown in the right-hand column of hieroglyphs in the plowing scene in Fig. 33. Now it can be demonstrated that Egyptian writing has preserved for us pictures of primitive and archaic forms of every day implements, which survived thus in the writing long after they had been displaced by improved forms and hence had ceased to be used in real life. Thus the inscription behind the plowman (Fig. 33) twice displays for us a tiny picture of a form of plow enormously older than the one here shown in actual use. It will be seen that the beam of the plow (in the inscription) is very short, and that the handles are almost too small for use. Indeed this oldest form of the Egyptian plow is little more than the hoe out of which it has developed.

The wooden hoe of the Egyptian peasant (Fig. 34) was made up of two pieces: one, the handle, abnormally short; the other, the blade, disproportionately long. With the exception of the tiny handles shown in the archaic plow just examined in the writing, this hoe is identical with the plow.

An old Egyptian drawing of a plow of about 2000 B.C. (Fig. 34) exhibits clearly the origin of the implement. The handle (of the hoe) has been lengthened to become the beam (of the plow) while the handles for the plowman's use have been sec-

ondarily attached at the point of junction of beam and hoe-blade or plow-share. The builder really constructed a wooden hoe with somewhat elongated handle as plow beam, and then afterward attached the plow handles, which do not engage with the beam or the plowshare, as they would do if they were of one construction with them.

These facts make it certain that the evolution of plow culture from hoe culture took place in the Nile valley. Indeed we are here tracing in the gradually developing material basis of life, a process which bears the stamp of the Nile valley, and is unmistakably Nilotic throughout its course.

Here then, so far as we can see, for the first time in the career of man, and at only one point in the fringe of hunting life which encircled the whole Mediterranean, there grew up at its southeast corner (Fig. 2) far back in the fifth millennium before Christ, a community of Stone Age men who had gradually shifted from the hunting life to that of herdsmen and shepherds, plowmen and cultivators of the soil. While it may have required over six thousand acres to support a hunter and his family a very few acres would maintain the grain-raising, cattle-raising Stone Age family, and the population must have greatly increased in numbers and in density. Such a body of population following the agricultural and cattle-breeding life at the southeast corner of the Mediterranean must inevitably have exerted an influence on surrounding populations. Such a diffusion as that which carried Central American culture traits

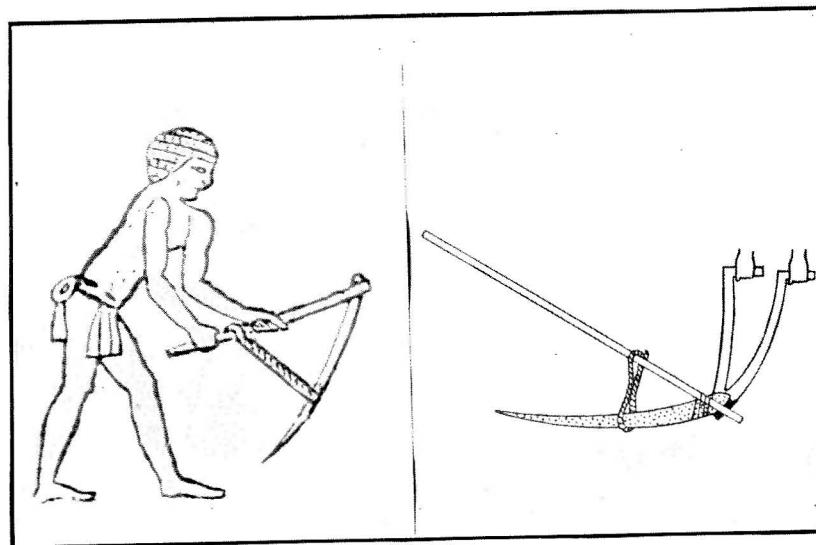


FIG. 34. AN EGYPTIAN WOODEN HOE AND THE WOODEN PLOW WHICH GREW OUT OF IT.

northward and southward until they penetrated far across both North and South America must inevitably have taken place. As to Europe this diffusion was all the easier, because the elevation of the land which made England a part of the neighboring continent, and joined Europe likewise to the mainland of Africa through Italy and Spain—this elevation continued far down into the Neolithic Age, and these land bridges must have been available long after the advances of Egypt just discussed were accomplished (Fig. 2). The same road by which the great African mammals migrated from Africa to Europe was unquestionably still open when the Nile dwellers first began to cultivate fields of grain and breed herds of cattle. It is no accident that the earliest grains of the Swiss Lake Dwellers were barley, emmer and millet, just as in the Nile valley. We have only to look at the dissemination of maize culture in North America from a Central American center to see how easy and inevitable such dispersion is. Moreover, we can actually trace cattle for some distance on the road from Egypt to Europe.

As far back as the middle of the fourth millennium B.C. the Libyans are shown by the Egyptian monuments to have possessed domesticated cattle, sheep and asses (Fig. 24). Such livestock plunder captured by the Egyptians from the Libyans is found in later reliefs also (Fig. 35), which show us large cattle, donkeys, sheep and goats in the possession of a people whose territory stretched far westward along the northern coast of Africa toward Tunis and the region opposite Italy. Thus in remote prehistoric times, Stone Age Europe so long retarded by the ice and cold, began to profit by the progress of the more favored and hence more advanced region at the southeast corner of the Mediterranean. The Neolithic peoples of southern and central Europe were thus able to make the transition from the hunting life to that of settled communities following agriculture and cattle-breeding. This Neolithic life of Europe, preserved to us especially in the Lake Villages of Switzerland and the *terramare* settlements of the Po valley, was unable to advance by itself to the conquest of metal and the invention of writing, and thus to gain civilization. While interesting, it is of minor importance for the theme of these lectures. Entirely dependent upon the eastern Mediterranean, this Neolithic culture of the West never swung into the current of civilized life until after Greek and Phoenician colonization, and finally Roman conquest gradually civilized it. Its chief importance for our theme is its illustration of the earliest great contribution of the Orient to Europe, as cattle and domesticated grain found their

way across the Mediterranean. The position of this contribution in the long continued westward drift of culture will be found suggested later in Fig. 134.

It now seems to be exceedingly probable, if not a demonstrated fact also, that the south and west European communi-

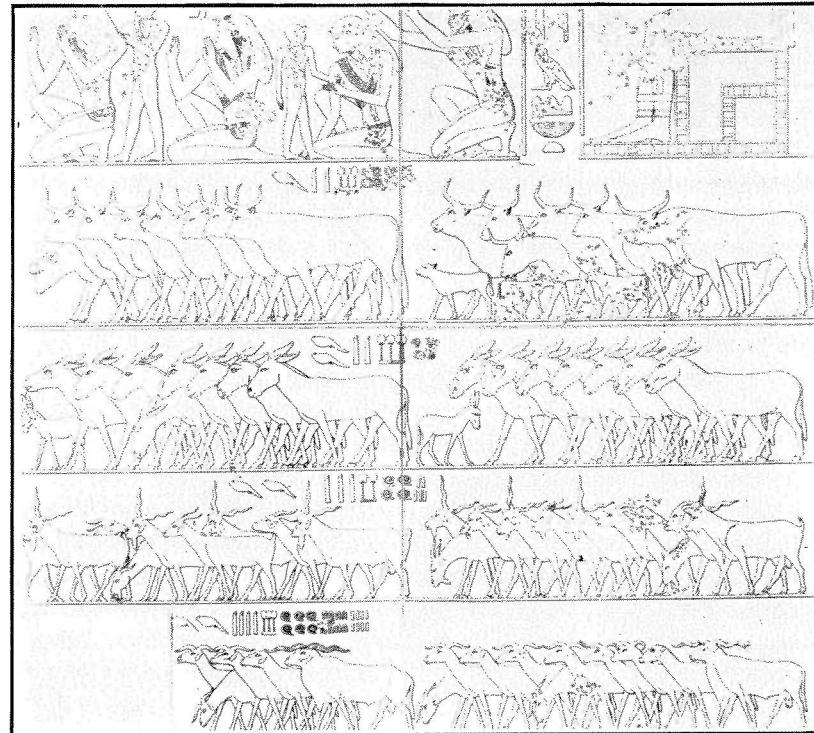


FIG. 35. DOMESTIC ANIMALS OF THE LIBYANS CAPTURED BY THE EGYPTIANS. (28th century B.C.) Compare also Fig. 24. (After Borchardt.)

ties who inaugurated the Neolithic culture of Europe, were of the same race as the prehistoric peoples on the south side of the Mediterranean, or at least as these Egyptians whom we find in the earliest cemeteries. Giving all due consideration to the wide divergence of opinion among the physical anthropologists, it would seem that the studies of Elliot Smith among the largest series of prehistoric Egyptian bodies yet investigated, have demonstrated clearly the identity or close affinity between these prehistoric Egyptians and the south Europeans of the great peninsulas, called by Sergi the Mediterranean race. As Smith has shown in a restoration of a profile from an early pre-dynastic skull (Fig. 36), and as we see also in a late pre-

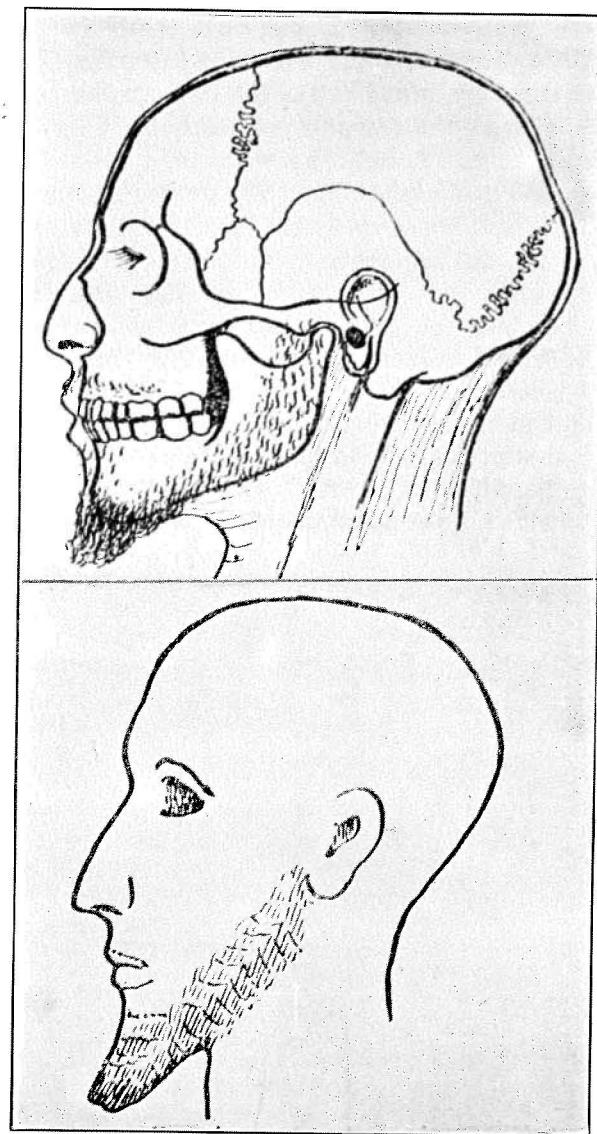


FIG. 36. PROFILE OF A PRE-HISTORIC EGYPTIAN (ABOVE) RESTORED FROM AN EARLY PRE-DYNASTIC SKULL BY DR. ELLIOT SMITH, AND HEAD OF A LATE PRE-DYNASTIC STATUETTE. (The latter after Quibell, "Hierakonpolis.")

dynastic statuette, the prehistoric Egyptians were a narrow-headed, long-faced, dark-haired, and almost certainly dark-eyed race. They were rather low in stature (the men a little under 5 feet 5 inches; the women almost 5 feet), and they were of slender build. They were not negro or negroid, and their kin are to be found in Europe, rather than in Africa.

It must have been after a very long career as a settled agricultural and cattle-raising people, that these dwellers on the Nile alluvium discovered and began to use metal. Unlike the domestication of grain and cattle, the introduction of metal was hardly earlier than the dawn of civilization. We can therefore trace the incoming of metal as we cannot follow the rise of agriculture and cattle-breeding. The graves of our early cemeteries (Fig. 22) disclose to us not merely cultivated grain and domestic cattle, but also metal. For in the very earliest of the predynastic graves we find copper needles with the eye produced by bending the butt around in a hook-eye (Fig. 37). Copper beads and bracelets also show that the earliest use of the metal was chiefly for ornaments. These needles are the earliest implements of metal smelted and wrought by man; for they carry this primitive and limited use of the metal back into the fifth millennium B.C., that is back of 4000 B.C. Man thus began to smelt and use metal about six thousand years ago.

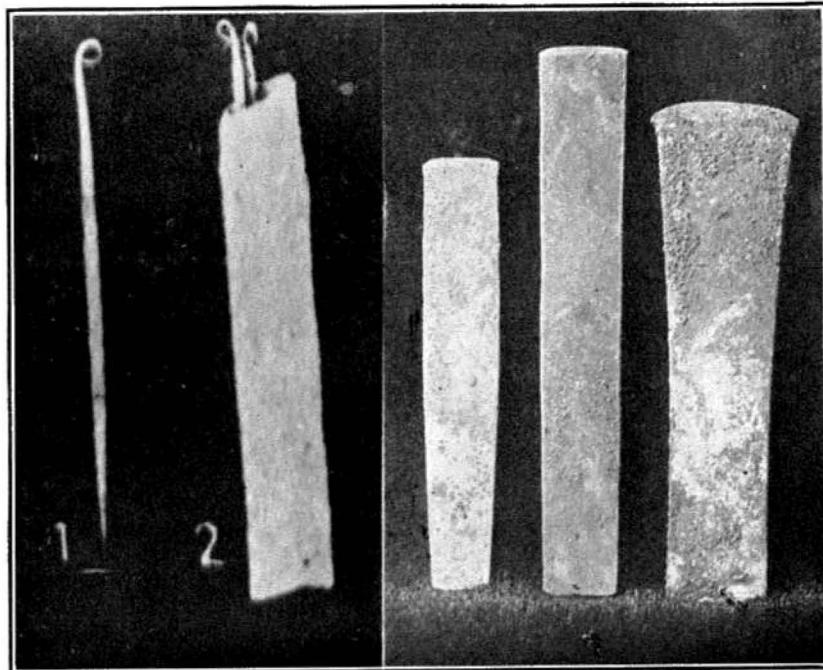


FIG. 37. COPPER NEEDLES WITH HOOK-EYES, THE EARLIEST KNOWN IMPLEMENTS OF METAL. Such needles are found in Egyptian graves dating before 4000 B.C. (After Reisner.)

FIG. 38. THE EARLIEST KNOWN METAL TOOLS: CHISELS OF COPPER FOUND IN PRE-DYNASTIC EGYPTIAN GRAVES ABOUT 35TH CENTURY B.C. (Photo by Petrie.)

Gradually the Nile-dwellers learned that the metal which they were using for ornaments might be made into tools and weapons, giving them a new power over men and nature. With tools and weapons like these (Fig. 38), which appear in the late pre-dynastic graves by the middle of the fourth millennium B.C., when all the world was elsewhere using only stone implements and weapons, the life of man entered upon a new epoch and at the southeastern corner of the Mediterranean a mechanically gifted people began to respond rapidly to the possession of this new source of power. This response of an ingenious people to the possession of metal culminated in the emergence of a united nation, the first great social and administrative structure erected by man, whose organized capacity was, half a millennium later, to be expressed in monumental form in the pyramids of Gizeh.

The process of political unification which went on among the prehistoric petty kingdoms and chieftaincies distributed along the Nile, is only dimly discernible in the scanty monuments surviving from this remote age. We see these early leaders bearing pointed metal weapons in the hunt, for the Nile-dwellers continued their old hunting habits for thousands of years after the rise of civilization. Monuments from the middle of the fourth millennium show us the Nile chieftains still following the chase (Fig. 39). But even such a document as this hunting scene (Fig. 39) also clearly discloses something of the vast social and governmental progress made by the earliest men, a progress which had carried them away from reliance on the chase, toward the possession of a stable food

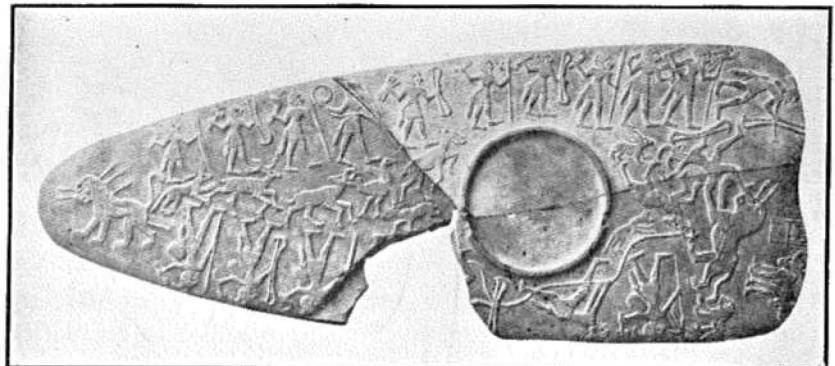


FIG. 39. NILE CHIEFTAINS OF THE MIDDLE OF THE FOURTH MILLENNIUM B.C. ENGAGED IN HUNTING. Depicted in a relief on a slate palette used for grinding face paint. (After Legge in *Proceedings of the Society of Biblical Archaeology*, Vol. XXII.)



FIG. 40. A ROYAL DIGGING CEREMONY OF EARLY DYNASTIC AGE DEPICTED IN A RELIEF ON A CEREMONIAL MACE-HEAD. (From Quibell, "Hierakonpolis.")

supply available to large communities abiding in fixed dwelling places. These hunting chieftains carry standards on which are mounted symbols signifying political divisions—the earliest such symbols known. We recognize in them prehistoric forms some of which are well known to us in later hieroglyphic signs. Thus the fifth hunter in the upper line carries a symbol mean-

ing "the East" in the hieroglyphic of half a millennium later. Each hunter also wears attached to his girdle behind, the tail of a wild animal—a symbol retained in historic times only by the Pharaoh.

One of the most powerful influences toward unity and organized development in a rainless climate like that of Egypt, was the necessity of creating an ever more complicated irrigation system. To maintain such a system, to keep each of its long canals free from obstruction, and to control the supply of water, required the cooperation of large groups of communities, created a consciousness of community of interest and a willingness to submit to a central authority in control of the whole. One of the ancient prehistoric rulers shown in Fig. 40 beside a canal wielding an archaic wooden hoe, is evidently engaged in ceremonially digging up the earth, for which his attendant holds a basket. Such a ceremonial act may well have marked the beginning or dedication of some irrigation canal. Thus the possession of grain fields, and the maintenance of herds which must be pastured, bound great groups of communities to a common system for the support of the whole, which could never have grown up among the hunting chieftains of earlier days.

By the middle of the forty-third century B.C., this system had brought forth a calendar of twelve thirty-day months, and five feast days at the end of the year. This is the calendar which has descended to us through the Romans, though it should be observed that the Egyptian rulers were far too practical to make a calendar which would oblige their people to learn a verse of poetry in order to find out how many days there were in a given month.

THE ORIGINS OF CIVILIZATION

By Professor JAMES HENRY BREASTED

THE UNIVERSITY OF CHICAGO

LECTURE ONE

FROM THE OLD STONE AGE TO THE DAWN OF CIVILIZATION. III

SUCH forces gradually brought about the union of two states on the Nile: in the *north* a kingdom of the delta commonly known as Lower Egypt; and in the *south* a kingdom of the valley above the delta, which we usually call Upper Egypt. The kingdom of Upper Egypt was evidently the older. Side by side the two existed for centuries, each gaining its own traditions, symbols and insignia which survived in historic times for thousands of years. In early dynastic reliefs like Fig. 41, we see

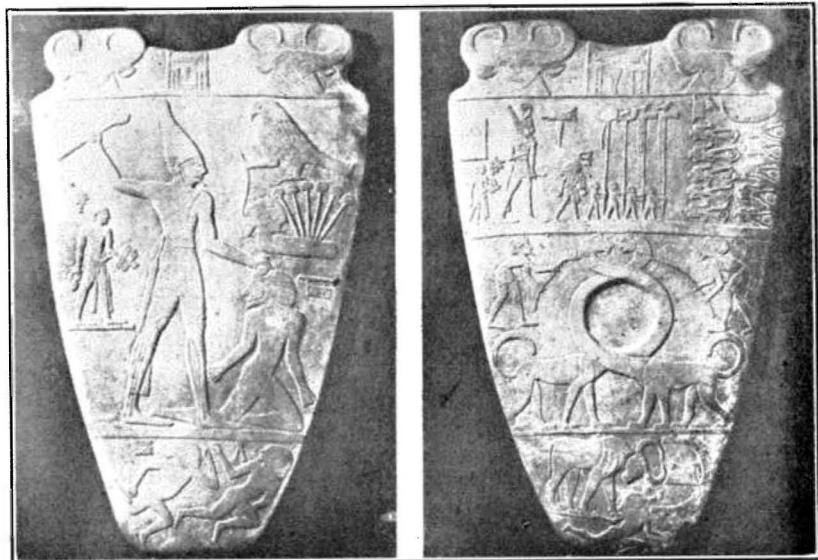


FIG. 41. TRIUMPH OF A PHARAOH AT THE BEGINNING OF THE DYNASTIC AGE. On the left the king wears the white crown of Upper Egypt; on the right (top scene, left end) he wears the spiral-crowned diadem of Lower Egypt. Relief scenes on a magnificent ceremonial palette of slate. (From Quibell, "Hierakonpolis.")

the tall white crown worn by the prehistoric kings of Upper Egypt, and also the curious spiral-crowned red diadem which regularly distinguished the King of Lower Egypt. In a prehistoric struggle which must have gone on for generations, the king of Upper Egypt, he of the tall white crown, conquered his

northern rival of Lower Egypt, him of the curious red crown, and united Egypt under one sovereignty. Thus probably not more than a century after the middle of the fourth millennium B.C., emerged the first great state in history. In commemoration of his double sovereignty over the two prehistoric kingdoms, the Pharaoh, as we may begin to call him, assumed and wore the crowns of both states, as we see this king here doing on two different occasions. It is interesting to find him still wearing the symbol of his hunting ancestry—the tail of a wild animal appended to his girdle behind.

Such monuments as these show us how the prehistoric Egyptian system of picture signs was developing into phonetic writing. The victory of this king over the enemy symbolized by this single adversary whom he is shown dispatching (Fig. 41, right-hand relief), is commemorated in an archaic pictographic group over the head of the captive. The falcon (here with a human arm) is an enormously old symbol of the prehistoric ruler of upper Egypt. Knowing this, we easily read the group; for it will be noticed that the falcon grasps a rope by which he leads a captive suggested by a human head with the rope fastened to the mouth. This head rises out of a stretch of level ground out of which are growing six lotus leaves on tall stems each the symbol for 1000. Just below is a single barbed harpoon, and a small rectangle filled with wavy lines of water, meaning a pool or lake. The meaning of the whole is clear: "The Falcon King has led captive 6,000 men of the Land of the Harpoon Lake." The further process by which these purely picture signs became phonetic, furnishing the earliest known system of phonetic writing, is now fairly clear to us, but space will not permit its discussion here. It should be mentioned, however, that before 3000 B.C. this system of Egyptian writing developed a complete series of consonantal alphabetic signs, and there is now no reason to doubt that the Phoenician alphabet, and hence likewise our own, have descended from the picture writing of Egypt which we have just read. This question will be taken up more fully in discussing the Phoenicians.

It is of importance at this point to remember that the exclusively Nilotc origin of Egyptian writing is easily demonstrable. In view of this fact it is quite inexplicable that there should have been a wide-spread impression that it was of Asiatic origin. In the first place our oldest examples of Egyptian writing are older than the earliest known writing of Asia. Furthermore Egyptian writing is a veritable zoological and botanical garden of fauna and flora unmistakably Nilotc, while it includes also an extensive museum of implements, ap-

pliances, weapons, clothing, adornments, buildings, etc., peculiar to the Nile valley. Only lack of acquaintance with the material background of Egyptian life, and a failure to study carefully the content of the Egyptian sign lists, can account for the totally groundless assertion of the Asiatic origin of Egyptian writing by Hommel and de Morgan, which has unfortunately found its way into many current books. As his writing developed, the Egyptian at the same time devised the earliest known paper, which he succeeded in making from the papyrus reed

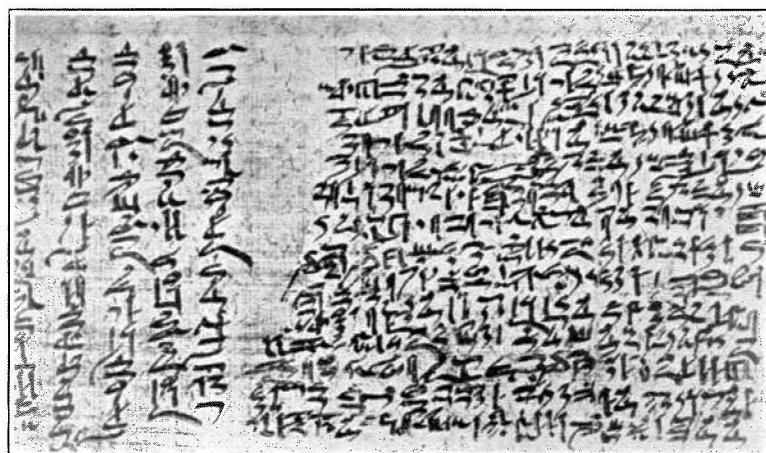


FIG. 42. SPECIMEN OF EGYPTIAN PAPYRUS PAPER, CONTAINING PART OF A TALE WRITTEN NEARLY 2000 B.C. Now in the Berlin Museum.

(*Cyperus papyrus*), a plant which grew very plentifully in the Nile marshes (Fig. 42). It has especial interest for us, because it was the first paper used by Europe, and as we shall see, this paper brought to Europe an alphabet which had grown up out of the system of Egyptian hieroglyphic of which we have just been speaking.

Thus emerged the first great organization of men, efficient in the possession of a system of written records and communication, and stably founded on a basis of agriculture and cattle breeding, prepared to exploit to the full the possession of metal tools. It was now that the kingship proved invaluable in furnishing the powerful organization for mining on a large scale which private initiative could not have furnished. The source of copper was in the Peninsula of Sinai.

Berthelot has remarked²⁰ how interesting it is, that probably at the beginning of the exploitation of these mines of

²⁰ "Sur les mines de cuivre du Sinai," *Comptes rendus de l'Académie des Sciences*, 19 Aug., 1896.



FIG. 44. ONE OF THE EARLY COPPER MINES IN SINAI WORKED BY THE ANCIENT EGYPTIANS. (Photograph by Petrie.)

Sinai, that is over six thousand years ago, by an empiricism the origin of which is easy to conceive, man had already gained the processes for smelting metal, which have been followed ever since even down into our own day. Only recently have the metallurgical chemists succeeded in devising processes more successful and efficient than those which were first devised in Sinai over six thousand years ago.

This remark of Berthelot's justifies us in picturing the experience of some wandering Egyptian back in the fifth millennium B.C. as he banked his fire with pieces of copper ore which happened to be lying about his camp—part of the talus and detritus which encumbers the base of the cliffs in the lonely valleys of Sinai. As these natural fragments were exposed to the fire, the charcoal of the wood blaze, together with the heat, reduced a portion of the ore, and we can easily imagine how the attention of the wanderer would be attracted by a glittering globule of the liberated metal as it rolled out among the ashes.

The new age of mankind born on that memorable day was beginning to enter on its birthright, when centuries later the Egyptian monarchy emerged in the middle of the fourth millennium B.C. The metal, which the first Egyptian who possessed it had gained by accident, was now to be won systematically and on a relatively large scale, as only the sovereign could do in that distant age, when individual initiative was unequal to

the task. In Fig. 44 we see one of the ancient Egyptian mines in Sinai visible high up on the right. Though this particular example is not one of the earliest, these mines of Sinaitic Maghara are the oldest known mines in the world. Below the mine on a slight elevation at the foot of the slope we see the stone huts of the miners. A protective wall extends transversely across the valley. Here lived a little colony of miners. Plentiful evidences of their work are still scattered about the place. Under the floor of the hut they concealed the pottery canteen with which they carried on their rough-and-ready housekeeping, and there Petrie found it in his investigation of the place (Fig. 45). Their copper tools have likewise been found covered by rubbish (Fig. 46). The heavy stone picks which they still employed in getting out the ore, have likewise been found on the spot (Fig. 47).

The interiors of the mines themselves are very instructive. The action of the copper tools on the wall of the drift can still be closely followed and exhaustively examined, even to deter-

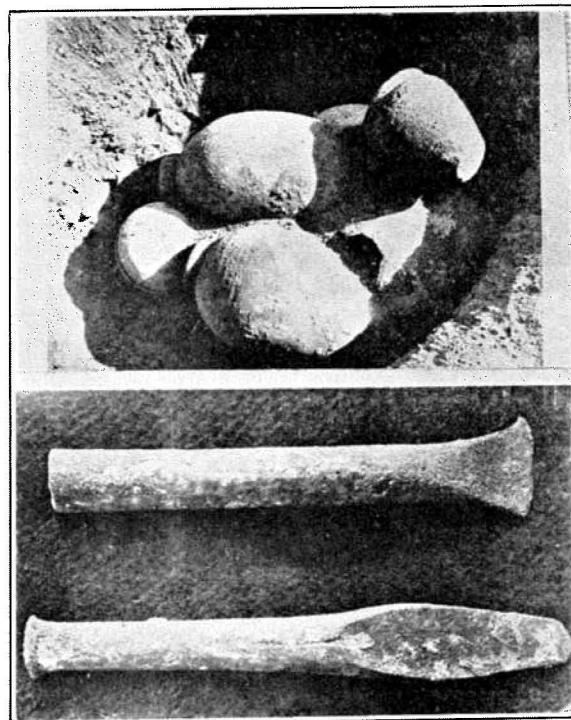


FIG. 45. POTTERY CANTEEN OF ANCIENT EGYPTIAN MINERS. Found buried under the floor of their hut in Sinai. (Maghara; photograph by Petrie.)

FIG. 46. COPPER CHISELS EMPLOYED BY ANCIENT EGYPTIAN MINERS IN SINAI. (Serabit; photograph by Petrie.)

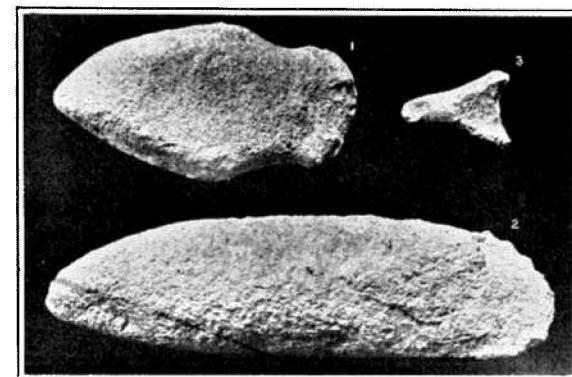


FIG. 47. HEAVY STONE PICKS AND STONE DRILL-HEAD FOUND AT ANCIENT EGYPTIAN COPPER MINES IN SINAI. (Photograph by Petrie.)

mining the width of the chisel edge (Fig. 48). Though the mines are not usually large, and do not commonly exceed five feet in height, Fig. 49 shows a chamber of spacious dimensions. Space does not permit discussing the methods of freeing and taking out the ore; but we may glance at the evidences which disclose the smelting process. It is clear that smelting was often done directly at the mine. Petrie found the heavy stone pounders by means of which the ore was crushed (Fig. 50). Masses of slag have also been uncovered, and in Fig. 51 we see

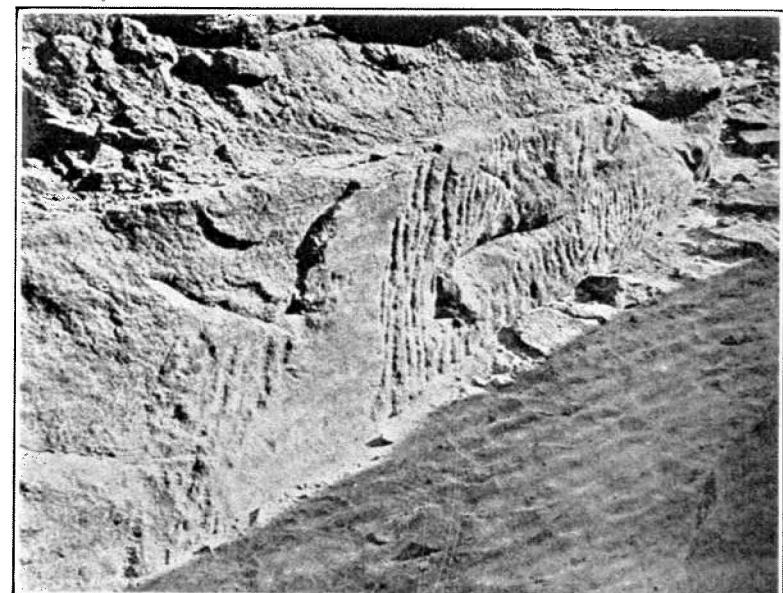


FIG. 48. WALL SHOWING STROKES OF COPPER CHISEL IN ANCIENT EGYPTIAN COPPER MINE IN SINAI. (Maghara; photograph by Petrie.)

a pottery crucible with large nozzle for pouring the molten metal into forms.²¹

The copper-bearing minerals which these earliest miners smelted were chiefly of three kinds: turquoise, containing only about three and a third per cent. of oxide of copper; a hydrosilicate of copper; and finally certain granites impregnated with carbonate and hydrosilicate of copper. These granites are also poor ore, but the hydrosilicate is sometimes very rich in copper.²²

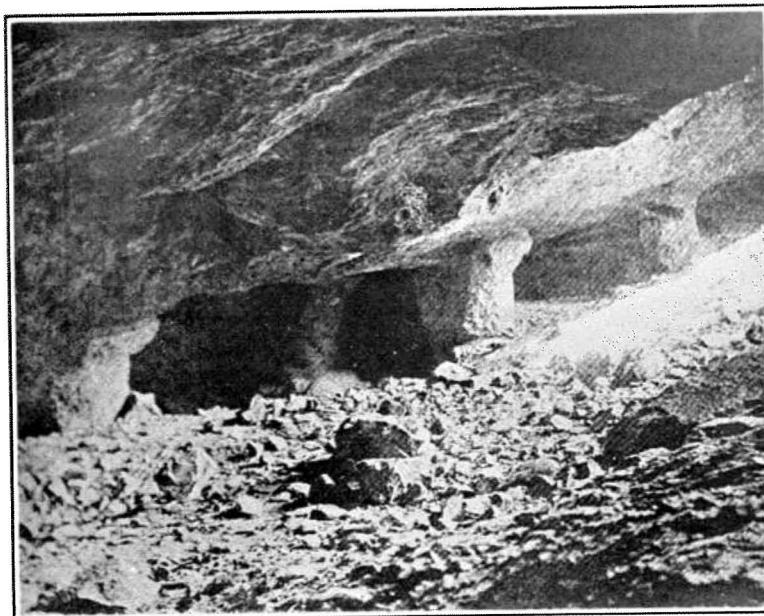


FIG. 49. INTERIOR OF A LARGE COPPER MINE WORKED BY THE ANCIENT EGYPTIANS IN SINAI. (Serabit; photograph by Petrie.)

The decisive importance of these mines in Sinai is evident when we understand that they are definitely dated. For over two thousand years the Pharaohs exploited the Sinai copper regions and have left their records on the rocks around the mines to testify to the fact. These records begin in the thirty-fourth century and continue until the latter part of the twelfth century B.C. It is not a little impressive at the present day to see appearing on the rocks before us the figure of the first ruler of men who has put himself on record as having organized and sent forth his people to bring out of the earth the metallic re-

²¹ The above discussion of the ancient mines of Sinai is much indebted to the text and photographs of Petrie, "Sinai."

²² See Berthelot, *ibid.*

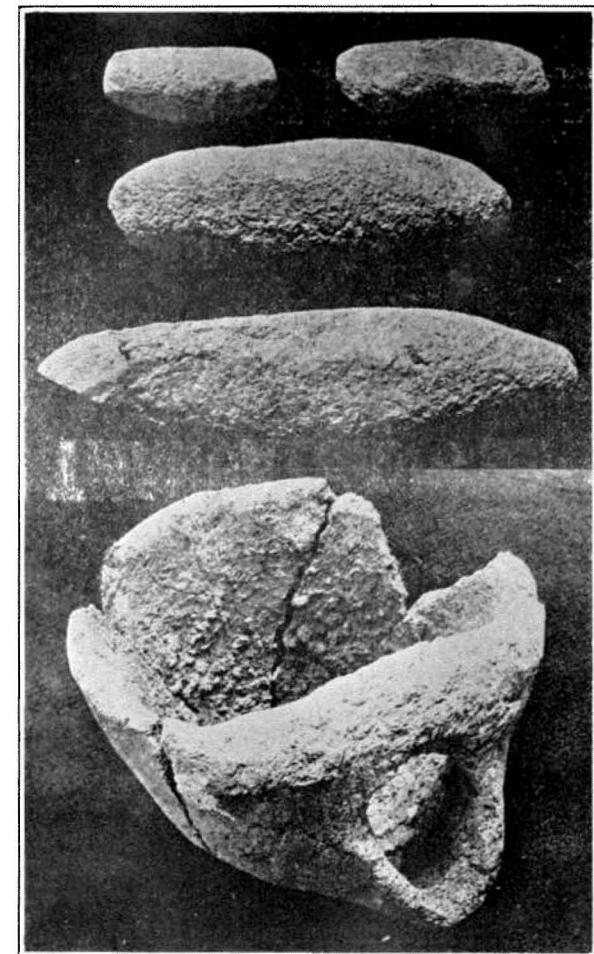


FIG. 50. STONE POUNDERS FOR CRUSHING COPPER ORE USED BY THE ANCIENT EGYPTIANS IN SINAI. (Photograph by Petrie.)

FIG. 51. POTTERY CRUCIBLE WITH NOZZLE FOR POURING MOLTEN COPPER INTO FORMS. Found at the ancient copper mines in Sinai. (Serabit; photograph by Petrie.)

sources without which man could no longer carry on a great state (Fig. 52).

As we approach we are standing in the presence of the earliest known historical monument. Carved with rugged and archaic simplicity, the figure of this earliest royal miner rises before us in heroic proportions. Here is the earliest sovereign to follow economic dictates and to march into a neighboring continent to seize by sole right of might the mineral wealth which his people needed. Depicted in the symbolic ceremony of crushing the Bedwi chief of the district, to signify the Egyptian Pharaoh's possession of the region, this king Semerkhet

thus published to the natives of western Asia his sovereignty over the world's earliest copper mines. He wears here the official crowns, the white and the red, which signify his supremacy over the Two Egypts, a supremacy which he had thus extended over neighboring Asia in the 34th century B.C. Thus the earliest known autocracy, seizing the mineral-bearing regions of Asia which it needed, some 5,300 years ago, began that long career of aggression based on economic grounds, which continuing ever since culminated in the seizure of the mineral wealth of northern France in August, 1914.

This record of Egyptian conquest in metallurgy, let it be noted, consists of inscriptional as well as sculptured elements. The name of the king in Egyptian hieroglyphics of unmistakable Nilotic origin, accompanies his figure, and it is well to remember that this mining record, made after Egypt had known of copper for over half a millennium, is nevertheless several centuries older than the oldest dated piece of copper known in Asia.

This earliest family of sovereigns ruling over a people of several millions was founded about 3400 B.C. by Menes, the first of the Pharaohs. His home was at Thinis, near Abydos in Upper Egypt, below the great bend where the river approaches most nearly to the Red Sea. We call the whole group the First Dynasty, and together with the second group, or second Dynasty, these early dynastic kings of Egypt were



FIG. 52. RELIEF CARVED ON ROCKS AT THE ANCIENT EGYPTIAN COPPER MINES IN SINAT (MAGHARA), IN THE THIRTY-FOURTH CENTURY B.C. It shows the figure of the earliest known mining promoter, King Semer-khet of Egypt. At the left he smites a Bedwi chief of the region, while his other two portraits display him once with the crown of Upper and again with the crown of Lower Egypt. This is the oldest historical monument known, and the earliest such record of a foreign conquest on alien soil. (Photograph by Petrie.)

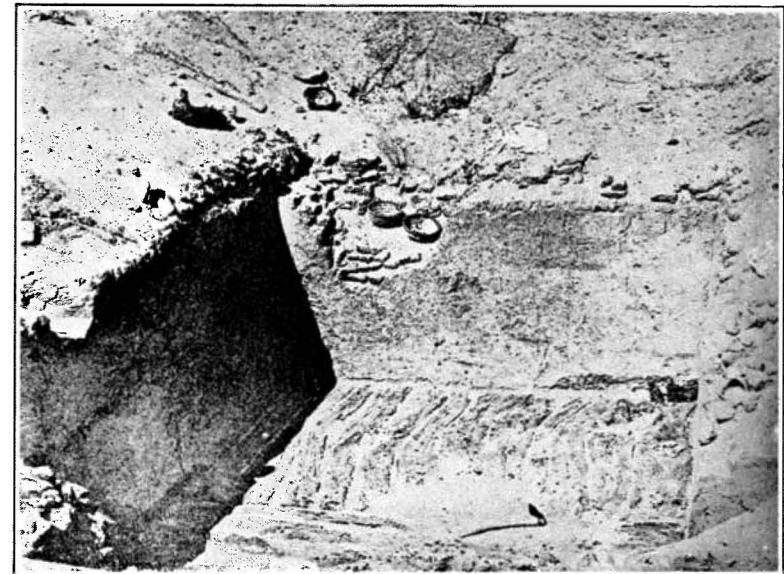


FIG. 54. BRICK-LINED TOMB CHAMBER OF ONE OF THE EARLY DYNASTIC KINGS (ABOUT 3400 TO 3000 B.C.) AT ABYDOS. (Photograph by Petrie.)

buried in the desert behind Abydos, where the wreckage of nine of their tombs still survives (Fig. 54). After Amélineau's unsuccessful and destructive attempt to excavate these

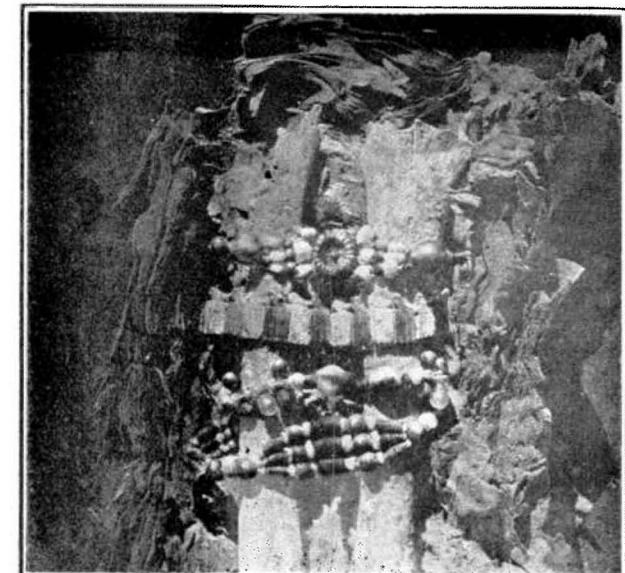


FIG. 55. FOUR BRACELETS OF GOLD AND PRECIOUS STONES, STILL ON THE ARM OF A ROYAL LADY. Found by Petrie in one of the early dynastic tombs of Abydos. (Photograph by Petrie.)

tombs, we owe the rescue of what was left, to Petrie's efforts. He was able to save enough of the palace furniture and other royal equipment placed in these tombs for the use of the royal dead in the hereafter, to disclose to us the remarkable progress of this earliest state in material life, especially in arts, industries and craftsmanship, during the last four centuries of the fourth millennium B.C., that is about 3400 to 3000 B.C.

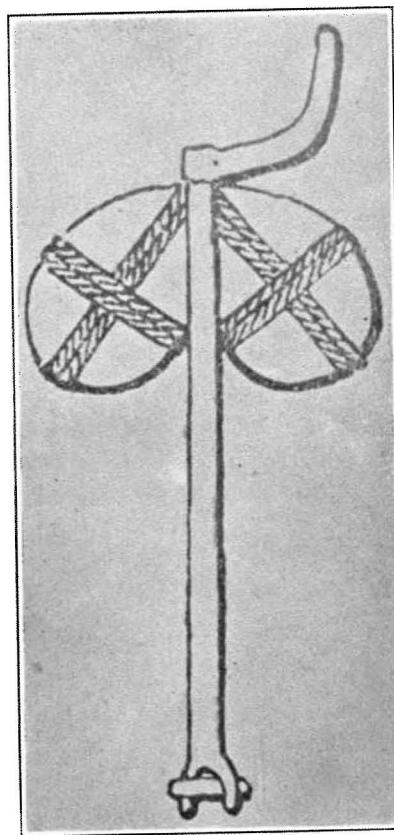


FIG. 56. EGYPTIAN CRANK DRILL INVENTED IN THE EARLY DYNASTIC PERIOD (ABOUT 3400 TO 3000 B.C.), THE EARLIEST KNOWN MACHINE. (Drawn by Borchardt from a hieroglyph.)

The advance in industrial appliances of which the jewelry in Fig. 55 gives evidence, is illustrated by a very important device for drilling out stone vessels, which was invented in the early dynastic period (Fig. 56). It is elaborately drawn for us in hieroglyphic, in which it became the sign for "craftsman." It consists of a vertical shaft with a crank attached at the top, and forked at the base to receive a cutting edge in the form of a sharp stone. Just below the crank are attached two stone

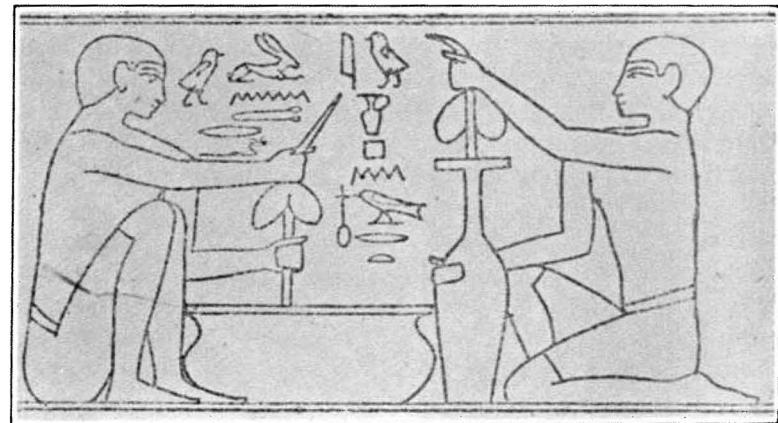


FIG. 57. EGYPTIAN CRAFTSMEN ENGAGED IN DRILLING OUT STONE VESSELS WITH THE CRANK DRILL SEEN IN FIG. 56. The scene is taken from a tomb relief. The hieroglyphs between the two workmen record their conversation. One says: "This is a very beautiful vase." The other responds: "It is indeed." (From de Morgan, "Recherches sur les origines de l'Egypte," I.)

weights, like the two balls of a steam governor. These of course serve as a fly wheel to keep the shaft revolving. Here is the earliest machine which can fairly be called such. It displays the earliest known crank or crank-driven shaft. The result was superb stone vessels and the development of a new and highly refined craft (Fig. 57).

Stimulated perhaps by his rival who was producing such beautiful stone vases, the potter at this time also made a great advance in his ancient art. For ages, since his ancestors of the lower alluvium, who already lay buried many feet below the potter's yard, he had laboriously built up his vessels by hand. But now he perfected what was perhaps at first merely a revolving bench, till it emerged as the familiar potter's wheel, the ancestor of the lathe, upon which his clay vessels were now turned.

Thus before 3000 B.C. Egyptian craftsmen devised two revolving machines, involving the essential principle of the wheel, with a vertical axis; but the wheel as a *burden-bearing device* with a horizontal axis (unless as employed in the pulley block?) did not arise in Egypt. It was first used in Asia. On the basis of these devices, and a long list of metal tools highly specialized, there arose a large group of sharply differentiated crafts, among which was the important art of glaze-making, the forerunner of the first production of glass. All these crafts were carried on by the first great body of *industrial* population known in history. They were in existence before 3000 B.C.

The great African game preserve at the southeast corner of

the Mediterranean, which once supported only detached groups of hunters wandering through the jungle, had become a huge social laboratory, where these Stone Age hunters had been transformed first into plowmen and shepherds and then into handicraftsmen. In the course of this process civilization arose and gained a stable political basis in the thousand years between 4000 and 3000 B.C.

Thus supported upon an economic foundation of agriculture, animal husbandry and manufacturing industries, arose the first great state on the Mediterranean, indeed the first great state in the world, at a time when all the rest of mankind was still living in Stone Age barbarism. Such a stable fabric of organization, under the power of the old falcon chieftain, once ruler only of Upper Egypt, but now sole head of all the Egyptian people, had shifted man from a struggle with exclusively *natural* forces, into a new arena where he must thenceforth contend with *social* forces, and out of his crucible of social struggle were to issue new values of a different order, like social justice, the value of right conduct, and hopes of happiness beyond the grave based upon worthy character—conceptions in which the Nile dwellers were as far in advance of the world about them as they were in their conquest of the material world.

This extraordinary forward movement of man before 3000 B.C. in the vicinity of the junction between the two continents, Africa and Eurasia, could not go on without important effects on the advance of man in Western Asia. It is evident that here too man had been pushing forward since Paleolithic times, and his ultimate progress in the whole region around the eastern end of the Mediterranean and down the Tigris-Euphrates valley was to have a profound influence on the career of man in the Mediterranean and thus upon the course of general human history.

The chronological relations of the cultures on the Nile and the Euphrates have not yet been definitely determined. Just as in the case of Egypt, so with regard to Babylonia, the excessively remote dates once current have been shown to be untenable. They have been given wide currency by de Morgan and others. De Morgan bases his conclusions upon two bodies of evidence. First the chronology once drawn from the written documents; and second his own excavations at Susa, the leading town in the old Elamite country on the east of Babylonia. Dr. King of the British Museum long ago discovered evidence which showed that the chronology drawn from the written documents which dated King Sargon of Akkad in the thirty-eighth century B.C. was impossible. De Morgan's distinguished

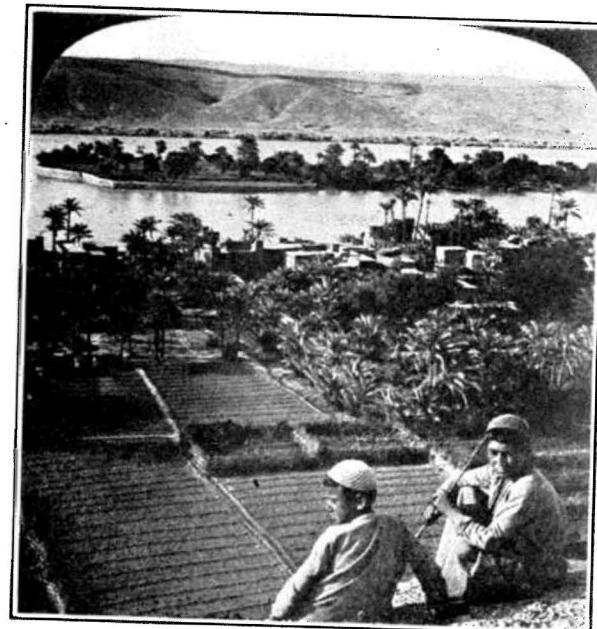


FIG. 60. THE RIVER TERRACES OF THE EUPHRATES, LOOKING EASTWARD ACROSS THE RIVER. About two hundred and fifty miles northwest of Babylon. (Copyright by Underwood & Underwood.)

countryman, Thureau-Dangin, has only in the last few months published a conclusive reconstruction, leaving nothing to be desired in its finality—a reconstruction which places Sargon well this side of 2800 and our earliest written documents of Babylonia hardly earlier than the thirty-first century B.C.

As to de Morgan's earliest periods at Susa, he dates them by their relative depth, that is by the amount of accumulated rubbish over them. Such rubbish produced by the detrition or violent destruction of sun-dried brick buildings, will of course accumulate at a rate variable from site to site and country to country, depending on a wide range of height of the buildings, widely differing thickness of the walls, the varying rapidity of detrition caused by the differing amount of rainfall and the uncertain number of the successive violent destructions. Following de Morgan, R. Pumelly has made similar calculations for the age of the lower strata in his excavations of the ancient city of Anau in Turkestan. Among other data as a basis, he took the very slow accumulation of such rubbish in Egypt, without taking into consideration the difference in rainfall (Egypt having practically none), the difference in height of buildings and thickness of walls, and the politically sheltered situation of Upper Egyptian cities which exposed them to less

frequent destruction than the cities of Asia.²³ Such calculations have no value.

The development of civilized man on the lower Euphrates had undoubtedly been going on for ages before the date of his earliest surviving written documents (thirty-first century B.C.), but the age of that development has yet to be established; for unfortunately the prehistoric stages of Babylonian culture have not yet been recovered.

The river terraces of the Euphrates, such as we see in Fig. 60 overlooking a beautiful island, have not been investigated geologically, paleontologically or archeologically at all. It is evident that man dwelt between the Euphrates and the Mediterranean in Paleolithic times. His remains and his stone implements may therefore lie under and along these Euphrates terraces as they do along the Nile. They have indeed been found in Palestine and along the Phoenician coast, in caves, so stratified as to leave no doubt of their Paleolithic origin. From these early stages until the earliest written documents on the Babylonian alluvium (about thirty-first century B.C.), we have no evidence for the course of the development in western Asia.

It is, however, already perfectly clear that while the Nile valley made the earlier advance, and was the earliest home of civilization, there was reciprocal influence between the two early cultures on the Nile and the Euphrates. Thus the mace

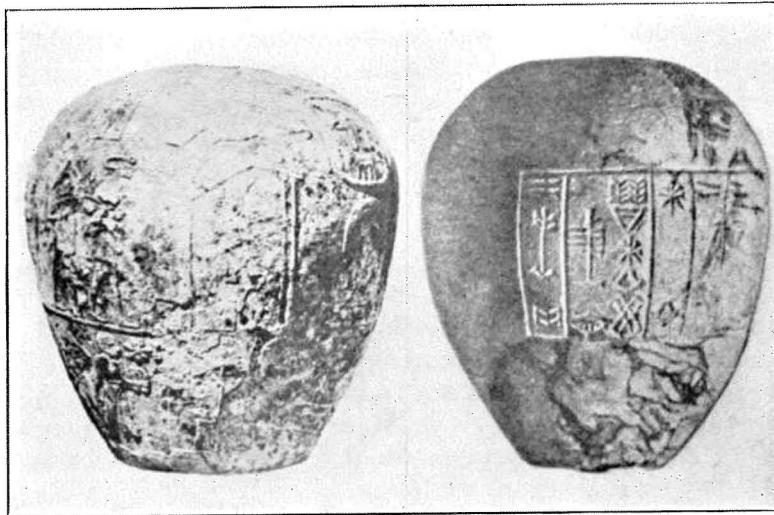


FIG. 61. EGYPTIAN AND BABYLONIAN MACE-HEADS OF THE SAME FORM.

²³ It may be added that Dr. Hubert Schmidt, the able archeologist attached to the Anau excavations, dated the oldest remains found there at about 2000 B.C.



FIG. 62. EGYPTIAN AND BABYLONIAN CYLINDER SEALS OF THE SAME FORM.

head which we find in Egypt far back in the fourth millennium B.C. is also found along the Euphrates many centuries later (Fig. 61). Similarly the cylinder seal employed for sealing clay is found on the Nile centuries earlier than our earliest Babylonian example of it (Fig. 62). The decorative arrangement of balanced animal figures (Fig. 63), especially with a human figure in the middle, is found on the Nile well back

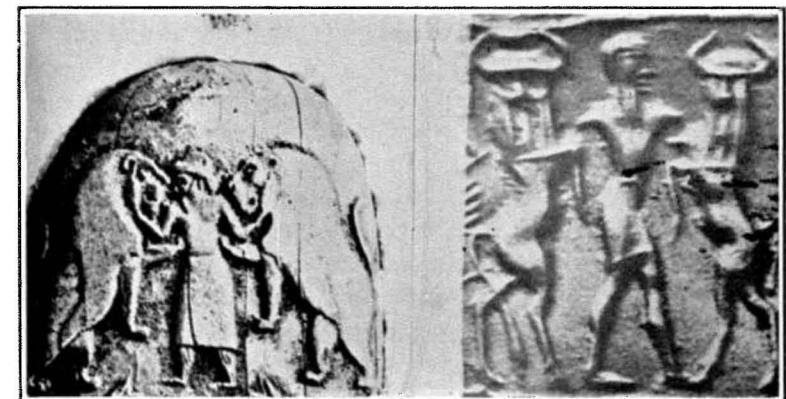


FIG. 63. EGYPTIAN AND BABYLONIAN DECORATIVE DESIGNS. Made up of animal figures balanced antithetically on either side of a human figure.

toward 4000 B.C., and our earliest examples in Babylonia cannot be dated earlier than the thirty-second century B.C. In such matters it should be remembered, however, that an inferior civilization often makes contributions to a superior culture. We have only to remember the source of tobacco, maize, potatoes and the like to illustrate this fact. There will, therefore, have been mutual exchange between the Nile and the Euphrates at a very remote date, and some of these parallels here exhibited may be examples of such mutual interchange.

This process created a great Egypto-Babylonian culture nucleus on both sides of the inter-continental bridge connecting Africa and Eurasia. It brought forth the earliest civilization in the thousand years between 4000 and 3000 B.C., while all the rest of the world continued in Stone Age barbarism or savagery. Then after 3000 B.C. began the diffusion of civilization from the Egypto-Babylonian culture center. The best illustration of what then took place is furnished by our own New World. In only two places on the globe have men advanced unaided from Stone Age barbarism to the possession of agriculture, metal and writing. One of these centers is that which we have been studying here in the Old World; the other is here in the New World.²⁴ Just as the Egypto-Babylonian culture center grew up at the junction between the two continents, Africa and Eurasia, as the oldest and the original center of civilization in the Old World, so here in the New World the oldest and original center of civilization likewise developed along and on each side of the inter-continental bridge. The far-reaching labors of a great group of Americanists have shown clearly that from this culture center in the inter-continental region of the Western Hemisphere a process of diffusion of civilization went on northward and southward into the two continents of the New World, and that process was still going on when the period of discovery and colonization began. That which we accept as a matter of course as we study the New World center, was obviously going on for thousands of years around the Old World center, although a provincially minded classicism has blinded the world to the facts. It remains for us in the next lecture, therefore, to follow the lines of culture diffusion, diverging from the Egypto-Babylonian group and stimulating Europe and inner Asia to rise from Stone Age barbarism to civilization.

²⁴ See the present writer's article, "The Place of the Near Orient in the Career of Man, and the Task of the American Orientalist" (presidential address before the American Oriental Society, in *Journ. of the Am. Or. Soc.*, June, 1919).

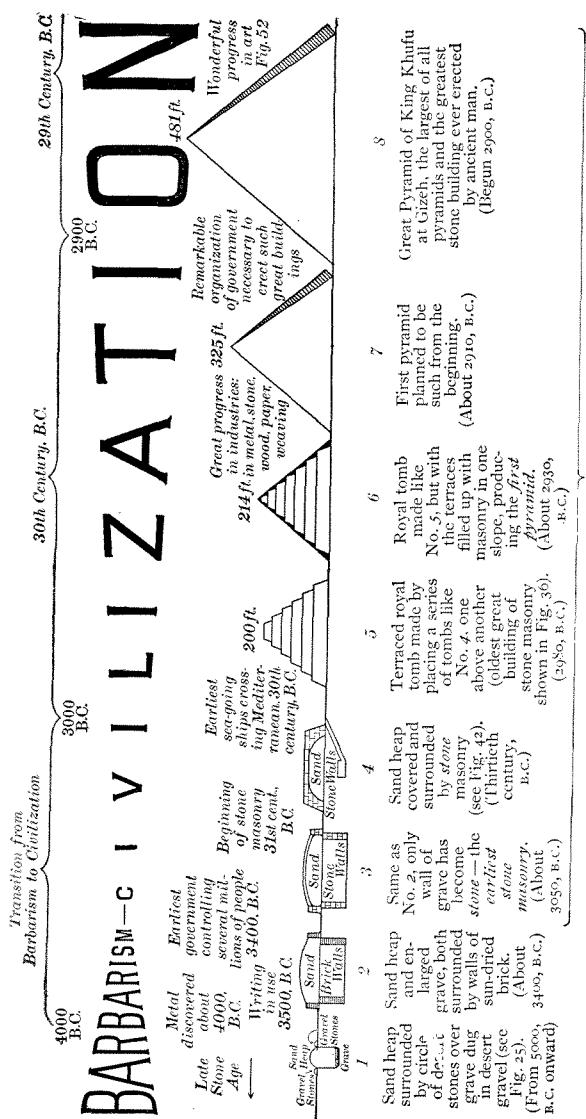


Fig. 65. DIAGRAM SHOWING THE EVOLUTION OF THE EGYPTIAN TOMB FROM THE SAND-HEAP TO THE PYRAMID. From the author's "Ancient Times," by permission of Ginn & Co.)

The body of the early Egyptian peasant lay at the bottom of a grave above which was a low heap of sand surrounded by a circle of rough desert stones to keep the sand in place. No. 1, above, shows this grave, cut down through the middle to expose the inside with the sand heap above it. In nos. 2, 3 and 4 we see the later tombs, also cut down through to expose the inside. They show how the circle of stones around the sand heap was slowly improved till it became real walls, first of brick (no. 2) and then of stone masonry (no. 3) enveloping the whole tomb, with the old sand heap still in the inside. Tombs like no. 4 were then placed one above the other, producing a tapering terraced building (no. 5) which was soon improved until it became a pyramid (no. 6). Thus the sand heap and its circle of stones were the germ out of which the mighty pyramids grew in the course of fifteen or twenty centuries. Notice how this wonderful growth in the art of building began with the sand heap in the barbarism of the Late Stone Age and thus carries us over from barbarism to civilization in the thousand years from 4000 to 3000 B.C. This great art of building was itself one of the things which marked the entrance upon civilization, and architecture passed from the earliest example of stone masonry to the Great Pyramid in only one hundred and fifty years. But incensing civilization was not marked only by progress in the art of building. The remarks inserted above, over the tombs and pyramids, suggest to us some of the other important achievements which helped to bring in and develop civilization, like the discovery of metal and the invention of writing, followed by the earliest government of a large population, the earliest seagoing ships, great progress in industries, and a remarkable development in art. We now see how the pyramids and their predecessors stand like milestones marking the long road by which man passed from barbarism to a highly developed civilization.

THE ORIGINS OF CIVILIZATION

By Professor JAMES HENRY BREASTED

THE UNIVERSITY OF CHICAGO

LECTURE TWO

THE EARLIEST CIVILIZATION AND ITS TRANSITION TO EUROPE

We have seen how the Stone Age hunters of the Nile gradually gained agriculture, domestic animals, metal, writing and industries, and leaving behind the men of the Mediterranean world elsewhere, in the thousand years between 4000 and 3000 B.C. transformed their northeast African game preserve into the first great state, regulated and controlled by a highly organized administration. This progress and especially its culmination in the thirtieth century B.C. is graphically visualized in the diagram in Fig. 65.

No. 1 at the extreme left end represents the pit grave, the only type of burial known until nearly 4000 B.C., which we saw in the first discussion. Surmounted by a low mound of sand, with perhaps a circle of stones around it, this earliest burial was the germ of the pyramid of stone masonry. We can trace the development from stage to stage—a development slow and gradual as civilization arose between 4000 and 3000 B.C., but quickening with surprising swiftness after passing 3000, that is during the thirtieth century, between 3000 and 2900 B.C. Hardly more than a generation before this thirtieth century the first example of hewn stone masonry was laid, and in the generation after this thirtieth century the Great Pyramid of Gizeh was built. With amazingly accelerated development the Egyptian passed from the earliest example of stone masonry just before 3000 B.C. to the Great Pyramid just after 2900. The great-grandfathers built the first stone masonry wall a generation or so before 3000 B.C., and the great-grandsons erected the Great Pyramid of Gizeh, within a generation after 2900. It will be seen that this development falls chiefly in the century between 3000 and 2900 B.C., that is the thirtieth cen-

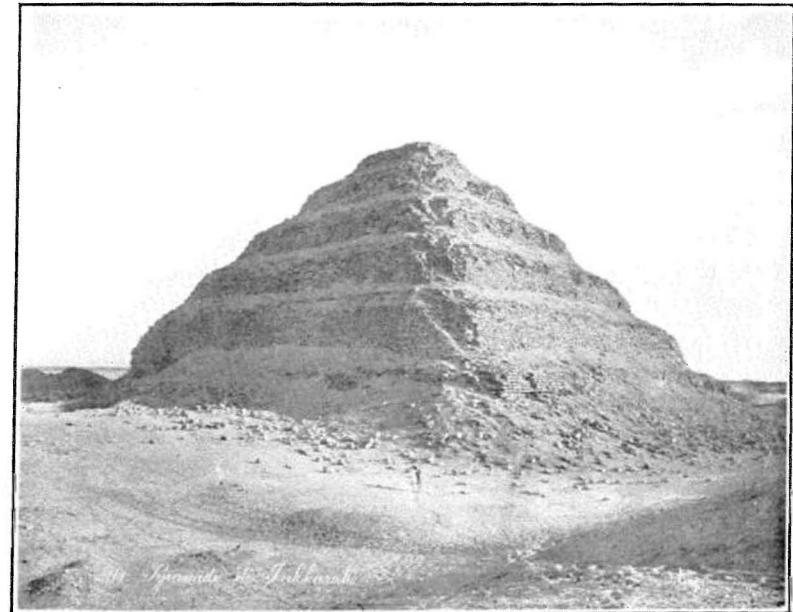


FIG. 66. TERRACED TOMB STRUCTURE OF PHARAOH ZOSER AT SAKKARA, EGYPT. The oldest known superstructure of stone,—built by the architect Imhotep (30th century B.C.).

tury B.C., which for this reason occupies more space in the diagram than the thousand years which precede it. No century in the history of man, except the nineteenth century of our era, has witnessed as rapid an expansion of man's control of material forces as the thirtieth century B.C.

It is therefore of great interest to contemplate the most revolutionary monument of that revolutionary century, the earliest stone building in existence (Fig. 66). This monument marks definitely the transition from sun-dried brick to stone masonry. It was erected as the tomb of King Zoser of the Third Dynasty, by his chief physician and architect Imhotep. This great man, the first builder of monumental architecture in stone, is little known, his fame having been rather groundlessly shifted to King Solomon by our friends, the modern Free Masons. Nevertheless we should not forget that he was the first builder to put up a great superstructure of stone 200 feet high, which still survives as the earliest stone building in existence. Imhotep's fame as a physician has eclipsed his reputation as an architect. He became the Asclepias of the Greeks, the Æsculapius of the Romans, and thus passed into the great company of the ancient gods.

The vast cemetery buildings which followed Imhotep's introduction of stone masonry superstructures reveal to us the first great civilized age of human history, an age to which these structures have given their name, so that it is commonly called the Pyramid Age. It lasted nearly 500 years from a little after 3000 to a little after 2500 B.C. The monuments and cemetery buildings of Gizeh are the monumental expression of the capacity of the first great state in human history.

They suggest a vista never to be forgotten. Out along the desert margin (Fig. 67) is many a grave of the prehistoric Egyptian peasant. The low sand or gravel heap, which once marked it, is the lineal ancestor of the vast monuments of Gizeh, the most tremendous feat of engineering ever achieved by ancient man. What a development is here! Not merely a development in the mechanical arts, which beginning with the sand heap have at last achieved the pyramid, but also a development in the organization of government and society, which slowly advancing in the thousand years or more which lie between the sand heap and the pyramid, has gradually passed from the feeble initiative and limited powers of the individual to the elaborate capacities of a highly organized state, so efficient that it is able with unerring precision to concentrate all



FIG. 67. THE CEMETERY OF GIZEH SEEN FROM AN AEROPLANE. These pyramids are the tombs of the kings and royal ladies of the Fourth Dynasty (about 2900 to 2750 B.C.). They are surrounded by the massive rectangular masonry tombs or "mastabas" of the nobles and officials of the same period. (Copyright by Moussault, N.Y.)

its vast resources of wealth and labor and mechanical skill upon one supreme achievement never later to be surpassed.

The Great Pyramid of Gizeh (Fig. 68) is the most impressive surviving witness to the final emergence of organized man from prehistoric chaos and local conflict, for it discloses him to us as he comes for the first time completely under the power of a far-reaching and comprehensive centralization effected by one all-controlling sovereign hand. Not the least remarkable aspect of this State is the sovereign's confidence in its efficiency. Here is a tomb containing 2,300,000 blocks of limestone, each weighing about two and a half tons, the assembling and erection of which in this building required the labor of one hundred



FIG. 68. THE GREAT PYRAMID OF GIZEH, THE TOMB OF THE PHARAOH KHUFU (CHEOPS), BUILT IN THE TWENTY-NINTH CENTURY B.C. It is the largest stone superstructure ever erected whether in ancient or (except recently) in modern times.

thousand men for some twenty years. Consider the daring imagination which could look out over this plateau, when it stood bare and empty, before its occupation by this building, and measuring off a square containing thirteen acres dared to begin covering it with a pile of stone masonry nearly 500 feet high. What must have been the mental quality of a man whose great-grandfathers had put together the first piece of stone masonry, and whose grandfathers had put up the first stone

superstructure—what must have been the mental quality of a ruler who dared to plan and undertake a tomb of such colossal proportions that no such structure ever later attempted has approached it in size or in quality of workmanship! Such considerations give us an impressive measure of the Pharaoh's confidence in the efficiency of his administrative machine.

He must likewise have had great confidence in the ability of his builders to meet the difficult problems which at once confronted them as they mounted the Gizeh plateau and began laying out the ground plan of the vast royal tomb which they were called upon to erect. One finds it difficult to imagine the feelings of these earliest architects, the great-grandsons of the men who had laid the first stone masonry, as they paced off the preliminary plan and found an elevation in the surface of the desert which prevented them from sighting diagonally from corner to corner and applying directly a well-known old Egyptian method of erecting an accurate perpendicular by means of measuring off a hypotenuse.

It is evident, however, that the Egyptian engineers early learned to carry a straight line over elevations of the earth's surface, or a plane around the bends of the Nile. In his endeavor to record the varying Nile levels in all latitudes the Egyptian engineer was confronted by nice problems in surveying even more exacting than those which he met in the Great Pyramid. A study of the surviving nilometers has disclosed the fact²⁵ that their zero points, always well below lowest water, are all in one plane. This plane inclines as does the flood slope, from south to north. The Pharaoh's engineers succeeded in carrying the line in the same sloping plane, around innumerable bends in the river for some seven hundred miles from the sea to the First Cataract. It is not surprising in view of the difficulty of the feat, accomplished as it necessarily was with primitive instruments about which we know nothing—it is not surprising under these circumstances, that although they kept their line in one plane, they did not succeed in establishing the slope of their line exactly parallel with the flood slope. Later, however, when they extended this line up river they succeeded in carrying it very closely parallel with the flood slope for some two hundred miles further southward to the Second Cataract.

The builders of the Great Pyramid were therefore already in possession of the methods which enabled the Pharaoh's engineers to lay out a seven-hundred mile line of nilometers in one plane. The sockets cut into the limestone surface of the desert

²⁵ L. Borchardt, "Nilmesser und Nilstandsmarken."

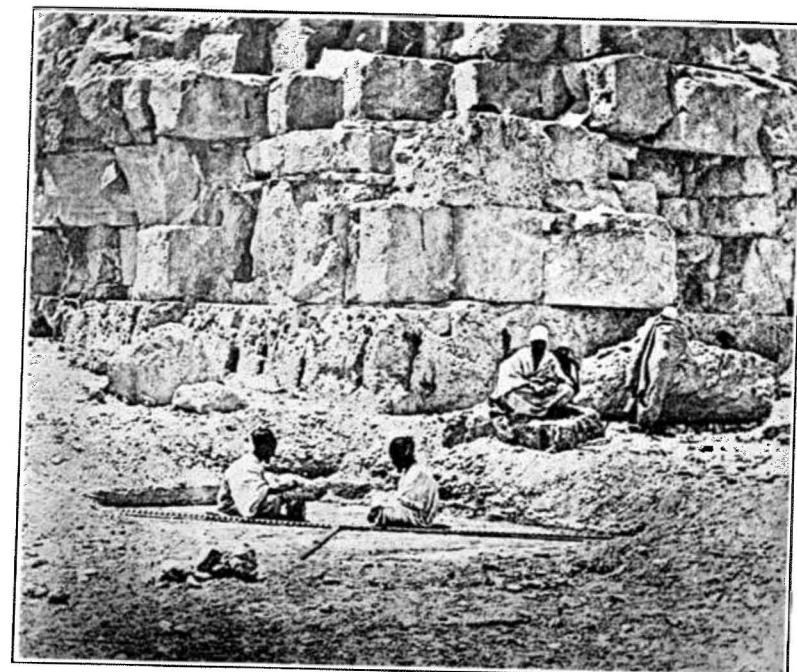


FIG. 69. RECTANGULAR SOCKET CUT IN THE NATIVE ROCK UNDERLYING THE GREAT PYRAMID. In this socket the northeast corner-stone of the building was laid; it was carried off by the Moslems.

plateau in which the cornerstones of the Great Pyramid were laid, still survive (Fig. 69), though the cornerstones themselves have been quarried out by Moslem vandals. These sockets enabled Petrie to establish the length of the sides as 755 feet. The maximum error he found to be .63 of an inch, that is less than one fourteen-thousandth of the total length of the side. The error of angle at the corners he found to be 12" of a degree, that is one twenty-seven-thousandth of the right angle which the architect had laid out at the corner.

It is not a little interesting to follow the methods by which an agricultural people in a few generations developed the power to manipulate such vast masses of architectural materials as the Pharaoh's architects were then called upon to rear nearly 500 feet above this ground plan. The ruins of other pyramids and a pyramid left in an unfinished state at Gizeh have revealed much of the process of construction. Sun-dried brick ramps which were built higher as the pyramid rose, furnished an inclined plane up which the stone blocks were dragged by main strength on wooden sledges. Just how each block was shifted from the sledge to its particular place in the structure is still

uncertain; for the description of the device for this purpose left us by Herodotus is not clear. The indications now are that the pulley-block was already available, but it is unlikely that its ability to multiply power was understood. After the completion of the building the ramps were taken down (Fig. 70).

The most remarkable feat of engineering involved in the erection of the Great Pyramid is probably the construction chambers rising in a series over the sepulcher chamber (Fig. 71). We have here a series of five roofs, the lowest built of granite blocks about twenty-seven feet long, six feet high and over four feet thick. They weigh some fifty-four tons each. After being quarried at the First Cataract these heavy blocks were brought six hundred miles down the river, dragged up to the plateau and then up the brick ramps to a level perhaps two hundred feet above the pavement, where they were so laid that they might protect the burial chamber from being crushed in by the weight of more than two hundred vertical feet of masonry rising above it. The principle which the pyramid engineers seem to have had in mind, was a mistaken one. They seem to have thought that if the topmost granite roof gave way, it was a good thing to have another ready just below it. The series of granite roofs is therefore of purely contingent value. They are crowned however, by a wiser construction of enormous limestone beams, an arch in principle but in appearance a peak roof. These vast

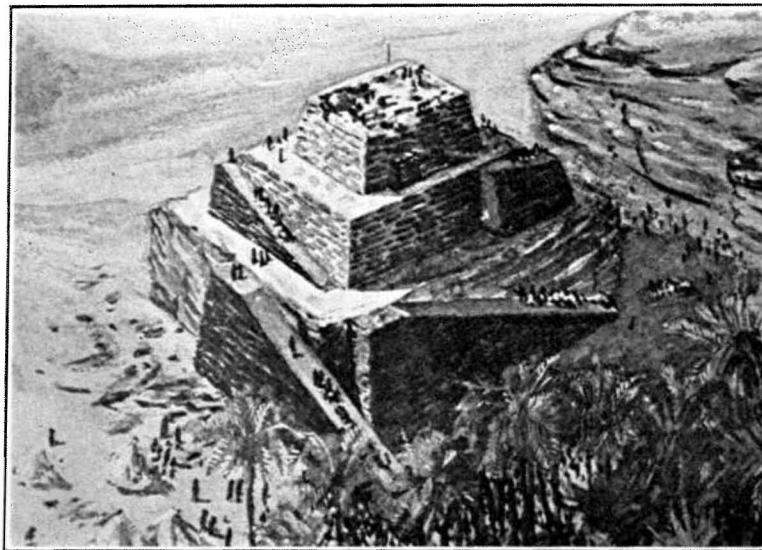


FIG. 70. UNFINISHED PYRAMID AT GIZEH, SHOWING SUN-DRIED BRICK RAMPS FOR CARRYING UP BUILDING MATERIAL. (Restored after Hoelscher.)

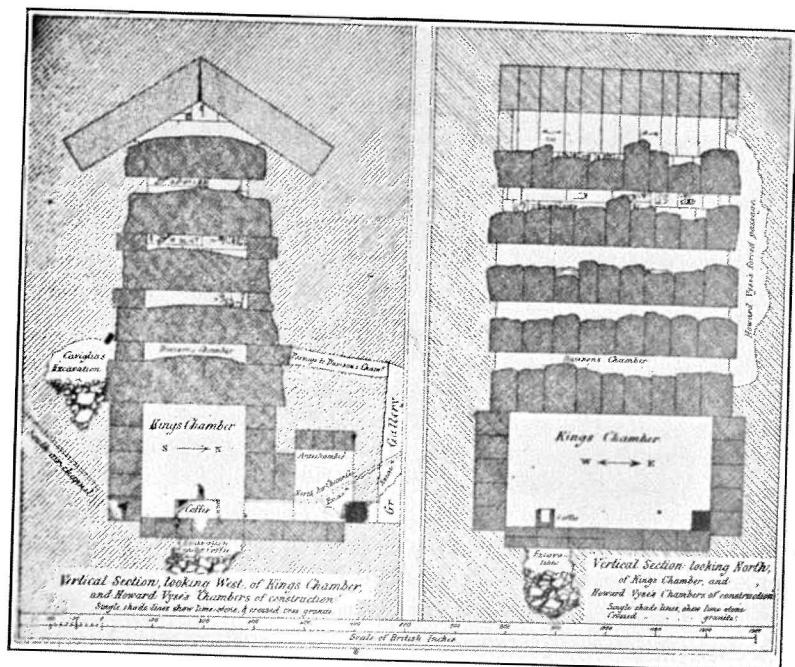


FIG. 71. SEPULCHRE CHAMBER IN THE GREAT PYRAMID OF GIZEH. Showing five precautionary construction chambers above it intended to carry the vast burden of the overlying masonry.

beams of limestone receive the colossal burden on their peak, and by their sideward thrust transfer it to the core masonry of the pyramid on each side of the sepulcher chamber, and thus save the roof of the latter from being crushed in. The effectiveness of the structure is strikingly brought out by the fact that although the beams of the horizontal granite roof immediately over the burial chamber have been broken short off entirely across the chamber by an ancient earthquake, nevertheless the contiguous ends of the beams on each side of the fracture have hardly settled perceptibly.

The ponderous mechanics of which the pyramid engineers were master is impressively illustrated by the enormous mass of stone chips produced by the army of stone-cutters who wrought 2,300,000 two-and-a-half ton blocks of limestone for the pyramid masonry. The accumulation of this rubbish had to be disposed of, and the foremen had it carried to the edge of the plateau and shot over the face of the cliff where it still lies at the angle of rest. It is equal in bulk to about half of the mass of the pyramid itself.²⁶

²⁶ The best survey of the Great Pyramid has been furnished by Petrie, "The Pyramids and Temples of Gizeh," to which the above discussion is much indebted.

The industrial ability of the Nile-dwellers, which we found advancing so rapidly in the Early Dynasties, had in no way lagged behind the extraordinary engineering capacity which we have just been noticing. The skilful craftsmanship displayed in the cutting of the blocks for the Great Pyramid was certainly not to be expected from men whose great-grandfathers had laid the first stone masonry. The rough core masonry forming the present exterior of the building (Fig. 68) was originally sheathed in a magnificent cuirass of casing masonry extending from summit to base. Only a few blocks of this casing still survive along the base on the north side of the pyramid (Fig. 72). They were quarried away as building material by the Moslem builders of Cairo, especially from the fourteenth century A.D. In such finished masonry Petrie found joints displaying a contact of one five-hundredth of an inch, and joints of this kind are sometimes ten or twelve feet long. As Petrie has well said, we find here an accuracy like that of the manufacturing optician applied on a scale of acres.

The sovereign control of refractory materials by these consummate craftsmen at the beginning of the Pyramid Age is well illustrated by the new means of drilling which they had devised and the skill with which they applied it. The crank-drill of the Early Dynasties (Fig. 56) with a cutting edge of stone, which

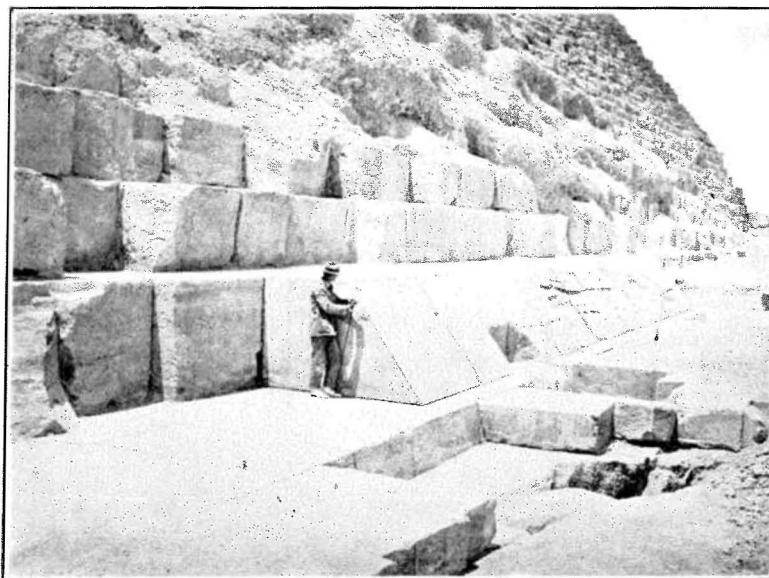


FIG. 72. BLOCKS OF CASING MASONRY OF THE LOWEST COURSE STILL IN POSITION ON THE NORTH SIDE OF THE GREAT PYRAMID. (Photograph by L. Dow Covington.)

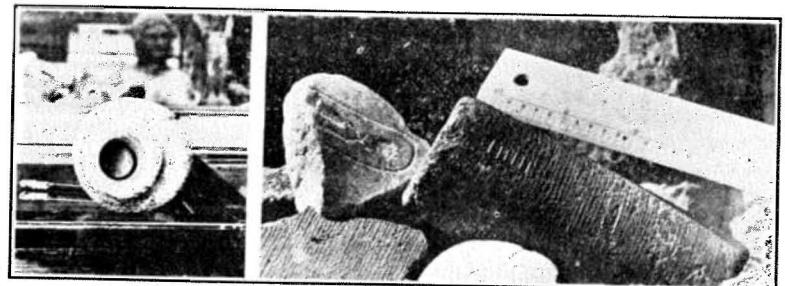


FIG. 73. UNFINISHED GRANITE VASE WITH THE BOTTOM OF THE CORE LEFT BY THE TUBULAR DRILL VISIBLE AT THE BASE OF THE BORE. (In the Field Museum of Natural History, Chicago.)

FIG. 74. CORE BROKEN OUT OF A HOLE MADE BY A TUBULAR DRILL AS SHOWN IN THE PRECEDING FIGURE. (From a photograph by Petrie.)

involved cutting out the entire mass of material included within its cylindrical bore, had been superseded by a tubular drill, presumably of copper reinforced by some cutting powder. It economized labor by boring around an interior core, which could later be broken away with a single blow (Figs. 73 and 74). This hollow tubular drill is a device which has been reinvented in our own time. The highly developed industries growing out of this ingenuity and skill in craftsmanship are elaborately displayed in colored relief sculptures in the masonry tombs of the nobles of the period at Gizeh (Fig. 67) and elsewhere in the great cemeteries of the Pyramid Age. Perhaps nothing better exemplifies the attainments which made Egypt the mother of arts than the sumptuous work of the lapidary and goldsmith (Fig. 75), which was already on its way to reach a supreme level of attainment never surpassed and rarely equaled in modern times.

The pyramid cemeteries likewise reveal to us the remarkable progress of this earliest highly cultivated age in architecture. In the development of fundamental architectural

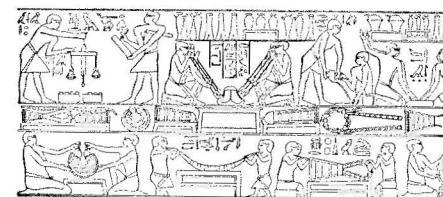


FIG. 75. GOLDSMITH'S WORKSHOP IN THE PYRAMID AGE. *Upper row:* At left chief goldsmith weighs out costly stones and a scribe records the weights; next six men with blow-pipes are blowing a fire in a small clay furnace; next a workman pours out paste; at right end four men are beating gold leaf. *Middle row:* Pieces of finished jewelry. *Lower row:* Workmen seated at low benches are putting together and engraving pieces of jewelry. Several of these men are dwarfs.

forms the so-called Second Pyramid of Gizeh (Fig. 76), built by Khafre (Greek *Chefren*, Fig. 77), displays some remarkable advances, especially in the buildings connected with it. The unprecedented exaltation of the Pharaoh's power and station was converting his tomb into a great architectural complex where the ancient and originally simple practices for the maintenance of the dead were carried on with a sumptuous magnificence which required a fitting architectural setting. The food, drink and clothing once regularly presented to the dead by merely

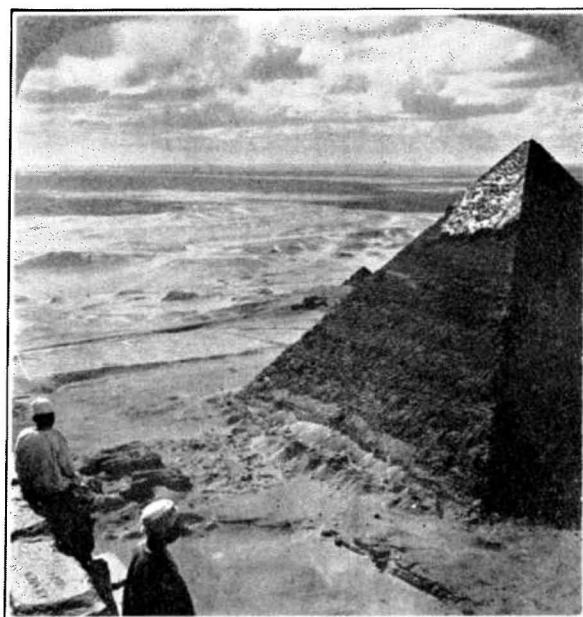


FIG. 76. SECOND PYRAMID OF GIZEH, BUILT BY KING KHAFRE IN THE 29TH CENTURY B.C. A bonnet of casing masonry is still preserved at the summit; below on the left we discern the ruins of the pyramid-temple described in the text and shown in Fig. 79. (By Underwood & Underwood, Copyright.)

setting it down before the simple tomb, now required a large and splendid building erected on the east side of the pyramid facing the royal city in the valley below. This building had thus become a mortuary temple, which we call a pyramid temple. Here ministered an endowed priesthood whose sole duty it was to maintain the offerings for the royal dead in the temple. They lived in the royal city below, and a long gallery, built of stone masonry a quarter of a mile in length, furnished them a convenient corridor, by means of which they could reach the temple above (Fig. 78). Giving access to this long cor-

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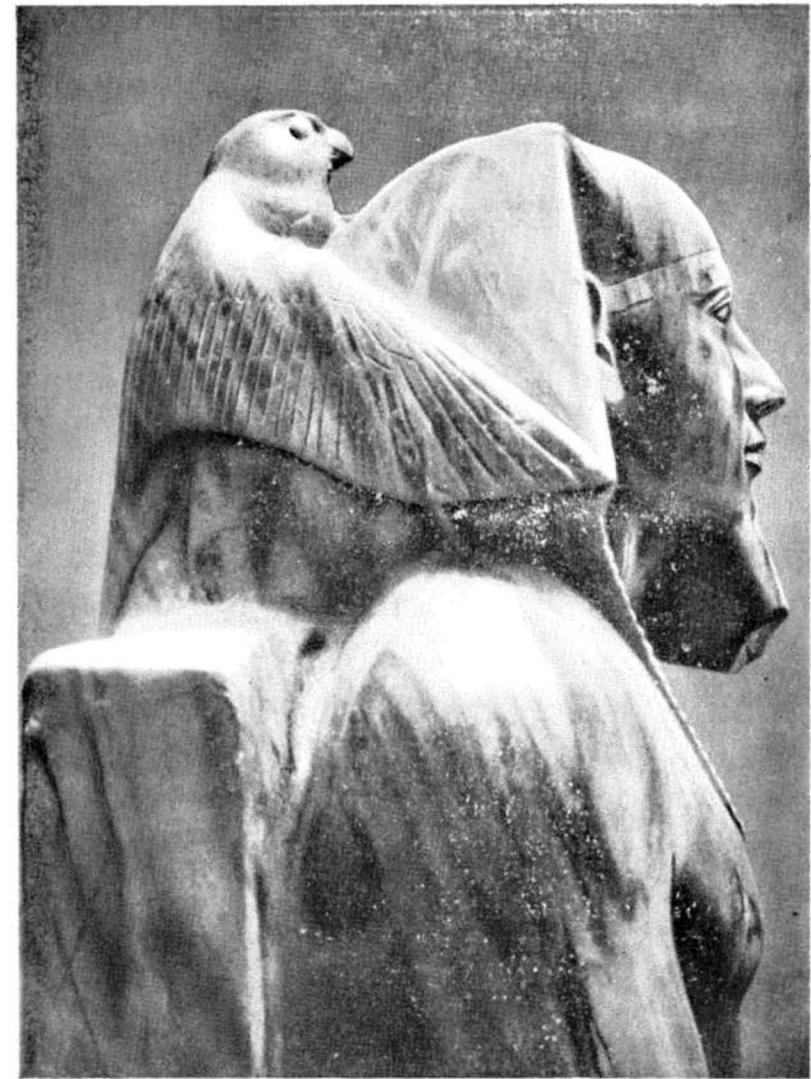


FIG. 77. DIORITE PORTRAIT OF KING KHAFRE, BUILDER OF THE SECOND PYRAMID OF GIZEH (29TH CENTURY B.C.)

ridor there was at the lower or townward end, a monumental portal building, which seems to have served also as an additional and more conveniently accessible mortuary temple. It has therefore been appropriately termed by Reisner the "valley temple." All these parts making up the new and extensive pyramid complex may be easily recognized in Fig. 78.

In the development and design of these accessory structures the pyramid builders were confronted by fundamental problems

of monumental architecture, in the solution of which they made great advances. Chief among these problems was that of carrying the roof over the void, and likewise the lighting of a hall with very thick side walls. To carry the roof over the void the Gizeh architects introduced into the hall a series of massive rectangular piers, each pier a monolithic block of polished granite (Fig. 80), brought from the First Cataract. The problem of lighting such a hall was met by raising higher than the roof on either side a middle section of the roof symmetrically placed along the axis of the building. The difference in level between this higher central portion of the roof and the lower portions on each side was occupied by light chutes, which furnished light to the hall through the roof (Fig. 79). The pyramid architects had thus produced an incipient nave roofed by a clerestory, with openings for light which were the ancestors of clerestory windows, and the fundamental elements of the basilica and its child the Christian basilica cathedral were therefore devised by the early Egyptian builders of the twenty-ninth century B.C.

Within three generations and not much more than a century after the erection of Khafre's splendid hall at Gizeh, the royal architects of Egypt were looking back upon the Gizeh buildings as crude and archaic. At Abusir, a few miles up the margin of the desert south of Gizeh, they were erecting for the Pharaohs of the Fifth Dynasty (2750 to 2625 B.C.) a wonderful

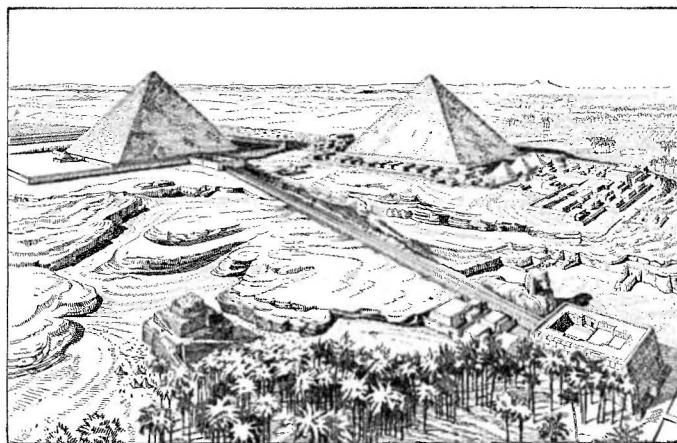


FIG. 78. RESTORATION OF THE GIZEH CEMETERY. (After Hoelscher.) The Great Pyramid of Khufu (Cheops) is on the right, from the summit of which the view in Fig 76 was taken; and the Second Pyramid of Khafre is on the left, with its temple and causeway or covered corridor connecting the temple above with the royal city below. Beside the "valley temple" giving access to the corridor is the Great Sphinx, a portrait of Khafre.



FIG. 79. INCIPENT CLERESTORY IN THE HALL OF THE VALLEY TEMPLE OF KHAFRE AT GIZEH BUILT IN THE 29TH CENTURY B.C. The narrow light-chutes occupying the difference in level between a higher roof over the nave and a lower roof beside it are the lineal ancestors of the clerestory windows of European architecture. The oblique light which they admit is seen in Fig. 80.

series of tombs (Fig. 81) displaying remarkable progress in architecture. The Abusir pyramids themselves were to be sure much smaller and less imposing than those of Gizeh, but the pyramid temples at Abusir gave the Fifth Dynasty architects opportunities not presented by the pyramid form which was a matter already settled. In place of the bare rectangular Gizeh piers of a century earlier the Abusir architects designed a series of supports (Fig. 82) each representing a conventionalized palm tree, the trunk of which formed the shaft of a column, the capital being the graceful crown of foliage surmounting the whole. Thus emerged at the hands of Egyptian architects in the middle of the twenty-eighth century B.C. the earliest known columns and the first colonnades (Fig. 83).

These earliest colonnades are notable not only as such, but also because they are the earliest outstanding examples of the Egyptian use of decorative motives taken from the vegetable

world. It showed the way for the development of the rich fund of decorative beauty which the architects and artists of western Asia and Europe, following Egypt, afterward discovered in vegetable forms, as they brought forth such things as the Corinthian column or the sumptuous carving of the Gothic cathedrals. Moving along the same line the Abusir architects also devised charming columns by the use of the lotus and papyrus, of which the latter became very common.

It is impossible within the limits of this brief sketch to discuss the social and governmental development which went on parallel with the amazingly rapid mechanical, industrial, artistic and architectural advance at which we have been glancing.

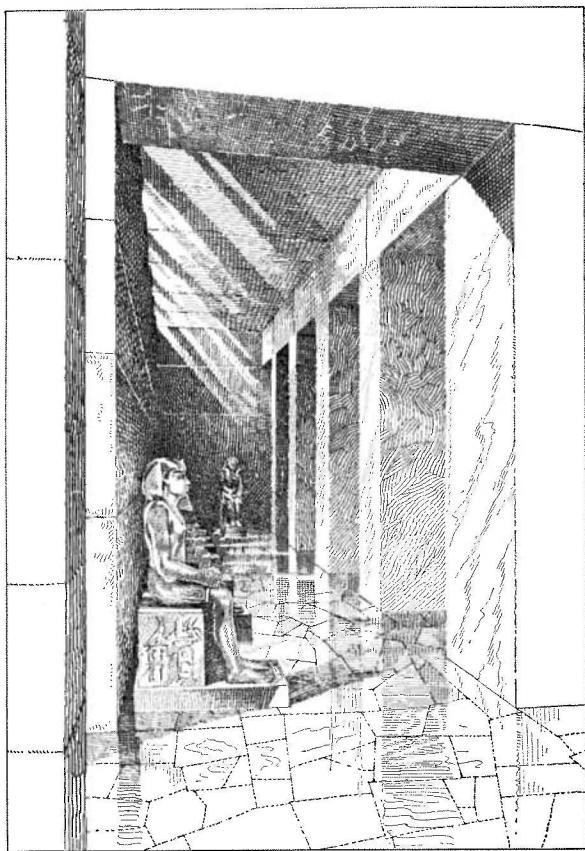


FIG. 80. RESTORATION OF CLERESTORY HALL IN THE VALLEY TEMPLE OF KHAFRE AT GIZEH. (After Hoelscher.) This is the hall seen beside the Great Sphinx at the foot of the long corridor in Fig. 78. A double row of the rectangular piers seen here supports a roof higher than that on either side of it and thus forms a real nave. The oblique light comes through the light-chutes, or incipient clerestory windows, as shown in Fig. 79.

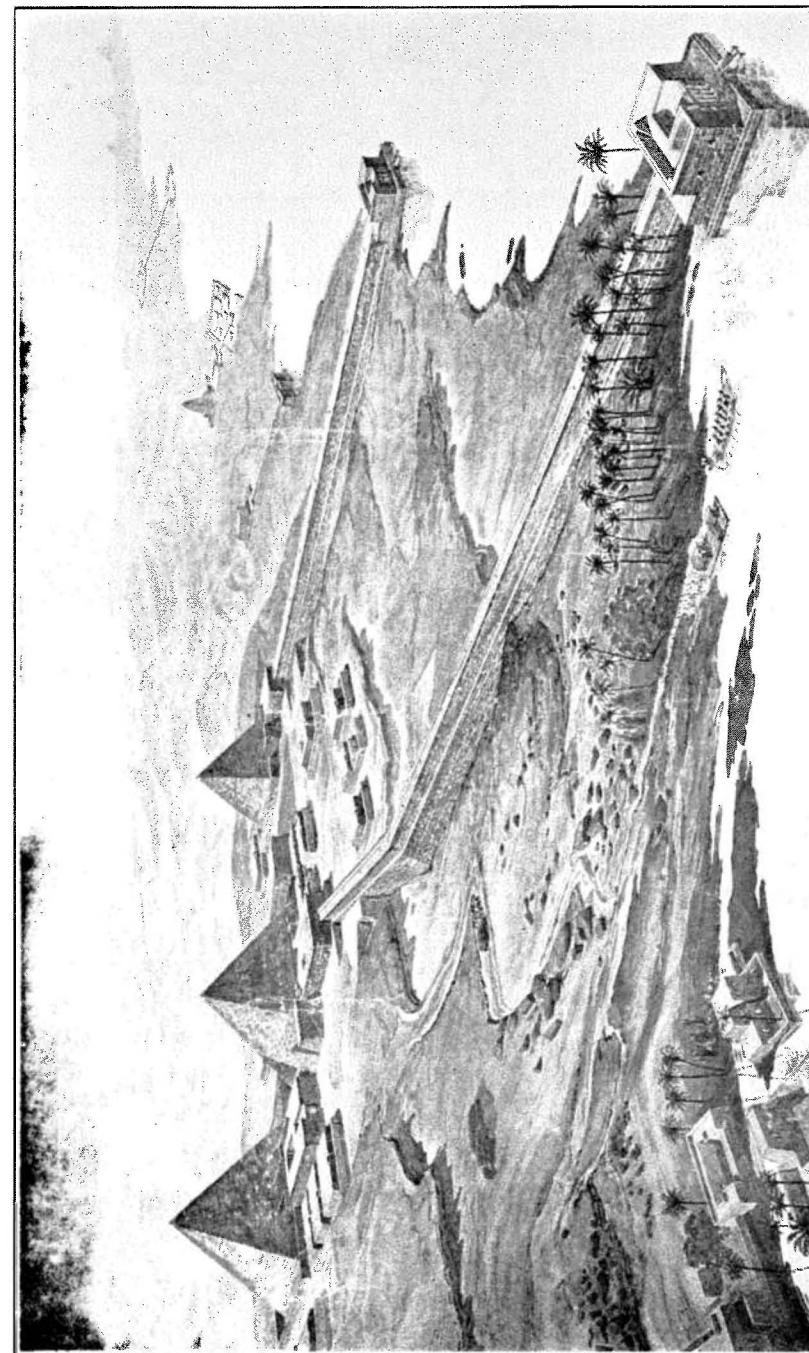


FIG. 81. RESTORATION OF THE PYRAMID CEMETERY OF THE FIFTH DYNASTY AT ABUSIR BUILT IN THE 28TH AND 27TH CENTURIES B.C. (After Borchartt.) The pyramid of Sahure, built not long after 2450 B.C., with its corridor and temples is seen in the background. Here were found the colonades and the sea-going ships shown in Figs. 82-84.

As we recall the Nile valley of the Pleistocene Age, we are conscious of the marvelous transition through which it has passed. We of America are especially fitted to visualize and to understand the wonderful transformation of a wilderness into a land of splendid cities. But the men whose powers of achievement planted great and prosperous cities along the once lonely trails of our own broad land, received art, architecture, industry, commerce and social and governmental traditions as an inheritance from earlier times. There was an age, however, when the development from barbarism to civilization with all its impressive outward manifestations in art and architecture had to be accomplished *for the first time*. That happened along the Nile, and it seems therefore like a magical transition, as we see the trail of the Stone Age hunter leading up from the river through the jungle marsh, transformed into an avenue of sculptured sphinxes and tall obelisks; while in the background where once the trail terminated at the hunter's group of wattle huts peeping through the reeds, there rises a stately city adorned with imposing temples and monuments of stone.

The prehistoric hunter whose self-expression was quite content to ply the flint graving tool in carving symmetrical lines of game beasts along the ivory handle of a flint dagger has been transformed by fifty generations of social evolution into a royal architect, able to transmute his visions of a great state into architectural forms of dignity and splendor, launching great bodies of organized craftsmen upon the quarries of the Nile cliffs, and summoning thence stately and rhythmic colonnades, imposing temples and a vast rampart of pyramids, the greatest tombs ever erected by the hand of man. We must regard these things, therefore, as the outward and monumental expression of man's social and governmental advance, with which we must also remember his unfolding inner life had kept even pace. The quickened imagination which finds expression in noble architectural forms is to a large extent a product of social development, of an imposing vision of the kingship and of the state, as well as of the exalted station of the gods who guide the state. These were new forces unknown to the life of the primitive hunters who elsewhere outside of the Egypto-Babylonian group, still continued to live by the chase throughout most of the world, or had here and there, within reach of influences from the Egypto-Babylonian group, made a beginning in agriculture and cattle-breeding.

In view of the tiny city-kingdoms, disunited and fighting among themselves, which at this time were the only organized

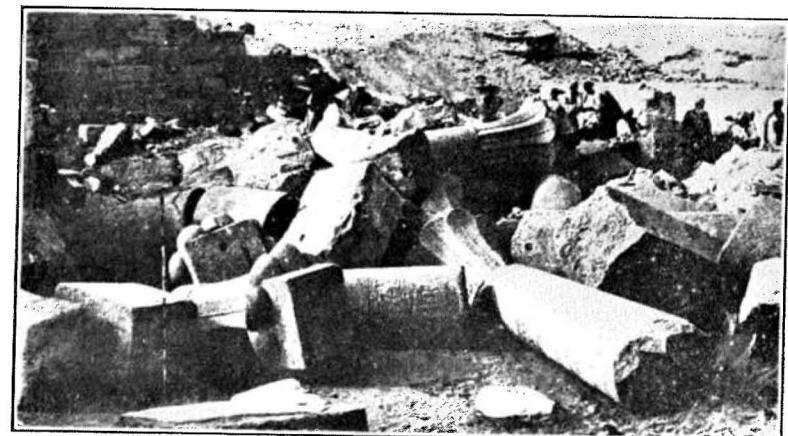


FIG. 82. MONOLITHIC GRANITE COLUMNS AS FOUND BY BORCHARDT IN THE TEMPLE OF SAHURE AT ABUSIR. (Compare Fig. 81.)

states in Babylonia, it is evident that the first great civilized nation of highly cultivated life had come into being on the Nile. Such a fabric of civilized life developed by a great community of several million souls could not exist for five hundred years without exerting a profound influence in the adjacent Mediterranean upon which it looked out and likewise in neighboring Asia which began at the eastern delta gates. The evidences for early Egyptian influences moving across the Mediterranean

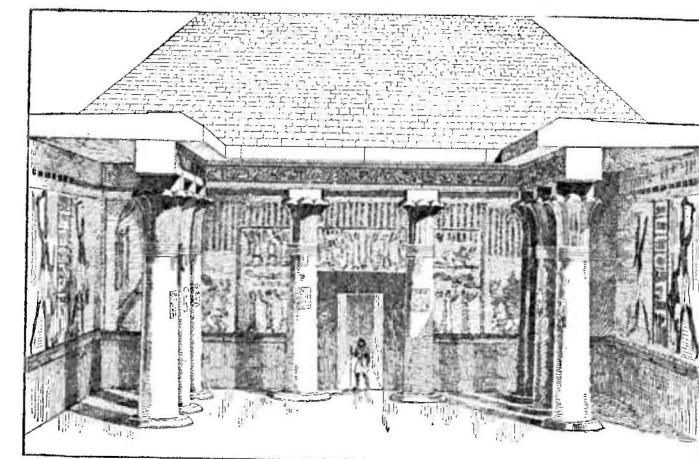


FIG. 83. RESTORATION OF THE COLONNADED COURT OF THE PYRAMID TEMPLE OF SAHURE. (After Borchardt.) From the columns found as shown in Fig. 82 it was not difficult to restore the court as it was left by the architects. This court is the oldest colonnaded structure now known in the history of architecture, having been erected not long after the middle of the 28th century B.C. It is evidently the ancestor of the colonnaded courts of Hellenistic Europe as shown in Fig. 123.

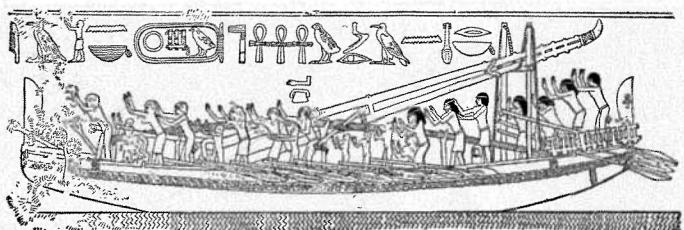


FIG. 84. EARLIEST REPRESENTATION OF A SEA-GOING SHIP, FOUND AMONG THE WALL RELIEFS IN THE PYRAMID TEMPLE OF SAHURE. (After Borchardt.) The Pharaohs of the Third Dynasty in the 30th century B.C. were already carrying on commerce in the Mediterranean with such ships as this, although this relief scene was sculptured in the middle of the 28th century. Such vessels represent the beginning of salt sea navigation.

and entering Stone Age Europe are now obvious enough. From a study of the archaic remains of Crete Sir Arthur Evans observes: "The possibility of some actual immigration into the island of the older Egyptian element . . . can not be excluded."²⁷ The excavation of the Abusir pyramids and temples has revealed the ships which carried these Egyptian influences across the eastern Mediterranean (Fig. 84). These are the earliest known sailing ships and the earliest sea-going craft of which we know the form and rig. When the Mediterranean peoples, like the Phoenicians, afterward likewise took to the sea, their ships (Fig. 116) were reproductions of these Egyptian vessels. It is therefore evident that the Egyptian sailing ships which crossed the Mediterranean at the beginning of the Pyramid Age as early as the thirtieth century B.C. were not only the first sea-going ships devised by man, but were likewise the ancestors of all salt-water craft of the early world, and hence of the modern world also. The native shipping of East Indian waters to this day exhibits details and characteristics which are of unmistakable ancient Egyptian origin.

²⁷ "New Archaeological Lights on the Origins of Civilization in Europe," presidential address before the British Association, 1916, reprinted Annual Rep. Smithsonian Inst., 1917, p. 441.

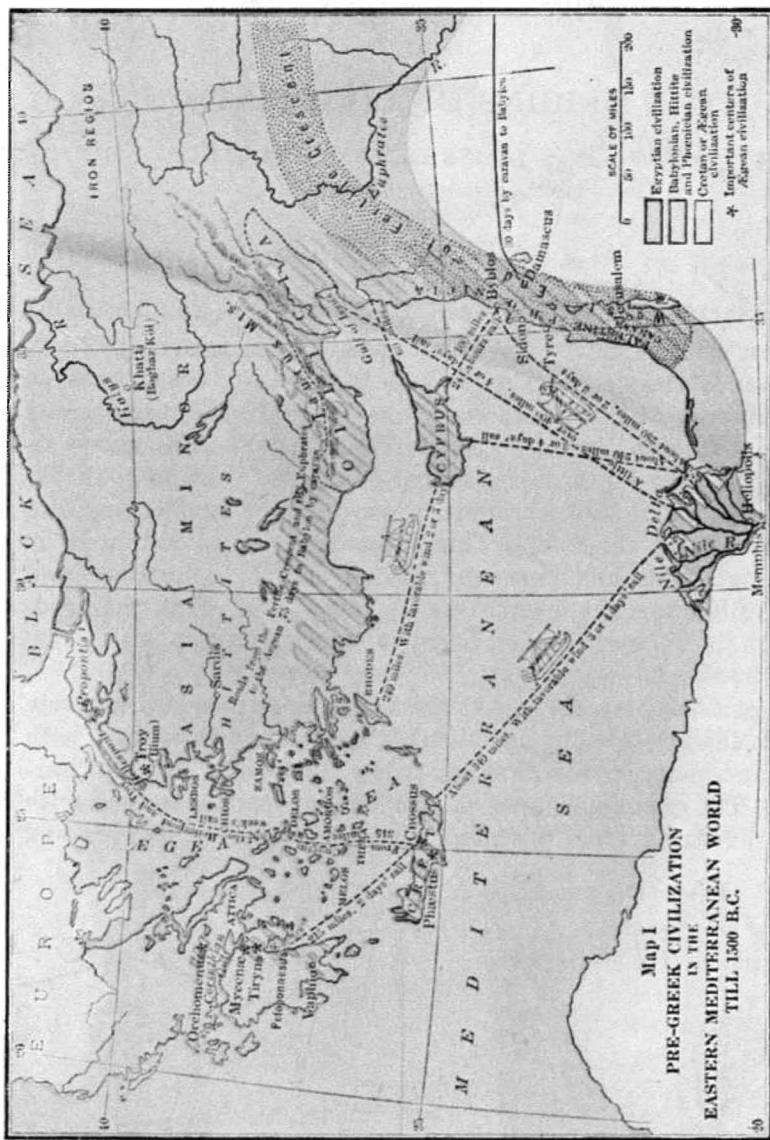


FIG. 85. MAP OF THE EASTERN MEDITERRANEAN, SHOWING ESPECIALLY THE RELATIONS OF EGYPT AND THE AEGEAN.
(From the author's "Ancient Times," by permission of Ginn & Co.)

THE ORIGINS OF CIVILIZATION

By Professor JAMES HENRY BREASTED
THE UNIVERSITY OF CHICAGO

LECTURE TWO

THE EARLIEST CIVILIZATION AND ITS TRANSITION TO EUROPE. II

Just as the Central American culture, particularly in Yucatan, was in close contact with Cuba in pre-Columbian times, so the shipping of the Pharaohs in the Pyramid Age maintained frequent intercourse with Crete. The map (Fig. 85) shows us how Crete, the southeastern island outpost of Europe, is thrust far out into the Mediterranean toward Egypt, almost opposite the mouths of the Nile. This intercourse was facilitated by favoring winds and currents making the three hundred and forty mile interval a matter of a few days' sail. Thus the products of the Nile craftsmen began to find their way into Crete after 3000 B.C.

It can be no accident that the appearance of metal in Crete and on the neighboring mainland of Asia coincides in date with the appearance of the first sea-going ships built by the Pharaohs. The peculiar copper dagger of Egypt, ornamented with lines diverging from a central rib, passed across Europe and

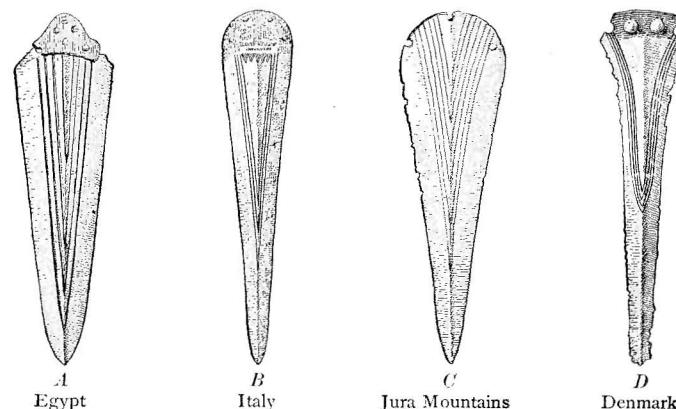


FIG. 86. COPPER DAGGERS OF EGYPT AND EARLY EUROPE, SHOWING THE TRANSITION OF METAL FROM THE NILE VALLEY TO EUROPE. (From the author's "Ancient Times," by permission of Ginn & Co.)



FIG. 87. EGYPTIAN GLAZED BEADS FOUND IN AN EARLY BRONZE AGE BURIAL IN ENGLAND. (After Sayce in *Journal of Egyptian Archaeology*, Vol. I.)



FIG. 88. STONE VASES OF EGYPT (LEFT) AND OF CRETE (RIGHT) IN THE PYRAMID AGE, SHOWING HOW THE EARLY CRETANS REPRODUCED EGYPTIAN FORMS. (From the author's "Ancient Times," by permission of Ginn & Co.)

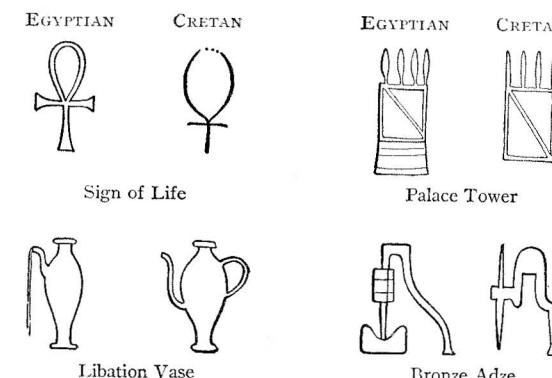


FIG. 89. EGYPTIAN HIEROGLYPHICS COMPARED WITH SIGNS FROM EARLY CRETAN WRITING. (After Sir Arthur Evans.) The signs are arranged in pairs with the Egyptian sign on the left and the corresponding Cretan sign on the right.

penetrated as far north as the Scandinavian countries (Fig. 86), and Egyptian glazed beads have been found as far westward as the Neolithic or Early Bronze Age graves of the British Isles (Fig. 87). The beautiful stone vases wrought by the skilled craftsmen of the Pyramid Age with their new tubular drill (Figs. 73-74), roused the emulation of the gifted Cretans, and they presently succeeded in making very clever copies (Fig. 88). As a result of such endeavors thriving industrial communities, exhibiting surprising native capabilities and artistic gifts, arose in Crete, and their copying, quite freed from any slavish imitation, began to display a vigorous and creative individuality which brought forth the earliest civilization on the southeastern fringes of Europe.

This new Cretan civilization, revealed to us especially by the brilliant discoveries of Sir Arthur Evans at Cnossus, and also by very creditable American excavations, continued to develop after 2000 B.C. in close contact with the Oriental life on the Nile. As the Cretans developed their own writing, the connection with Egyptian hieroglyphic is evident, as Sir Arthur Evans has showed (Fig. 89). After the expansion of Egyptian power into Asia and the Mediterranean in the Feudal Age (or Middle Kingdom, flourishing for two centuries after 2000 B.C.)

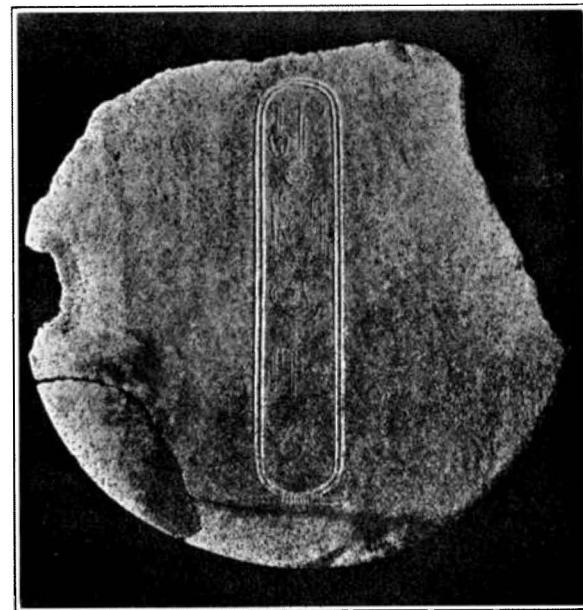


FIG. 90. ALABASTER VASE LID BEARING THE NAME OF THE EGYPTIAN PHARAOH KHIAN FOUND BY SIR ARTHUR EVANS UNDER A WALL OF THE CRETAN PALACE OF CNOSSUS—PROBABLY ABOUT THE 17TH CENTURY B.C.

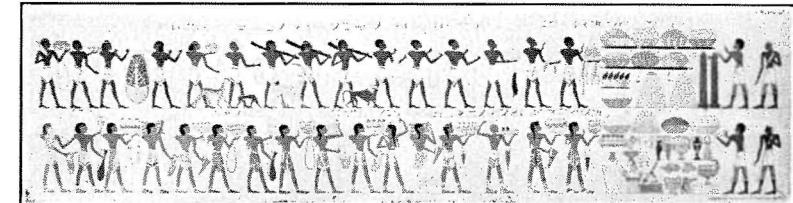


FIG. 91. A LINE OF CRETAN ENVOYS (THE LOWER ROW) IN EGYPT BRINGING TRIBUTE TO THE PHARAOH IN THE 15TH CENTURY B.C. The scene is taken from a painting on the wall of the tomb of Rekhmire, Grand Vizier of the Pharaoh Thutmose III., the greatest of the Egyptian conquerors.

and the Empire (1580-1150 B.C.), the development of the first great navy enabled Egypt to maintain unchallenged supremacy in the eastern Mediterranean and among the islands of southeastern Europe. The beginnings of this Mediterranean power of Egypt are suggested by the name of the Pharaoh Khian, engraved on an alabaster vase lid found under a palace wall at Cnossus (Fig. 90).

As the Egyptian Empire established its power in the northern Mediterranean, the Pharaoh appointed a governor over the Aegean Islands. Cretan envoys bringing their tribute to the court of the Pharaoh were a common sight in the fifteenth century B.C. (Fig. 91). Such Cretans who had visited the Nile,



FIG. 92. A CRETAN VASE DECORATED IN RAISED PATTERNS WITH EGYPTIAN FLOWERS. A fine example of the remarkable decorative art of Crete in the Grand Age about the middle of the 15th Century B.C.

and likewise Egyptian wares common in the Cretan markets, brought many a Nilotic motive into the art and life of this remarkable island people which they promptly appropriated. Thus Egyptian flowers like the lotus or the papyrus became common in Cretan art, where they were employed with new life, freedom and vigor, which are a marvellous expression of Cretan ability in decorative art (Fig. 92). This magnificent decorative art of Crete also had its influence on Egypt in return, for the situation was one in which reciprocal influences were inevitable. It is sometimes a question among archeologists as to which was the giver and which the receiver (Fig. 93).

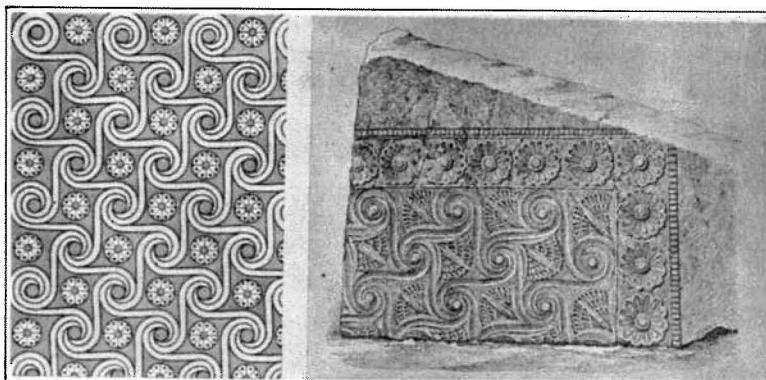


FIG. 93. CEILING DECORATIONS OF EGYPT AND MYCENAEAN EUROPE. The Egyptian pattern (on the left) is from a painted ceiling in an Egyptian tomb at Thebes (Egypt), while the Mycenaean design was carved on a tomb ceiling at Orchomenos in Greece, and belongs to the outgoing Aegean art of the period when the Greeks were already taking possession of the Aegean world—the period which was called Mycenaean after Schliemann's discoveries at Mycenae.

While the highly developed arts and crafts of Egypt furnished the Aegean world with the devices and the technical processes for carrying on a flourishing industrial life, the architecture of the Nile did not leave a noticeable mark on the fringes of Europe until the Greek Age which we are now approaching. The limited power and resources of the Cretan state or states would not have permitted any Cretan ruler to vie with the vast monumental architecture of the Nile. The gigantic clerestory hall of the Karnak temple (Fig. 94) was a structure possible only to a ruler of imperial wealth and resources, commanding a highly efficient body of architectural engineers such as existed at this time nowhere outside of Egypt. It is impossible in this brief presentation to do more than suggest in terms of such architecture as this, the imperial development which went on in Egypt after the sixteenth cen-

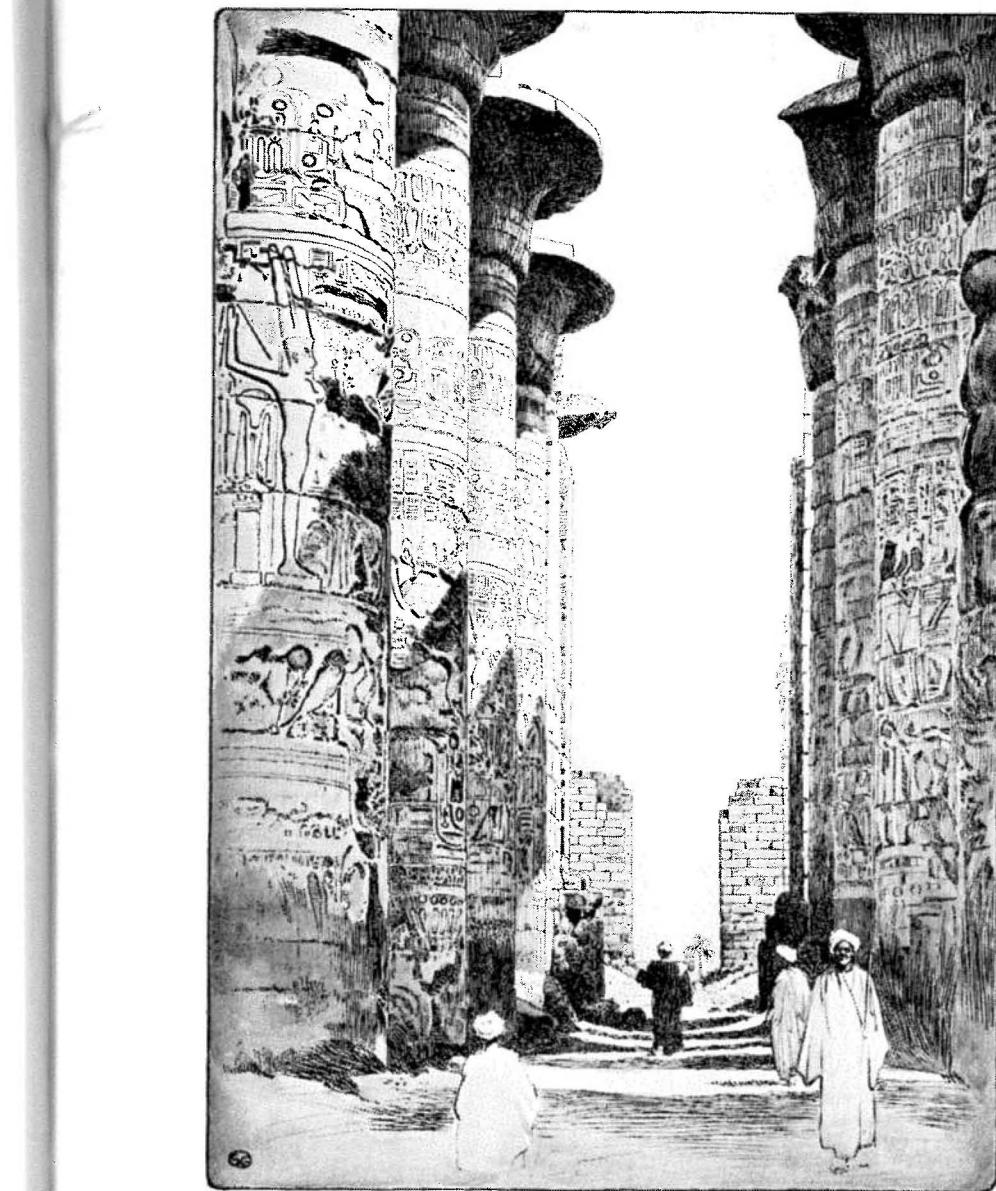


FIG. 94. COLUMNS OF THE GREAT KARNAK CLERESTORY HALL. A hundred men can stand on the capital of each column of the nave.

tury B.C. (Figs. 95-96). The resources and impulses which had prompted this great expansion of Egyptian life and power were exhausted by 1200 B.C. and fifty years later Egypt was nationally prostrate and powerless.

A similar development of human life had meantime been

going on in Western Asia, and if we have been late in reaching it, this has been chiefly due to the fact that the Babylonian world of the lower Tigris and Euphrates lay separated from the Mediterranean by a great northern extension of the Arabian desert over five hundred miles across. Babylonian civilization, thus cut off from immediate contact with the Mediterranean world and Europe, was later in affecting the tide of Oriental influences which for ages pressed upon the life of Europe and the West, and in Hebrew and Christian religion has not yet ceased to do so. Another reason which has delayed us in taking up Western Asia is found in the fact that the *prehistoric* development of the region, as we have already stated, has yet to be investigated, and as a whole to be recovered from the still inaccessible and undiscovered sources. But Babylonian influence was not less great and important because it was somewhat later than that of the Nile.

A glance at the map shows us that southern Babylonia and northern Egypt are practically in the same latitude. Yet their respective situations are totally different. Egypt, strategically considered, is surprisingly protected from invasions and assaults of foreign peoples. Its isolated situation due to the wastes of the great Sahara on each side and the Mediterranean on the north, enabled it to enjoy a continuous development uninterrupted by foreign intrusion for many centuries at a time. In an age when maritime peoples were still unknown on the Mediterranean, this body of water was a protecting barrier against the Stone Age barbarians of the north, of enormous importance to Egypt, and to this freedom from invasion at the hands of the backward northern peoples, we

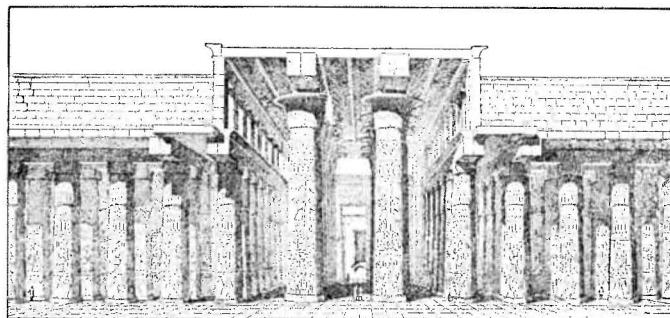


FIG. 95. RESTORATION OF THE GREAT KARNAK CLERESTORY HALL. Built chiefly by Ramses II, in the 13th century B.C., some 1,500 years after the incipient clerestory of Khafre at Gizeh (Fig. 79), it represents the culmination of a long development which has brought forth tall and stately clerestory windows in place of primitive light-chutes, and imposing colonnades in place of rectangular piers (Fig. 80). From such Egyptian temple halls the basilica structures of Hellenistic and Christian Europe have descended.

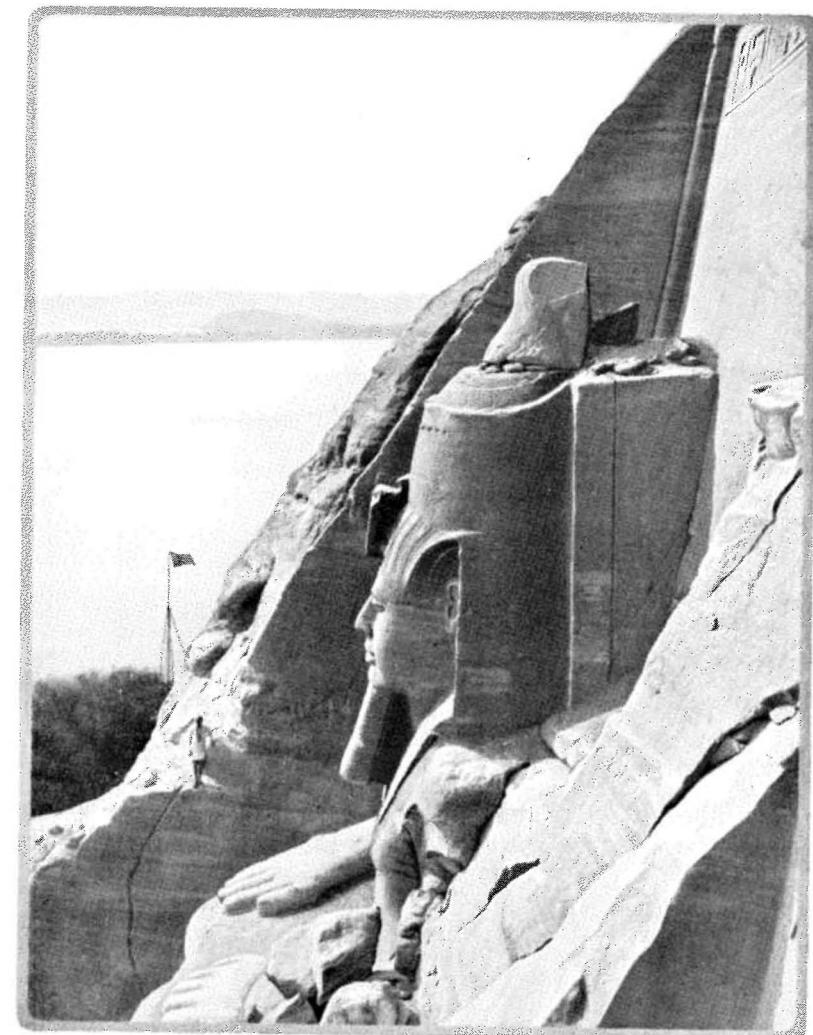


FIG. 96. ONE OF THE COLOSSAL PORTRAIT STATUES OF RAMSES II. ADORNING THE FRONT OF THE CLIFF TEMPLE OF ABU-SIMBEL ON THE NILE IN NUBIA. There are four such figures along the front of the temple: each is seventy-five feet high.

may attribute in no small degree Egypt's advance to civilization at a time when no such great civilized nation had appeared anywhere else.

The alluvial plain on the lower Tigris and Euphrates, which we call Babylonia, was, on the other hand, continually exposed to invasion by the less developed peoples of the mountains on the north and east. At the same time the nomad population, which still finds pasturage for its flocks along the northern fringes of the Arabian desert, beset Babylonia with a similar

unceasing menace from the other side. The history of western Asia is often made up of the struggle between the mountaineers on the north and the desert nomads on the south, for the possession of the Fertile Crescent which lay between, and of which Babylonia forms the eastern and Palestine the western end. It was therefore impossible for any people occupying the Babylonian Plain to develop without interference in accordance with its own capabilities and native gifts. The civilized development here was repeatedly halted and sometimes stagnated, as it has done in modern times, for centuries. This was not seldom due to the further fact that the *invasions* were often at the same time *migrations* bringing in a relatively large body of foreign population.

Retarded from prehistoric times by the rigor of the northern winters and the cold of the outgoing glacial age, western Asia was far behind Egypt at the opening of the fourth millennium

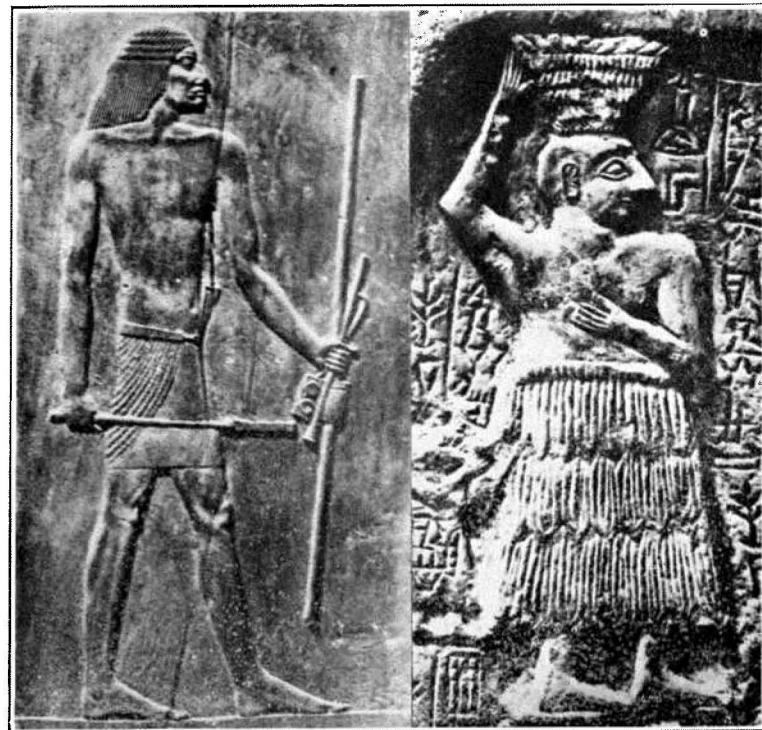


FIG. 97. EGYPTIAN RELIEF (LEFT) OF THE 30TH CENTURY B.C., SHOWING THE STANDING FIGURE OF AN EGYPTIAN NOBLE, AND EARLY SUMERIAN RELIEF (RIGHT), SHOWING THE FIGURE OF A SUMERIAN CITY KING OF THE SAME AGE. We have here an opportunity to compare the art of the two cultures at the same age. It may be noted that the Babylonian relief is a royal monument while that of Egypt is from the tomb of a noble only.



FIG. 98. THE CENTRAL PORTION OF THE MOUND OF THE OLD SUMERIAN CITY OF NIPPUR, NOW CALLED NIFFER, IN CENTRAL BABYLONIA. The highest portion of such mounds covers the public buildings and especially the temple mount or tower. (By courtesy of the University Museum, Philadelphia.)

B.C., and the prehistoric advance of Babylonia was for the reasons mentioned above so slow that in the thirtieth century B.C. her culture was still noticeably inferior to that of Egypt (Fig. 97).

The earliest towns on the Babylonian alluvium were rarely more than a few hundred paces across. They were built of sun-dried brick and as a result of the action of weather and successive destructions at the hands of hostile invaders, a considerable volume of disintegrated brick accumulated as the centuries passed. This rubbish was not cleared away when the new buildings were put up, and hence the town finally stood on a high mound (Fig. 98). Such a mound is called by the Arabs a "tell," a word which therefore appears very commonly in the geographical names of Egypt and western Asia. Traversing the Babylonian plain to-day the modern traveler is rarely out of sight of such a mound somewhere on the horizon. These are the treasures whence the evidence for the reconstruction of early Babylonian life and history is chiefly drawn. Thus far only a small proportion of the early Babylonian mounds has been excavated and thoroughly investigated. Indeed the rigorous methods of Mediterranean archeology have only recently

and in limited measure, begun to be applied to Babylonian research.

Each one of these mounds represents an early city-kingdom consisting of the town and a fringe of outlying fields. You could have walked across the whole kingdom in an hour or two. At the head of this petty realm was a king, whose monuments, excavated from the mound now covering his town, sometimes reveal him to us in primitive sculpture engaged in the ceremonious functions of his little state (Fig. 99).

The people over whom he ruled are called Sumerians in the documents of the time. While their racial origin is still uncertain, it is evident that they were not Semites, like the nomads of the neighboring desert, and their affinities are therefore to be sought in the mountains. Well back in the fourth millennium B.C. they had developed their own writing. Like the writing



FIG. 99. AN EARLY SUMERIAN CITY KING OF THE 30TH CENTURY B.C. ENGAGED IN PUBLIC CEREMONIES. The relief is engraved on the limestone base of some ceremonial object, presumably a mace, the handle of which was thrust into the hole in the middle of the block. In the upper relief the king is seen standing at the left with a basket probably filled with earth on his head. Before him in a line his children approach, and behind him is his cup-bearer. The ceremony is probably that of beginning the digging for some important public work like a canal or the foundation of a temple. Below the king is seated at the right with much the same personages about him. The birdlike features and crude drawing evince the primitive and undeveloped character of the art. The inscriptions in cuneiform record the names of the individuals shown. That of the king was Urnina, a ruler of Lagash.

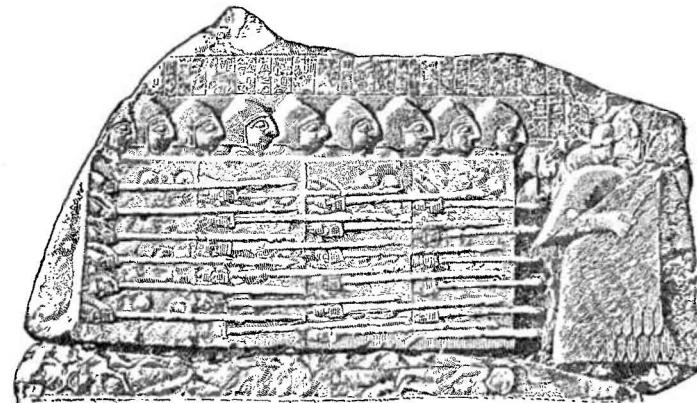


FIG. 100. A SUMERIAN PHALANX. This relief of the 29th century B.C. is a fragment of a round-topped stela commonly called the Vulture Stela, recording the victories of Eannatum, king of Lagash. The scene shows him at the head of a phalanx of the troops of his little city-kingdom.

of Egypt it grew up out of picture signs. As a result of the process of writing on soft clay tablets, the individual lines of the pictures assumed the forms of wedges, and for this reason the writing of these people has been called *cuneiform* (Latin *cuneus*, "wedge"). It never developed alphabetic signs. The Egypto-Babylonian culture group thus devised two physical processes of writing: the one by tracing the characters with a pen and a dark pigment on a vegetable membrane; the other by impressing or incising the characters on a soft or plastic substance. The latter process, that of Asia, survived for a time in

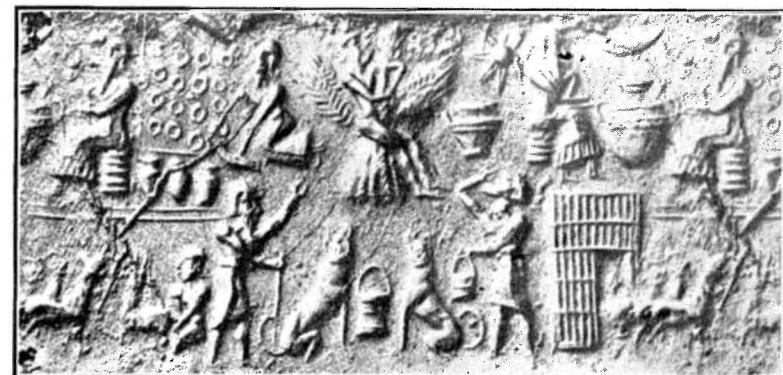


FIG. 101. EARLY SUMERIAN CYLINDER SEAL IMPRESSION SHOWING THE FIGURES OF ANIMALS IN BALANCED OR ANTITHETIC ARRANGEMENT. It must be remembered that these tiny figures were cut by the lapidary around a cylinder of hard stone not thicker than one's finger, and sometimes much smaller, and perhaps only half as long. They represent great and noble art in striking contrast with the feebleness of the sculptor in relief (Fig. 99).

the clay tablets of Crete and the waxen tablets of the Roman gentleman, and then perished; the other, the method of Egypt, still survives in the pen, ink and paper of modern usage.

These Sumerian city-kings had already gained agriculture and were practising it in the fourth millennium B.C. Their oldest documents mention emmer, wheat and barley as everyday matters. The occurrence of wild wheat, or emmer, which was the ancestor of domesticated wheat, growing in a wild



FIG. 102. AN EAGLE SURMOUNTING TWO ANTITHETICALLY PLACED LIONS FORMING THE ARMS OF THE CITY OF LAGASH. Engraved on a silver vase of king Entemena of Lagash in the 29th century B.C. It forms a fine example of early Babylonian heraldic art.

state in western Asia as far east as the Kermanshah Pass, may yet lead to the conclusion that it was domesticated in Babylonia, but we must make the botanical exploration of the Near East more nearly complete before this question can be finally settled. That wheat and barley were domesticated by the Egypto-Babylonian group and passed thence into Europe is, however, perfectly clear.

Cattle and sheep were likewise possessed by these people long before 3000 B.C. Further investigation of the culture levels of the fourth millennium, still almost untouched, will be necessary before we can reach final conclusions regarding the sources of these animals. It is interesting to observe that the Sumerians already possessed the wheel as a burden-bearing device, so that they were able to build wheeled carts. It is pos-



FIG. 103. THE ARMS OF LAGASH AS SHOWN IN FIG. 102, FROM A PLAQUE OF BITUMINOUS CLAY.

sible that they already employed the ass to draw such carts. In any case they possessed the animal in a domesticated state, a fact which points toward connection with Egypt. At the same time they came into possession of copper. The earliest dated pieces of copper in Asia are a thousand years later than the copper needles of the earliest graves in Egypt, and it is evident where we must look for the original home of metallurgy.

These early Sumerian city states were constantly embroiled in petty wars among themselves. The art of warfare among them had reached an extraordinarily high development, far superior to that of Egypt. It is a justifiable generalization to say that the arts of peace were developed chiefly in Egypt, while those of war were due to the peoples of western Asia, especially the Sumerians and Assyrians. We find the Sumerians already employing the phalanx as early as the twenty-ninth century B.C. (Fig. 100). The Egyptian monuments show that this formation had reached the Mediterranean by the twelfth century B.C., and there can be no doubt that the later Greek phalanx was inherited from the ancient Sumerians. It may be a fair question whether the existence of this formation among the Sumerians at such an early date does not point to a western origin for them somewhere in Asia Minor, whence their military experience was easily communicated to Europe.

While early Sumerian art as exhibited in sculpture was at first crude and backward (Fig. 99), the Sumerians developed a decorative art of epoch-making importance. It was practised with the greatest success by the lapidaries, who were called upon to produce the stone cylinder seals employed by the Sumerians to seal their clay documents. The content of this decorative art was chiefly animal and human figures arrayed in a balanced or antithetic arrangement (Fig. 101), which we have already seen in the prehistoric art of Egypt (Fig. 63). As employed by the Sumerians these groups were given startling vigor and power by depicting the figures in violent motion or engaged in tremendous muscular effort. Thus arose the heraldic art familiar to us all in the "lion and the unicorn." The Sumerians therefore contributed to the decorative art of the world a rich treasury of powerful forms to which it has ever since been indebted.

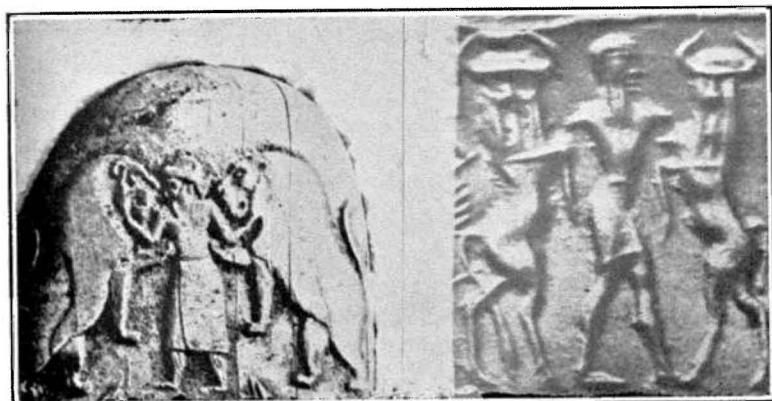
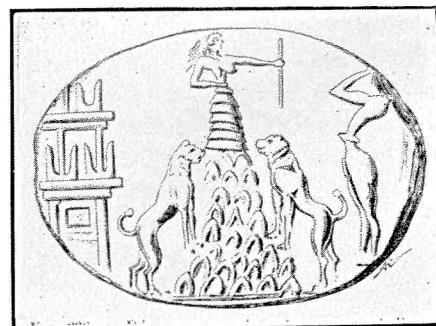


FIG. 104. BALANCED ANIMALS, EGYPTIAN, SUMERIAN AND AEGEAN. Antithetically placed animal figures were common in the art of Egypt from the remotest times, probably earlier than in Babylonia, as noted in Fig. 63. They are a conclusive evidence of the culture diffusion within the Egypto-Babylonian group, whence such influences passed to the Aegean as shown in the last figure of the three.



Among such figures is that of an eagle with its wings and talons extended in antithetic arrangement. With its talons the bird at the same time clutches the backs of two lions, likewise antithetically placed (Figs. 102 and 103). The lions sometimes turn their heads and set their teeth savagely into the outspread pinions of the eagle. This device formed the emblem of the Sumerian city of Lagash, that is, what we should now call the arms or armorial bearings of the little kingdom. The eagle with outspread wings early passed into Asia Minor (or is this another evidence of the origin of the Sumerians in Asia Minor?), and thence into the Aegean (Fig. 104) and Europe, where we are familiar with it in the arms of the southeast European states, like Austria. It eventually reached the German states, like Bavaria and Prussia, and later also Russia and France. It was from these European sources that we drew our own American eagle, for the earliest ancestry of which we must therefore go back to an ancient Sumerian city-state.

Lack of stone in Babylonia prevented the development of such massive monumental architecture as we have found on the Nile. The Sumerian builder was dependent exclusively upon brick, chiefly sun-dried, but occasionally baked to protect the faces of his larger structures from the destructive action of rain. His buildings were almost all small and unpretentious. He never undertook a treatment of the void, such as developed the piers and colonnades of Egypt. Western Asia was therefore entirely without the column until Greek times, notwithstanding the elaborate colonnades with which Ferguson and other historians of architecture have embellished their restorations of western Asiatic buildings. The Sumerian architect's

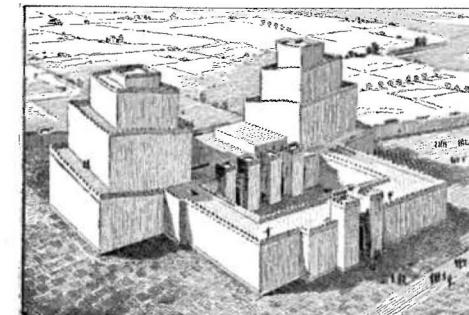


FIG. 105. A PAIR OF EARLY ASSYRIAN TEMPLE TOWERS, ILLUSTRATING THE TEMPLE TOWER OF THE SUMERIANS. (After André.) Such towers were not commonly erected in pairs. These two belonged to the double temple of Anu and Adad in the city of Assur, and as restored by the excavators they serve very well to illustrate the earlier Sumerian temple towers. It was such a structure which gave rise to the tradition of the tower of Babel. From it have descended the prevailing types of tower and spire architecture in Europe (see Fig. 126).

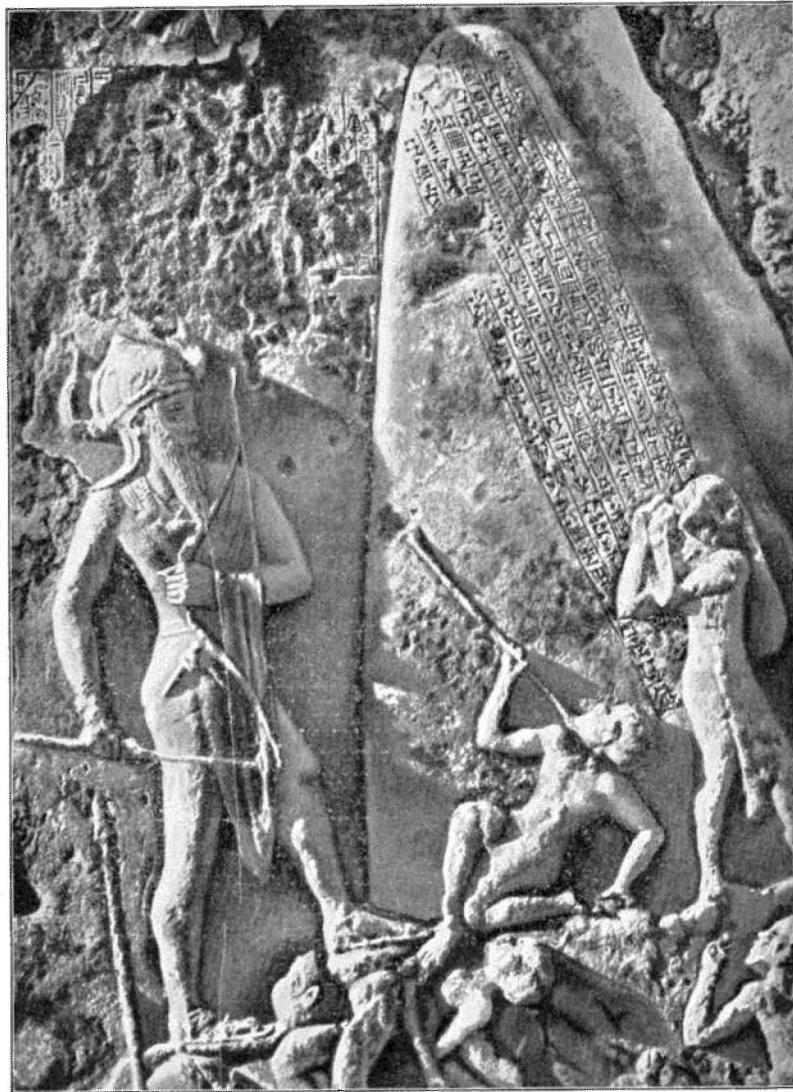


FIG. 106. MONUMENT OF VICTORY OF THE SEMITIC KING NARAMSIN OF AKKAD: THE EARLIEST GREAT SEMITIC WORK OF ART (28th century B.C.). The king, whose figure is depicted in heroic proportions, has pursued the enemy to the summit of a mountain. The artist has selected the dramatic moment when the foe has surrendered and the king indicates his merciful intentions by lowering the point of his weapon.

device for carrying the wall or the roof over the void was the arch and the vault, and he never made wider interiors than he was able to span with his vault. It was from the buildings of western Asia, as we shall see, that the arch was transmitted to Europe.

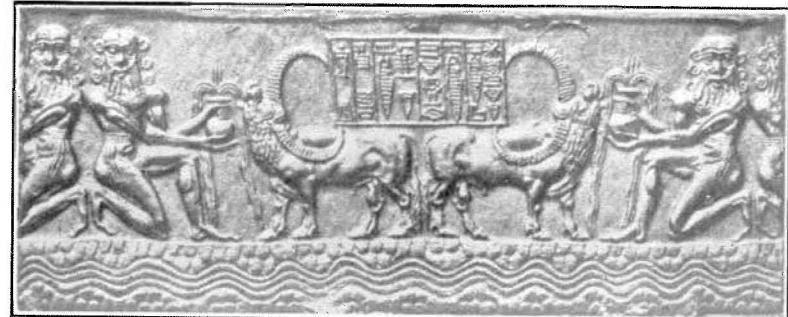


FIG. 107. IMPRESSION FROM A BABYLONIAN CYLINDER SEAL OF AKKADIAN AGE IN THE OLD SUMERIAN MANNER. (Collection de Clercq.)

While the Sumerian made no contribution to the treatment of the *void*, he was the more successful in his handling of the *mass*. He broke up the monotonous surfaces of his brick walls by a rhythmic distribution of alternate panels and pilasters. As to the form of the mass he made a real contribution in the artificial temple mount erected alongside the sanctuary in the form of a rectangular tower with an ascending ramp winding about it from base to summit by which the priest climbed to the top (Fig. 105). This structure, which gave rise to the legend of the Tower of Babel, marked the entrance of the tower into architecture. From it have descended the leading tower forms of the West, as we shall see.

It will be seen that Sumerian civilization made fundamental contributions to the life of man, to which we are still indebted. The exposed situation of their home, however, as we have already stated, made it impossible for them to continue an uninterrupted development. The Semitic nomads who drifted down the Two Rivers, were strong enough to set up a small kingdom in the district of Akkad, the northern portion of the Babylonian Plain. We can trace the career of the Sumerian city-kings from their earliest emergence in the thirty-first century B.C., for about three centuries, and then in the middle of the twenty-eighth century the Semitic rulers of Akkad contributed the first great Semitic leader in history, whom we now call Sargon of Akkad. Although these Akkadian Semites were obliged to make the revolutionary transition from the primitive nomadic life of the desert without writing, arts or institutions, to the civilized life of the Sumerian towns, in short to shift from the tent to the sun-dried brick house, they eventually outstripped their Sumerian teachers, on whom they were at first completely dependent.

Under Sargon they were so completely master of the Sumerian art of war that they gained the leadership of the Babylonian Plain, and the descendants of Sargon continued to rule there for some two hundred years. A noble stela recording the victories of Naramsin, an able ruler of this line, reveals to us the superiority of the Semitic Akkadian in art (Fig. 106). It is the first great Semitic work of art. A comparison with Fig. 99 will demonstrate how far the art of Babylonia had advanced since the early days of the Sumerian city-kingdoms. The Semite displayed his superiority in the same way in the magnificent cylinder seals of the time (Fig. 107). These, like the relief of Naramsin (Fig. 106), belong among the great works of art of all time.

While the Sumerian towns regained the leadership and



FIG. 108. DIORITE SHAFT BEARING THE GREAT CODE OF HAMMURAPI (early 21st century B.C.). (Compare Fig. 132.)

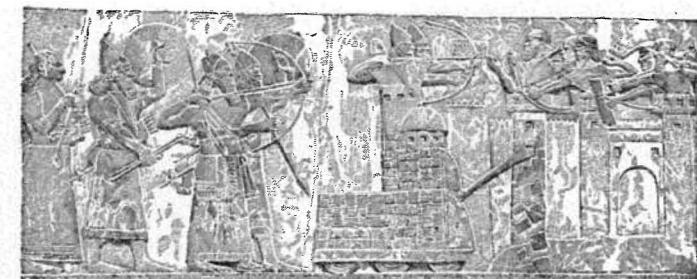


FIG. 109. A SIEGE ENGINE OF THE ASSYRIANS IN THE NINTH CENTURY B.C. A city at the right is being attacked by the Assyrian machine seen in the middle. The machine is on wheels operated by men concealed within. A turret with peep holes protects the commander of the machine, and a firing tower (also with peep holes) is occupied by two archers at the top. A heavy metal-tipped beam (which later passed to Europe as the "battering ram") is swung by concealed men against the walls and the results are seen in the falling fragments of the wall. It will be seen that this is a man-power tank, lacking only gunpowder and gasoline power to make it a modern tank. Note the armor on front, over turret and around the firing tower. The scene is from a relief adorning the palace of King Assurnasirpal, and now in the British Museum.

struggled for centuries with waning power, to maintain it, the rise of a new Semitic line, living at the still insignificant town of Babylon, completely crushed the Sumerians and they never after regained the leadership of the region. Like Latin in the medieval church, their language still survived, especially in the literature of religion, and their cultural contributions had long since become a permanent element of western Asiatic civilization. The life of their towns, however, languished and declined, never to rise again. They are marked to-day by a line of mounds along the lower Euphrates, most of which still await excavation.

The powerful Semitic line which had elevated Babylon to the leadership of the plain to which the city gave its name, culminated in the rule of Hammurapi after 2100 B.C. A remarkable monument of this great man's administrative ability has survived to us in the splendid shaft bearing his code of laws in 3,600 lines, the earliest surviving code (Fig. 108). It is a remarkable expression of that ability to organize the material interests of life, especially business and commerce, which as we shall see, later contributed essentially to the rising civilization of Europe.

The reign of Hammurapi, which unified Babylonia and a considerable outlying region round about it, was the culmination of a thousand years of civilized development, from the thirty-first to the twenty-first century B.C. This is the first thousand years of which we can discern the general historical

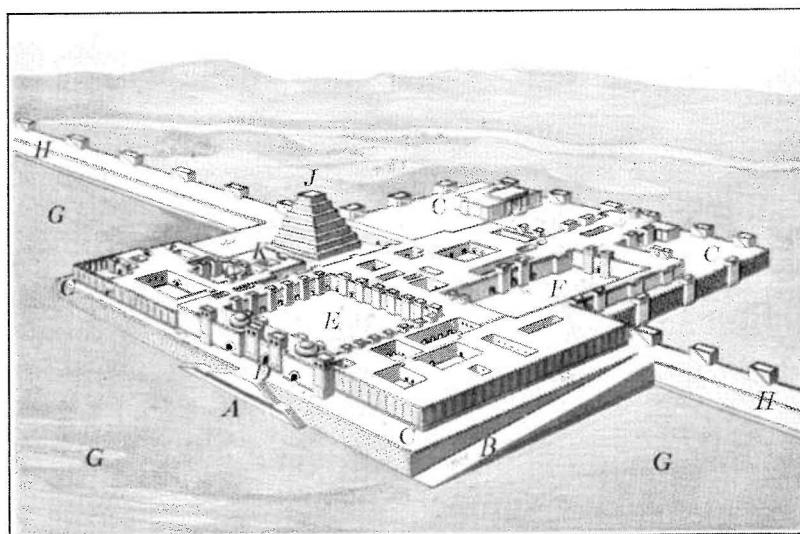


FIG. 110. RESTORATION OF THE GREAT PALACE OF SARGON II AT KHORSABAD.—Eighth century B.C. (After Place.)

drift in western Asia. Hammurapi's successors were not able to maintain the unity of Babylonia, and the Semite yielded the leadership of the plain for many centuries to non-Semitic mountaineers, a new group of invaders of uncertain race whom we call Kassites. They were little better than barbarians and under them the life of the Babylonian plain relapsed into a stagnation so lethargic that it did not revive for almost a thousand years after Hammurapi's time.

Meantime another Semitic group which had found lodgment and a convenient stronghold on a spur of the eastern

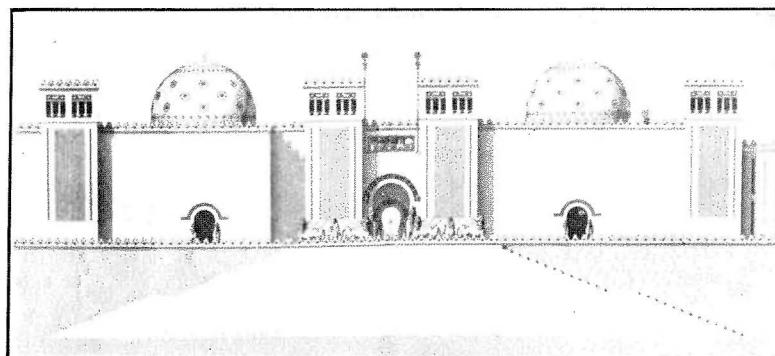


FIG. 111. ARCHED DOORWAYS OF THE FAÇADE OF SARGON II'S PALACE AT KHORSABAD. (Eighth century B.C.) This façade with its three arches was the ancestor of the Roman triumphal arch (Fig. 125), and eventually of the façade of the Christian cathedral with its three arched doorways.

mountains on the upper Tigris, had been developing in obscurity since the days of the early Sumerian city-kingdoms. Its stronghold was known as Assur, from which our familiar designation Assyria has descended. As a result of their exposed situation the Assyrians early produced hardy soldiers; and a nation of peasants and herdsmen, developing on a basis of old Sumerian civilization, with which were combined numerous characteristics of the mountainous north, became the greatest military power, not only of western Asia, but also of the whole ancient world of that age (Fig. 109).

By the middle of the eighth century B.C. the Assyrian kings were ruling a great Western Asiatic Empire, which was advancing its frontiers in almost all directions not limited by the desert. After the fall of the peoples along the eastern Mediterranean coast, including the Hebrews and Phoenicians, in the latter half of the eighth century B.C., the conquests of Sargon II. raised Assyria to a height of power and splendor never before enjoyed by an ancient people. Not far northeast of Nineveh Sargon erected a magnificent palace and city which he called Dur-Sharrukin ("Sargonburg," Fig. 110). It was fitting that this splendid architectural expression of Assyrian power should stand forth as the earliest great monumental architecture of Asia. The old Sumerian buildings, the Syrian palaces, and even the extensive capital city of the Hittites were insignificant compared with it. Its vast staircase, the first great monumental *escalier* in the history of architecture, the spacious arched doorways and enormous sentinel animals of sculptured stone, embellishing the imposing facade (Fig. 111), brilliant with designs in brightly colored glazed brick—all this proclaimed a new imperial age in western Asia. Under Sennacherib and Assurbanipal (Sardanapalus), the walls and splendid palaces of Nineveh stretched for two miles and a half along the banks of the Tigris. National greatness and power, which do so much to quicken the creative imagination of the architect, as we have observed in Egypt, had thus brought forth the first monumental architecture of Asia on a grand scale.

It is a significant fact that the iron mines of northeastern Asia Minor, which had been worked by the Hittites as far back as the thirteenth century B.C., made the Assyrian armies the first great armies of the ancient world to carry weapons of iron. Over against Assyrian ferocity in war, however, even though it was rendered the more dreadful by these terrible weapons, we should in fairness write down not a few other important considerations which essentially alter our estimate of

the character and effects of Assyrian supremacy in the ancient world. We can not even summarize these in this slight presentation, but one of them we have suggested in our references to Assyrian architecture, and another which ought not to be overlooked is the presence of a cuneiform library in the palace of Assurbanipal at Nineveh, the earliest known library in Asia, and centuries older than the oldest royal library among the Greeks.

While the Oriental world, or a large part of it, had been slowly coming under the domination of Assyria, the most fundamental changes had been going on in southeastern Europe as far back as the fifteenth century B.C. The pastures of inner Asia which stretch westward around the north end of the Caspian and along the northern shores of the Black Sea to the mouths of the Danube, have for ages been a great inter-continental sluice-way along which the nomadic peoples of Asia have swept into Europe. Somewhere, along the Asiatic stretches of these grass lands in the third millennium B.C., there lived a group of nomads whom we call Indo-Europeans. Some of their descendants shifted southward along the east side of the Caspian to enter India, as the Sanscrit peoples; while a similar group pushed southwestward to reach the frontiers of Babylonia eventually as the Medes and Persians. Others drifting westward along the north side of the Black Sea finally found their way into the Balkan Peninsula. These were the ancestors of the Greeks. Such at least is the more probable reconstruction growing out of the scanty and difficult evidence now available.

Probably by 2000 B.C. these barbarian nomads, the ancestors of the Greeks, were driving their flocks southward through the passes of the Balkans. Reaching southern Greece by 1500 B.C., they had landed in Crete probably by 1400, and before 1000 B.C. the barbarian Greek tribes had taken possession of the remaining Greek islands and the coasts of Asia Minor, in short of the entire Aegean world. Thus the wonderful Cretan civilization which had grown up in southeastern Europe was overwhelmed and crushed by barbarous invaders who had hardly advanced beyond the Stone Age life of earlier Europe. Such of the unfortunate Cretans as were able to do so took to flight, escaping southward and eastward across the Mediterranean. The Pharaohs of the declining Egyptian Empire in the twelfth and thirteenth centuries B.C. were obliged to meet these northern Mediterranean fugitives as enemies, and the temple records of Egypt's wars at this time reveal to us the fleet of Ramses III.

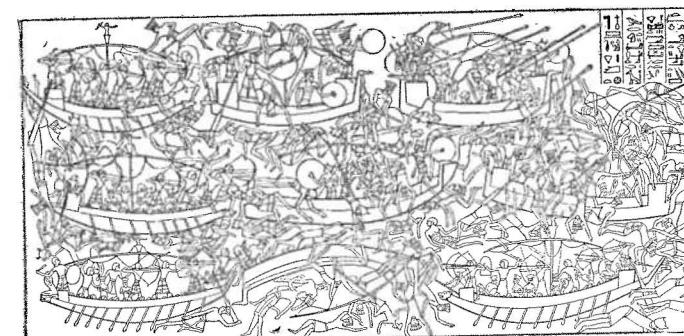


FIG. 112. AEGEAN FUGITIVE FLEET DRIVEN FROM CRETE BY THE GREEK IMMIGRATION AND FIGHTING AN ENGAGEMENT WITH EGYPTIAN FLEET OF RAMSES III. OFF THE SYRIAN COAST. (Early 12th century B.C.) The scene is sculptured on the wall of a Theban temple of Ramses III, and is the earliest surviving representation of a naval battle. The five Cretan vessels may be distinguished from the Egyptian battleships by the fact that the Cretans have all lost their oars. One Cretan ship is overturned. The high bow and stern of these northern Mediterranean vessels shows that they have been copied from the early Egyptian craft, the first sea-going ships (Fig. 84). The Egyptian fleet kept its distance and won the battle by the use of archery, before which the heavy armed Cretans were helpless. (From a drawing in the author's "Ancient Times," by permission of Ginn & Co.)

crushing a fleet of the fleeing Cretans. It is the earliest naval battle of which we have any representation (Fig. 112). Some of the Cretans found a new home on the shores of Syria and Palestine and we are familiar with one group of them as the Philistines.

Civilization, after having maintained itself for perhaps a thousand years in extreme southeastern Europe, was thus overwhelmed and blotted out by the northern Greek barbarians, who were only prevented by the Mediterranean from extending their invasion southward and destroying the civilization of Egypt. We have here a striking illustration of how the Mediterranean saved Egypt from a destructive invasion such as those to which Babylonia and the Mesopotamian world were continually exposed. Under the shadow of the great civilizations of the Orient, the rude Greek nomads settled down among the wreckage of the Cretan and Mycenæan palaces. Cretan writing, the earliest writing in Europe, disappeared. The drawings on Greek pottery (Fig. 113) of the eighth century B.C. are not as good as those of the Paleolithic hunters in the caves of southern France ten thousand years earlier, and no better than many made by our own American Indians.

During the flourishing days of the Assyrian Empire, which stopped Greek colonization in Asia east of Tarsus, the life of Greece developed slowly under the influences of Oriental civilization. The civilization which thus arose in Europe *for the*

second time was exposed to the forces of civilized life in the Near East which had so long been converging with ever increasing power on the Greek world. The agencies by which these influences chiefly operated were commercial, and the routes along which they came were in the main through Asia Minor and across the Mediterranean. Through Asia Minor came Babylonian business usages, like credit, and weights and measures; while coinage, which arose in Asia Minor, reached the Greeks in the seventh century B.C.

The decline of Egypt and the destruction of the Cretan fleets left the Mediterranean free to exploitation by the maritime cities of the Phœnicians, which gained great commercial power and wealth, and became the common carriers of the Mediterranean after 1000 B.C. The Phœnicians were clever imitators and their leading cities became the centers of an active industrial life of which the output was a curious composite of Egyptian and Asiatic elements. The latter were in turn a composite of Sumerian, Akkadian, Assyrian and Hittite, but chiefly Sumero-



FIG. 113. ARCHAIC GREEK PAINTED POTTERY VASE OF THE DIPYLON TYPE DATING FROM THE EIGHTH CENTURY B.C. A comparison of the crude painted decoration on this vase with the wonderful Cretan decorated vases like Fig. 92, will illustrate the collapse of civilization due to the invasion of the cultivated Aegean world by the barbarian Greeks during the latter half of the second millennium B.C. (By courtesy of the Metropolitan Museum of Art, New York.)



FIG. 114. SILVER PLATTER MADE BY PHœNICIAN CRAFTSMEN AND ENGRAVED BY THEM WITH EGYPTIAN DECORATIVE MOTIVES. Now in the Berlin Museum.

Semitic. Their arts and crafts and industrial processes, like the making of glass, the pouring of hollow casts, and the production of diaphanous linens, they learned from the Egyptians; while their decorative art combined the vegetable motives and the sentinel animals of the Nile with the balanced human and animal figures of the Euphrates (Figs. 114–115a).

The Phœnicians learned shipbuilding from the Egyptians and copied the models of the Egyptian ships which had been entering their harbors since the thirtieth century B.C. (Fig. 84). This is quite evident from the paintings of early Phœnician

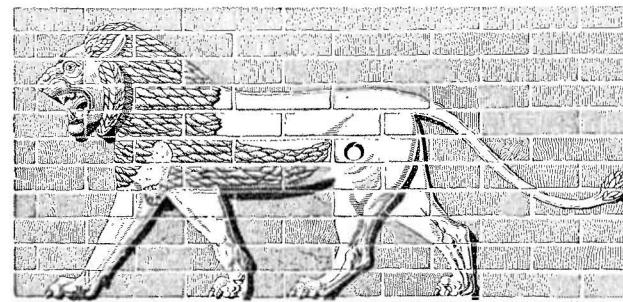


FIG. 115. IVORY COMB MADE BY PHœNICIAN CRAFTSMEN AND DECORATED BY THEM WITH A LION DRAWN FROM ASSYRIAN SOURCES. The lion in gorgeously colored glazed brick was one of a line decorating the wall on both sides of a festival avenue of Nebuchadnezzar at Babylon. It was drawn by the Babylonian architects from such decorations in the Assyrian palaces (c.g., Fig. 110).

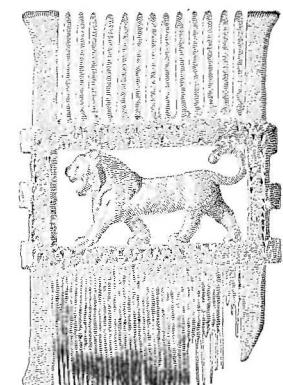


FIG. 115A. ANCIENT PHœNICIAN COMB OF CARVED IVORY.

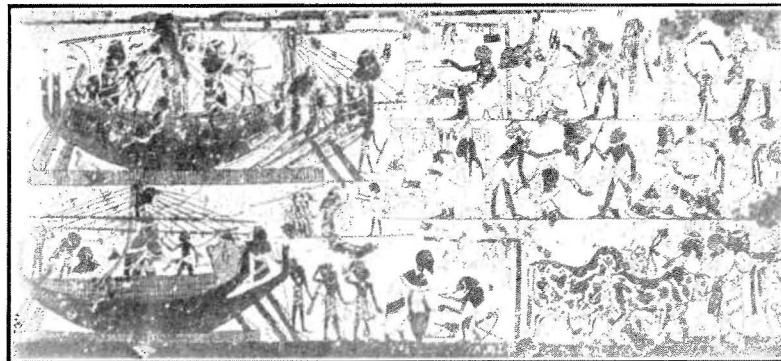


FIG. 116. PHÖENICIAN SHIPS LANDING AT AN EGYPTIAN MARKET PLACE IN THE 15TH CENTURY B.C. (After Daressy.) The model of the Phoenician craft, with high bow and stern, shows that the Phoenicians built them in imitation of the earliest Egyptian sea-going ships (Fig. 84). The Phoenician merchants, clearly marked by their foreign costume, may be seen trafficking in the Egyptian bazaars. It was here that they learned the arts and crafts and the decorative motives which they then so freely introduced in their home ports, and transmitted throughout the Mediterranean, and also as far east as Assyria and Babylonia. The scene is taken from a wall-painting in an Egyptian tomb at Thebes in Upper Egypt.

ships preserved to us in the Egyptian tombs (Fig. 116), and dating from the fifteenth century B.C. Against the old tendency to attribute too great importance to the cultural activities of the Phoenicians in the eastern Mediterranean, there has been a natural reaction; but it has gone much too far, and has overlooked new and important evidence like the painting of the Phoenician ships in Fig. 116. Here the Phoenicians are shown trafficking in the Egyptian bazaars, whence they drew the processes of industrial art, as well as its decorative motives. Similarly, unfinished work in ivory has been found in Assyria, still bearing the Phoenician workman's scribbled notes. As practisers and distributors of borrowed Oriental arts throughout a large area in Western Asia, and very widely in the Mediterranean world, the Phoenicians played an imposing rôle in the early centuries of the last millennium before the Christian Era. Phoenician merchandise like the ivory comb of Fig. 115² was common as far west as the Spanish Peninsula, where such things are found in early burials.

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THE ORIGINS OF CIVILIZATION

By Professor JAMES HENRY BREASTED

THE UNIVERSITY OF CHICAGO

LECTURE TWO

THE EARLIEST CIVILIZATION AND ITS TRANSITION TO EUROPE. III

AS the Greek nomads ceased to wander and gradually shifted to a settled town life, they found Phoenician merchandise in every harbor town. The very garment which the Greek townsman wore he called by a Phoenician name (*chiton*) as he heard it from the Oriental traders along the harbor shores. As he continued to receive these products of Oriental art and industry, the Greek slowly learned the craftsmanship that produced these things. Indeed there is every indication that there were plenty of Phoenician workshops on Greek soil. Meantime the Phoenicians or their kindred the Arameans had long since devised an alphabet, based on Egyptian writing, and were thus employing the first system of writing made up exclusively of alphabetic signs.²⁸ Continuous business intercourse with the Phoenician craftsman and merchant naturally impressed upon the Greek what a great convenience the Phoenician possessed in his written records of business. Thumbing the Phoenician's papyrus invoices, the Greek tradesman eventually learned the meaning of the curious alphabetic signs, and then began to use them himself for the writing of Greek words, employing some of the

²⁸ The origin of the so-called Phoenician alphabet and its transmission to Greece form a difficult problem, far more complicated than the above simple statement would indicate. The solution of the problem has been greatly furthered by the discovery of a new script in Sinai, which has been brilliantly employed by Alan. H. Gardiner, "The Egyptian Origin of the Semitic Alphabet," *Journ. of Egyptian Archaeol.*, III., Part I. (Jan., 1916), with additional observations by A. E. Cowley, "The Origin of the Semitic Alphabet," *ibid.* See also H. Schaefer, "Die Vokallösigkeit des phoenischen Alphabets," *Zeitschr. für aegyptische Sprache*, LII., 1915, 95-98; R. Eisler, "Entdeckung und Entzifferung kenitischer Inschriften aus dem Anfang des zweiten Jahrtausends vor Christo im Kupferminengebiet der Sinaihalbinsel," *Biblische Zeitschrift*, XV., 1918, 1-8; K. Sethe, *Nachrichten der kgl. Goett. Gesell. der Wissensch., Phil.-histor. Klasse*, 1917, 437ff.; and Breasted, "The Physical Processes of Writing in the Early Orient and their Relation to the Origin of the Alphabet," *American Journ. of Semitic Languages*, XXXII., 1916, 230-248.

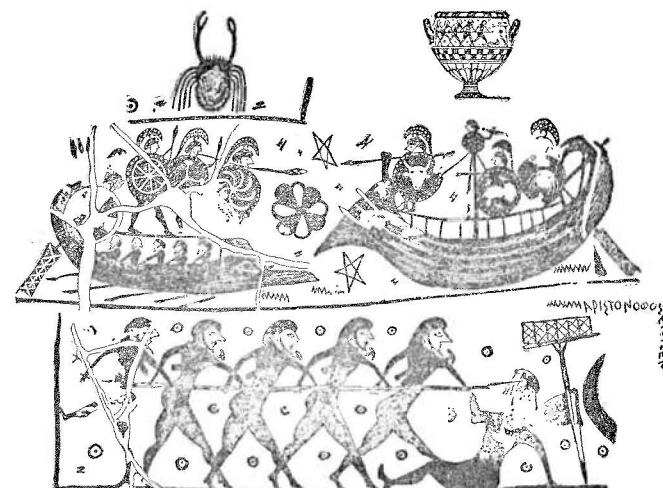


FIG. 117. PAINTINGS ON AN ARCHAIC GREEK VASE SHOWING THE EARLIEST KNOWN SIGNATURE OF A GREEK VASE-PAINTER. The vase-painter's signature is at the extreme right end at the top of the lower row. It reads "Aristonothos made it," and dates about 700 B.C., at a time when the Greeks were just learning to use Phoenician writing.

signs as vowels, which were not represented in the Phoenician alphabet.

By 700 B.C. the Greek potters were writing their names, like trademarks, on the vases they produced (Fig. 117). But the Greeks soon found the Egyptian paper offered them by the Phoenician merchants of Byblos the most convenient writing material, and they called it *byblion* or *biblion* after the Phoenician port from which it came, as we call Chinese porcelain "china" or rich textiles originally from Damascus "damask." This word gave rise to the various words for library used by a large part of Europe, like the French "bibliothèque"; and our

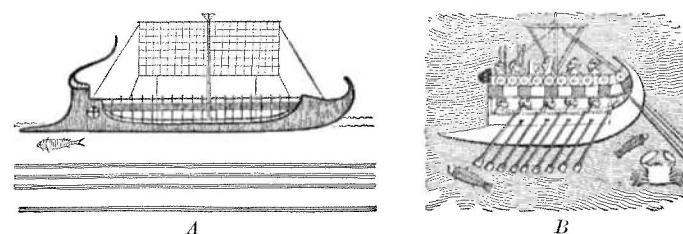


FIG. 118. AN EARLY GREEK SHIP (LEFT) AND THE PHOENICIAN SHIP FROM WHICH IT WAS MODELED (RIGHT). After the 15th century B.C. the Phoenicians seem to have introduced a change in the earlier model of their ships (Fig. 116), altering the high bow into a beak which was below the surface of the water. Whether this change was of Phoenician origin or not is a little uncertain. The Phoenician model above (right) is from a relief of Sennacherib, showing that the Assyrians adopted Phoenician shipping, as did the Persians also. A large proportion of the Persian ships at Salamis were Phoenician. (From the author's "Ancient Times," by permission of Ginn & Co.)

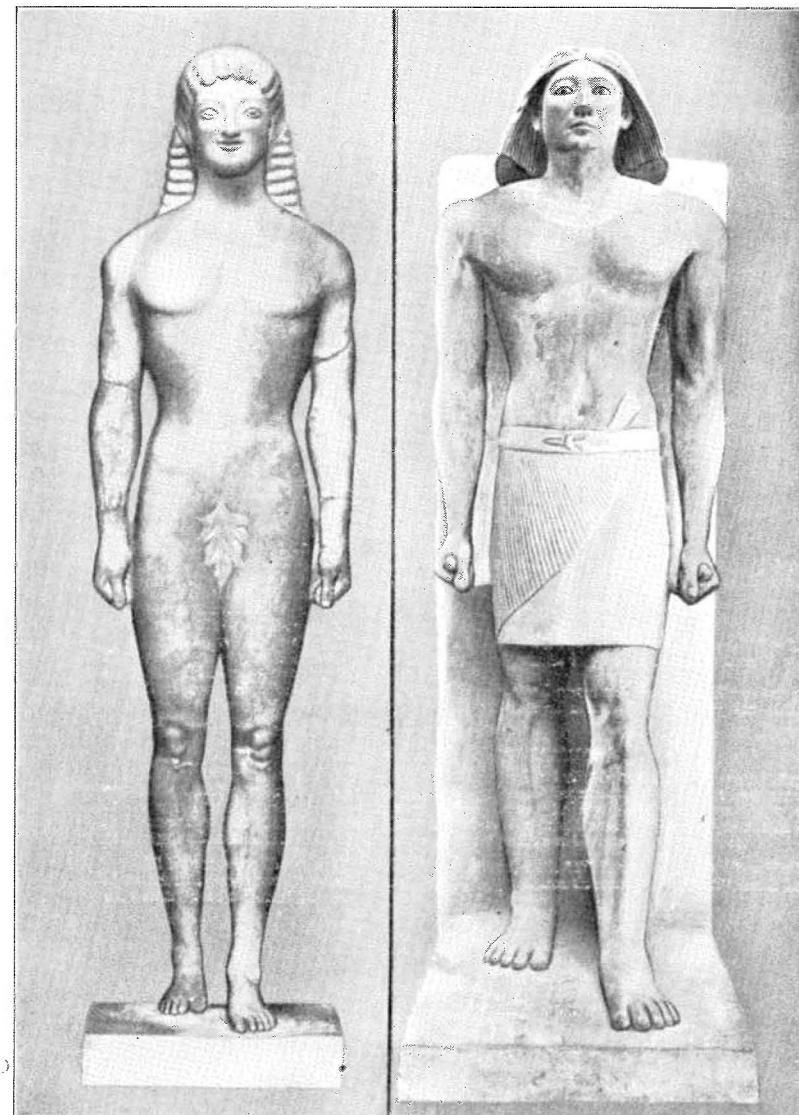


FIG. 119. ARCHAIC GREEK STATUE AND EARLY EGYPTIAN STATUE BY WHICH IT WAS INFLUENCED. The similarity, or we may say actual identity of posture, even including the left foot thrust forward, shows clearly that this archaic Greek sculpture grew up under Egyptian influence. (From the author's "Ancient Times," by permission of Ginn & Co.)

own word "Bible." Another word then commonly used for Egyptian paper was "papyrus," which with loss of the classical ending "us," and change of a single vowel has given us our word "paper." Thus after the destructive Greek invasion had crushed out the earliest literary culture that had arisen in Europe, both writing and its physical equipment were again

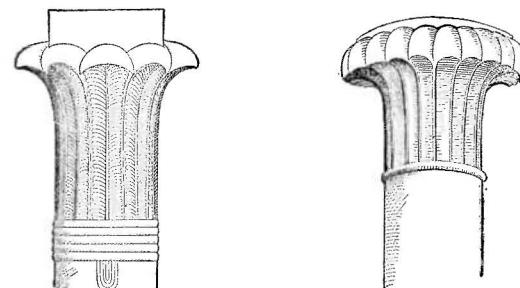


FIG. 120. EGYPTIAN PALM CAPITAL AND HELLENISTIC PALM CAPITAL COPIED FROM IT.
(From the author's "Ancient Times," by permission of Ginn & Co.)

introduced into Europe from the Orient. Such contributions from Oriental life make it perfectly just to say that Europe was at that time receiving civilization from the Orient *for the second time*.

Meantime the Greeks had rapidly learned shipbuilding and navigation from their Phoenician competitors (Fig. 118). In doing so they adopted a new Phoenician model with beaked prow, quite different from the old Aegean model from Egypt (Fig. 84) with both ends turned up. This again illustrates how little of the old Aegean culture had been able to survive the Greek invasion. As the Greek maritime ventures extended to all ports of the eastern Mediterranean, Greek merchants and gradually also Greek travelers, came into direct and first-hand contact with the vast fabric of civilized life in the Near Orient, especially after 600 B.C. The travels of Solon, Hecataeus, Herodotus and Plato will occur to every reader. It should be remembered that in the times with which we are dealing the Greek citizen could walk entirely across a town like Athens or Ephesus in five or six minutes, and there was not a Greek city in existence which could not be traversed from edge to edge in ten minutes or less. When the Greeks first visited the Orient all Greek buildings, including the temples, were of sun-dried brick, and the supports or piers were of wood. As to statues, a wooden head surmounting a post draped with clothing was enough.

Under these circumstances it is not remarkable that archaic Greek sculpture shows unmistakable evidences of Egyptian influence (Fig. 119). The impression of the magnificent cities of Egypt and Asia upon the minds of travelers like Hecataeus and Herodotus was not exhausted in literary expression alone. Greek builders must likewise have seen these cities and added definite impressions as well as sketches to the vague references to the splendors of the Orient with which all Greeks were

familiar in the Homeric poems. Greek architecture then responded sensitively and promptly to the tremendous stimulus of the vast architectural monuments of the Orient. Such tangible examples as the Egyptian palm capital, which we found in the pyramid temples in the twenty-eighth century B.C. (Fig. 83), copied by the architects of Pergamum in later times (Fig. 120), show that the diffusion of Egyptian architectural forms Europeward is a clearly demonstrable fact. Such evidence raises beyond doubt the Egyptian origin of the Greek Doric column (Figs. 121-122). Puchstein long ago made perfectly clear the Oriental origin of the Ionic column, and to such determination of the Oriental source of the individual column, Doric and Ionic, it is of great interest to add also that of the arrangement of assembled columns around an interior court. Such a complex architectural creation is by no means an obvious concept, which could arise independently on both sides of the Mediterranean. The ancestry of the Hellenistic colonnaded court becomes perfectly evident when we place such a court, as found in a Pompeian house, side by side with the Egyptian architect's temple court of the twenty-eighth century B.C. (Fig. 123). It can not be doubted, either, that the Hellenistic architects received the idea of their clerestory hall, which they called a "basilica," from the great colonnaded clerestory halls of the Egyptian Empire temples (Figs. 94 and 95), which thus became the ancestors of the basilica cathedrals of Europe (Fig. 124).

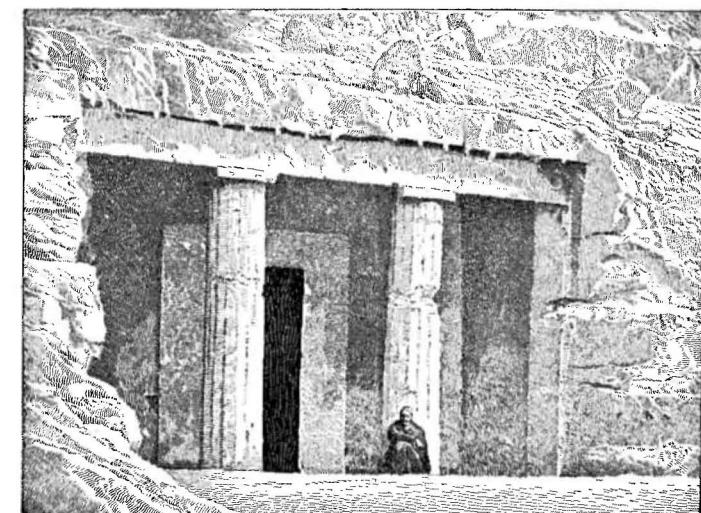


FIG. 121. FLUTED STONE PIERS OF AN EGYPTIAN TOMB AT BENI ASAN. (19th century B.C.) These piers, which the Egyptians never adorned with a capital, were the ancestors of the Greek Doric column (Fig. 122).

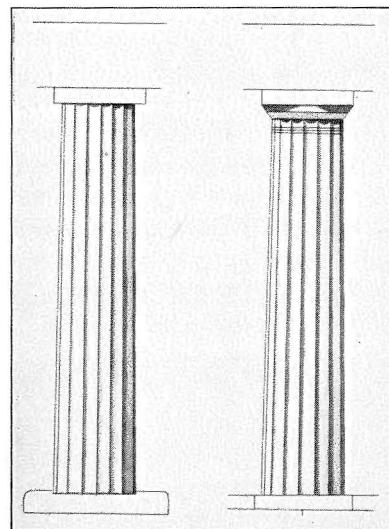


FIG. 122. THE OLD EGYPTIAN FLUTED STONE PIER AND THE GREEK DORIC COLUMN WHICH DESCENDED FROM IT. (From the author's "Ancient Times," by permission of Ginn & Co.)

Although it carries us chronologically far down the centuries, it is appropriate here to suggest a great architectural synthesis which I believe has not yet been made. The outstanding features of the Assyrian palace front, with its imposing central arch and lower arches on each side, were continued in the Parthian palace façade (Fig. 125, No. 2). It can not be doubted that Roman architects, seeing such structures in the Near East, drew the Roman triumphal arch from this source (Fig. 125, No. 3). Now when we recollect that in its nave and side aisles the clerestory hall presents a tripartite arrangement of floor, colonnades and roof, we see at once that the three arches of the old Assyrian palace front will answer to the front of the clerestory hall, part for part; the tall arch in the center corresponding to the high nave of the hall, while the smaller arches on each side correspond to the lower roof over the side aisles. In putting up a Roman triumphal arch as the front of the basilica cathedral, the architects of Europe were combining ancient Asia and Egypt.

It is further of great interest to observe that the tower with which the Christian cathedral was eventually embellished was likewise derived from the East (Fig. 126). The Hellenistic architects had found the model of their great lighthouse tower at Alexandria, the Pharos, in the old Sumerian temple towers of Babylonia. From such towers both Islam and Christianity

finally drew the spires with which they adorned their sacred buildings. Thus Christianity, itself of Oriental origin, was housed in great sanctuaries, the fundamental elements of which had likewise come out of the East.

In a sane historical and cultural consideration of the career of man such indebtedness of Greek civilization to the Orient does not in the least detract from the unchallenged supremacy which the splendor of Greek genius triumphantly attained as the sixth century B.C. advanced. To recognize this indebtedness is but to acknowledge the operation of the same cultural processes in the Aegean, which must inevitably have been operative, because there were no reasons why the Greeks should be any more impervious to external influences than any other group of peoples. The Greeks were to be the first ancient people to gain complete freedom of the mind from traditional conceptions, and were thus to make intellectual conquests far surpassing the achievements of the Orient in the world of mind; but even in this realm they were not without their debt to the

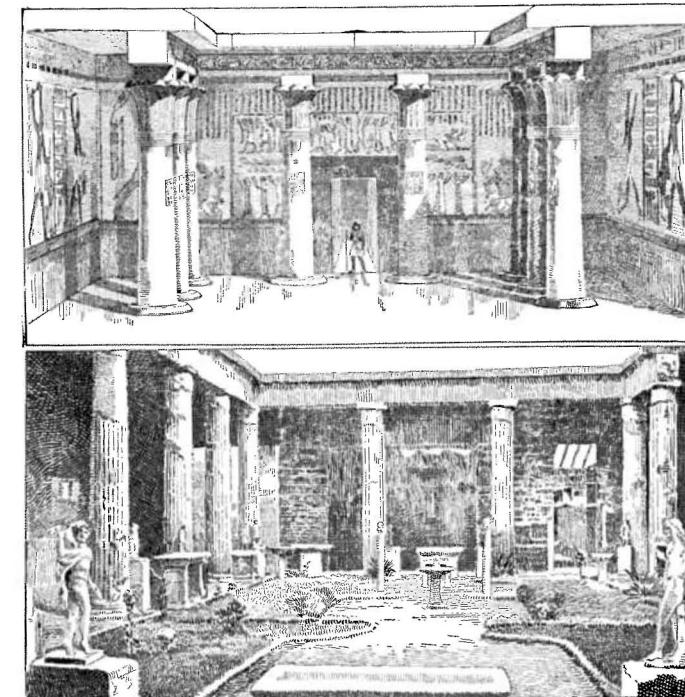


FIG. 123. THE ORIENTAL ANCESTRY OF THE EUROPEAN COLONNADED COURT. Above is the court of the temple of Sahure (Fig. 83), and below the court of the house of the Vetii at Pompeii, a building drawn from Hellenistic models in southern Italy. (From the author's "Survey of the Ancient World," by permission of Ginn & Co.)

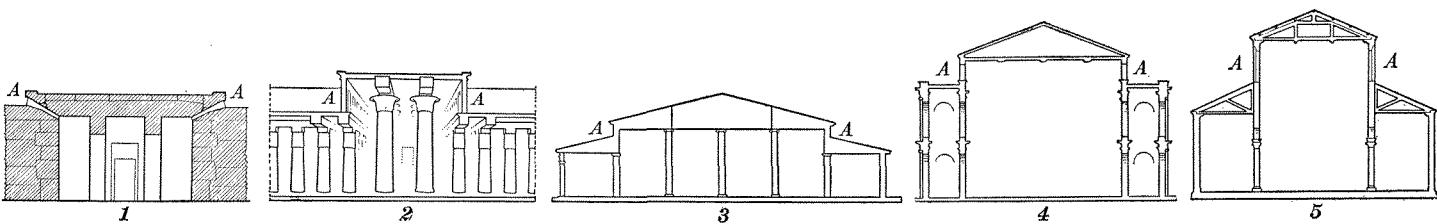


FIG. 124. DIAGRAM SHOWING THE ORIGIN OF THE CLERESTORY AND THE BASILICA HALL. The oriental ancestry of the basilica church is here evident. No. 1 is the earliest clerestory hall at Gizeh (29th century B.C., Fig. 79); no. 2 is the great Karnak clerestory hall (13th century B.C., Fig. 95); no. 3 is a Greek basilica hall of the third century B.C., showing the sloping roof necessary in a rainy country (Egypt being rainless); no. 4 is the Basilica of Julius Caesar at Rome (first century B.C.); and no. 5 is a Christian basilica cathedral of the fourth century of the Christian Era. (From the author's "Ancient Times," by permission of Ginn & Co.)

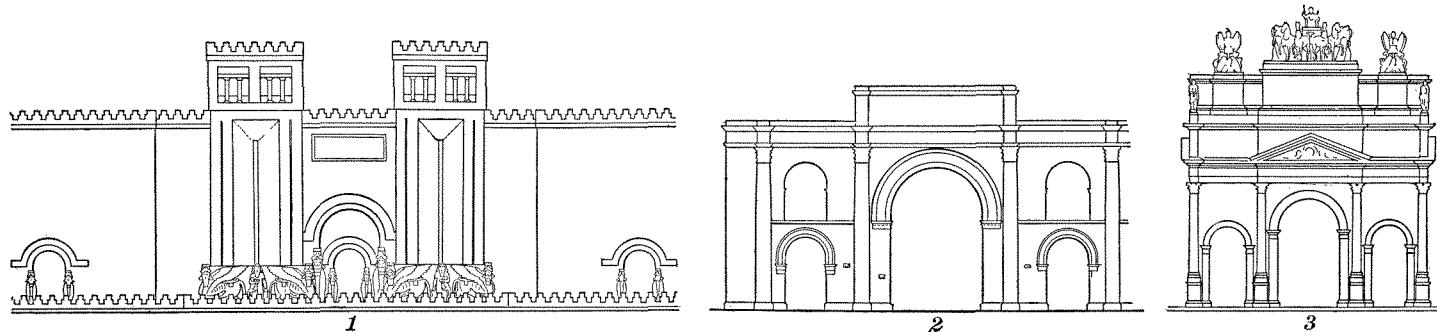


FIG. 125. THE ORIENTAL ANCESTRY OF THE ROMAN TRIUMPHAL ARCH. No. 1 is the Assyrian palace front (Fig. 111); no. 2 is a Parthian palace façade; and no. 3 is a Roman triumphal arch. (From the author's "Ancient Times," by permission of Ginn & Co.)

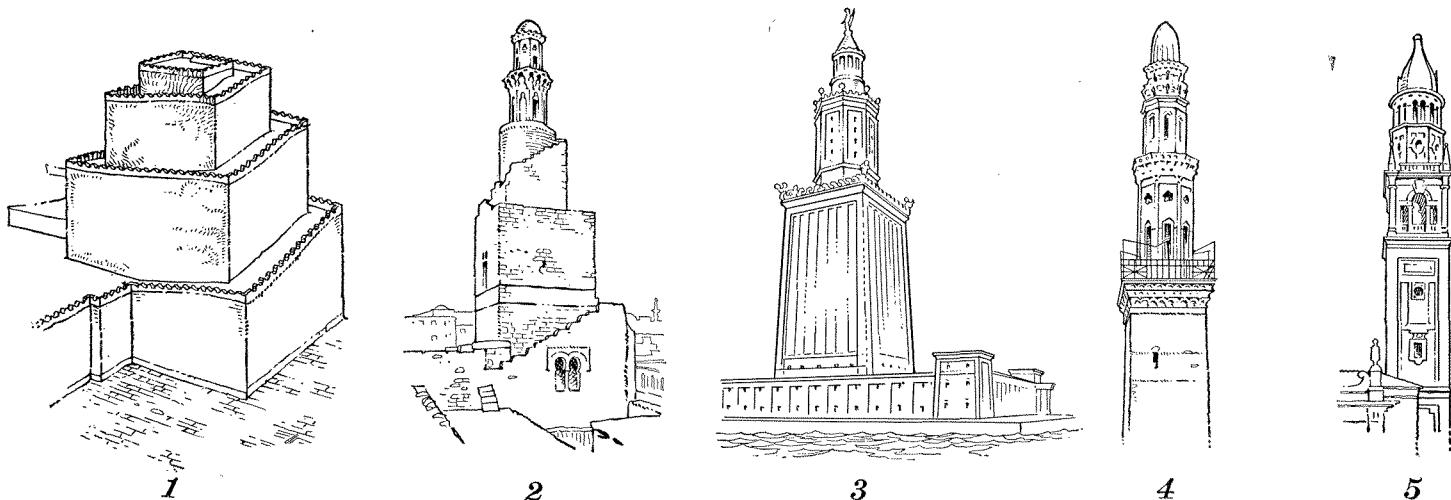


FIG. 126. THE ORIENTAL ANCESTRY OF THE TOWER IN WESTERN ARCHITECTURE, ESPECIALLY THE CHRISTIAN CHURCH SPIRE. No. 1 is the old Sumerian temple tower of Babylonia (Fig. 105); no. 2 is the minaret of the Mosque of Ibn Tulun in Cairo (ninth century A.D.), which still displays the winding ascent or ramp around the rectangular tower; no. 3 is a restoration of the Hellenistic lighthouse tower at Alexandria (third century B.C.; after Thiersch). Both nos. 2 and 3 display at the top a hexagonal member which forms the transition to a circular section crowning the whole. This is also found in early minarets of Western Asia, with a spiral ascent, as at Samarra. No. 4 is a minaret from an Egyptian mosque, while no. 5 is the spire of the church of St. John at Parma, Italy. Both display the hexagonal and circular members at the top. (From the author's "Ancient Times," by permission of Ginn & Co.)

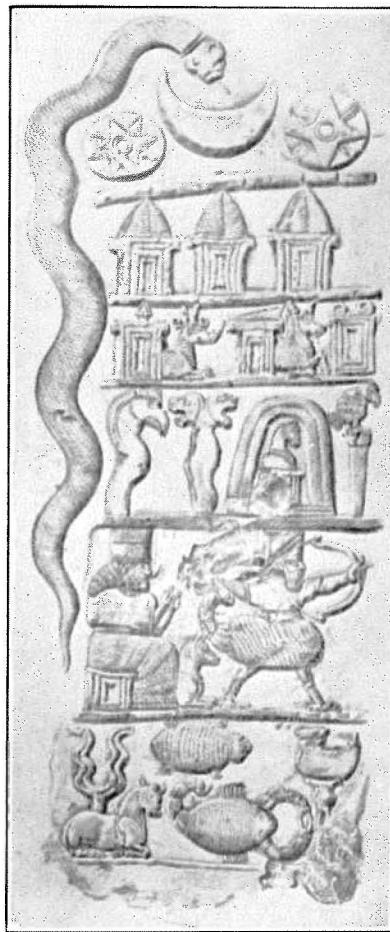


FIG. 127. A BABYLONIAN KUDURRU, COMMONLY CALLED A BOUNDARY STONE, BEARING EMBLEMS OF THE GODS: among them are signs later appearing in the zodiac like the scorpion and the archer.

accumulated knowledge of the natural world which they received from the Orient.

While we have thus followed the great drift of civilized influence as we can discern it especially in monumental forms which have come out of the Orient into the West, we have found that these things suggest influences less material and not so easily exhibited in visualized forms; just as the cathedral architecture of Europe, drawing its fundamental forms from the Orient, suggests the Oriental origin of the religion which it housed.

Among intellectual influences which the Greek traveler felt as he visited the Orient nothing attracted him more than the

knowledge of the future which the Babylonian priest gained by observation of the celestial bodies. As we shall see, the Babylonian observer of the heavens did gain knowledge of the future, but not knowledge of the future of human affairs as he supposed and as he assured his Greek visitors. Astral religion among the Babylonians, already in the third millennium B.C. had led them to believe that they could read the future in the anticipatory movements of the heavenly bodies. They early noted the difference in the character of the planets and the fixed stars, and they began to group the latter into constellations associated with signs such as we see on the so-called boundary stones where the scorpion and the centaur already appear among the symbols of divinities invoked to protect the title of a land-owner (Fig. 127). But there was at first no comprehensive system of the skies, including all twelve of the signs of the zodiac.

Far down into the last millennium before Christ the observations made by the priests were solely for astrological purposes. They were crudely done and furnished but very vague data. Eclipses observed long after 1000 B.C. are not even accompanied by a note of the year, while the hour, if added, will be noted as one of the three watches of the night—watches which were not of fixed length. The claim that the Babylonians of the third millennium B.C. already knew of the precession of the equinoxes has been completely disproven.²⁹

Only in the last seven centuries before Christ did the Babylonians pursue the study of the heavens for chronological purposes. A large body of astronomical tablets of this period show no indication of an astrological purpose. For the first time they contain observations including the data for both time and space, and with the inclusion of these elements astronomical science began.

The tablets of this age are of two classes, *observational* and *computational*. While the *observational* tablets deal incessantly with sun and moon and the relative positions of the two, they record especially the positions of the planets. This is done by noting each planet's position with reference to the fixed stars, but at first entirely without angular measurements, and if the planet was not far to the east or west of the fixed star, the position of the planet would be indicated by the phrase, "at the place" [of star so-and-so]. Later (especially the last four cen-

²⁹ See the work of the able Dutch astronomer-orientalist, F. X. Kugler, "Sternkunde und Sterndienst in Babel"; on this careful survey of Babylonian astronomical documents the above sketch is chiefly based.

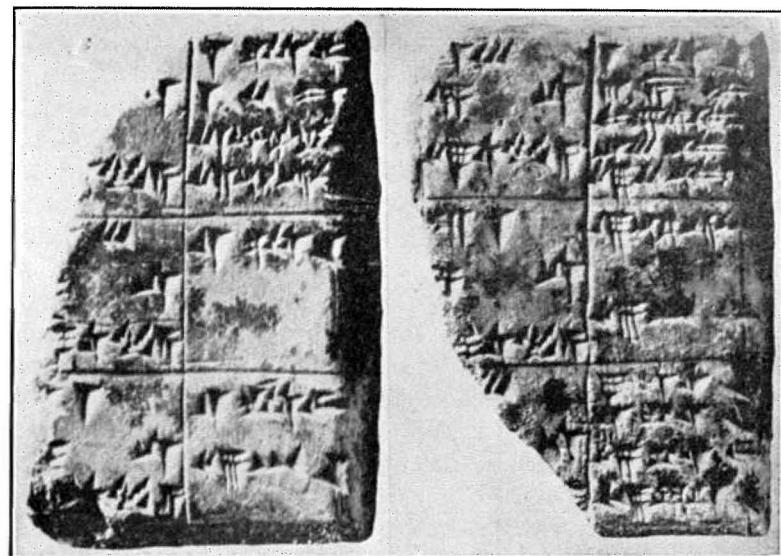


FIG. 128. CLAY TABLET PAGES FROM A BABYLONIAN ASTRONOMICAL ALMANAC FOR THE YEAR 425 B.C. (= Astr.-424) NOW IN THE MUSEUM OF THE UNIVERSITY OF PENNSYLVANIA.

turies B.C.) angular measurements were made in "cubit-degrees and inches" (Kugler). These observations resulted in the discovery of the eighteen-year lunar period, which the Greeks called "Saros," and with the aid of these the priestly astronomers constructed the first tables of the conjunction of sun and moon (syzygy tables).

Such observations also enabled the priestly astronomers to determine with astounding accuracy the synodic revolutions of the planets. In a region of wonderfully clear skies during eight months in the year, they were able to study even Mercury, which we rarely see, with such precision that by calculations based on his heliacal rising and setting they computed his synodic revolution as 115 days, 21 hours, 3 minutes and 50.9 seconds, a result which exceeds the computation of Le Verrier by only 16.3 seconds, while that of Hipparchus is in error by nearly a minute. In the computation of the mean synodic revolution of Jupiter, the Babylonian astronomers agreed with the results of Hipparchus within a fraction of a second.

In Fig. 128 we have before us a *computational* tablet of great interest, being the oldest such tablet as yet discovered. It is of a class called by the Greeks *ephemerides*, meaning the daily predictions of an astronomical calendar. This particular *ephemeris* is therefore a page from a Babylonian astronomer's

almanac computed for the year 425 B.C., the fortieth year of Artaxerxes I.

Each side of the tablet, obverse and reverse, is divided into two columns. In the *left-hand* column the astronomer has entered the monthly and lunar data: in the first line the length of the month, in the second the date of the full moon, and in the third the date of the moon's last visibility. There were thus three entries for each month. In the *right-hand* column a number of lines for each month predict the dates of the heliacal rising and setting of the planets and fixed stars. On the reverse, however, the column containing these predictions displays two additional predictions of the greatest interest. There are four entries for the month and they read as follows:

On the first Mercury rises.

On the third the Equinox.

Night of the 15th, 40 minutes after sunset an eclipse of the moon begins.

On the 28th occurs an eclipse of the sun. (Kugler.)

Kugler has calculated the dates of these two eclipses as having occurred on October 9 and 23, in — 424 (astronomical), that is 425 B.C. The eclipse of the moon on the ninth of October was visible in Babylon; but that of the sun was visible only below the horizon of the city, and these ancient Babylonian astronomers who predicted it, were unable to see it. They evidently did not know beforehand that they would not be able to see it, and it should be noted that they were not in position to calculate the extent or place of visibility of a solar eclipse. It is thus doubtful whether they understood the nature of an eclipse. They were, however, able to compute the positions of the celestial bodies years in advance, especially those of the planets, giving dates and longitudes.

Of the instruments used in these observations, on which these remarkable calculations were based, we know nothing; but, however crude they were, it is quite evident that the Babylonians were the founders of astronomy and meteorology, and their amazingly industrious and discerning labors are not only of the highest interest in the history of civilization, but they are even of value to modern astronomy in the study of the moon.

It was into a world of researches and of astronomical knowledge such as we have suggested, that Greek travelers like Herodotus penetrated when they visited the east end of the Mediterranean, and especially if they went as far as Babylon itself. That the Greeks learned their astronomy in the beginning from the Babylonians there is no longer the slightest doubt. Even the name of the Babylonian observer and astronomer, from

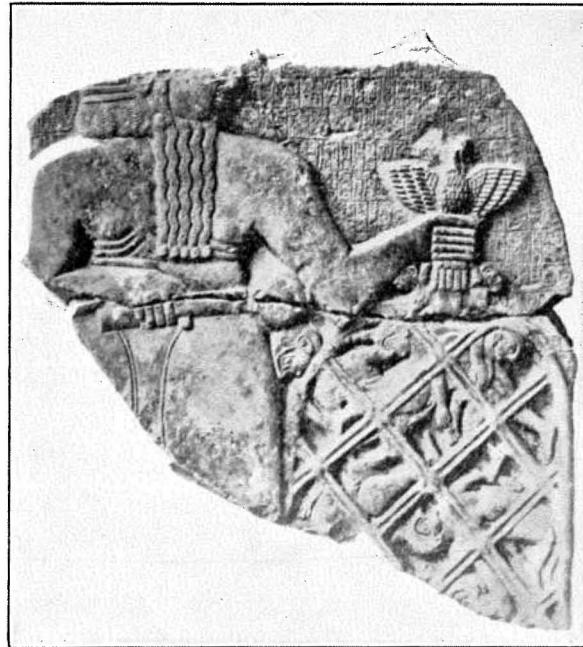


FIG. 129. NINGIRSU, GOD OF THE OLD SUMERIAN CITY KINGDOM OF LAGASH IN LOWER BABYLONIA, CARRYING AWAY THE ENEMIES OF HIS CITY IN A NET WHICH IS SURMOUNTED BY THE LION-EAGLE EMBLEM OF THE CITY. The emblem is the same as that found also in Figs. 102 and 103.

whose work the Greeks drew, has in one case been identified. A cuneiform tablet of moon data signed by the Babylonian astronomer Kidinnu is the work of him whom Strabo quotes as *Kidénas* and Pliny as *Cidenas*.³⁰

Next to science and religion and intimately involved in the latter, the most powerful influence from the Orient has been the ancient tradition of the state and the place of the ruler and the god in it. It is of especial interest to note this fact now at one of the greatest moments in the history of man, when the last surviving traces of the Oriental conception of the ruler and the state have suffered destruction.³¹

³⁰ Bezold, "Astronomie, Himmelsschau und Astrallehre bei den Babylonier," *Sitzungsber. d. Heidelberger Akad. d. Wissenschaft., Phil.-hist. Klasse*, 1911, 2. Abhandlung, p. 16, quoting from Schiaparelli; Cumont, "Florilegium de Vogué," pp. 159ff; and *Neue Jahrb. f. d. klass. Alt.*, 1911, XXVII., p. 8; and Kugler, BB. 122. A large mass of quotations from the cuneiform originals has been identified by Bezold and Boll in the astrological treatises of the Greeks (*Sitzungsber. der Heidelberger Akad. d. Wiss., Phil.-histor. Klasse*, 1911, 7. Abhandl.: *Reflexe astrologischer Keilinschriften bei griechischen Schriftstellern*).

³¹ The following paragraphs to the end are adapted from the author's

On one of the early Sumerian monuments of Babylonia (Fig. 129), we see the god of the Sumerian city-kingdom of Lagash bearing in his mighty grasp the heraldic symbol of the state, surmounted by the eagle which was yet to cross lands and seas to become the American eagle: yonder the symbol of an Oriental autocracy, here that of a liberty-loving Western democracy. This scene, in the transparent symbolism of the Orient, epitomizes the early Oriental polity, picturing to us the victorious state upheld in the guiding and protecting hand of the god who was its head. Now this is of course a purely ideal scene—one that never existed except in sculpture.

It was possible, however, to express the same relationship between the god and the state in an actual scene, by employing a symbol of the god instead of a symbol of the state, and by putting this symbol of the god into the hands of a human representative of the state. By so doing the Oriental believed without qualification that he was thus introducing the potent presence of the god into earthly scenes and making him effective in earthly crises. In sculptured representations of the battle array, we find the Egyptians mounting a symbol of their god Amon in a chariot and driving with it into the midst of the fray (Fig.



FIG. 130. SYMBOL OF THE GREAT GOD OF THE EGYPTIAN EMPIRE AMON MOUNTED IN A CHARIOT READY TO BE CARRIED INTO BATTLE LIKE A MODERN FLAG.

discussion: "The Eastern Mediterranean and Early Civilization in Europe," Annual Report, Am. Hist. Assn., 1914, pp. 103ff.



FIG. 131. SYMBOL OF THE GREAT GOD OF THE ASSYRIAN EMPIRE ASSUR MOUNTED IN A CHARIOT AND CARRIED INTO BATTLE LIKE A MODERN FLAG.

130), believing that the god was thus actually present and assisting in the conflict. We recall the similar use of the sacred ark of the Hebrews, which they sent into battle against the Philistines. The Assyrian sculptures exhibit the same custom (Fig. 131). When in camp the Assyrians housed their battle symbols of the god in a tent shrine, where the chariot bearing them stands in one corner, and priests minister to them as to the god of the state whose visible presence makes victory certain (Fig. 132). Such a custom was purely Oriental. The eagle standard of Jupiter Optimus borne at the head of the Roman legion can hardly have had any other origin.

Similarly we remember how Constantine later, thinking to honor the newly triumphant Christian faith, made a battle standard bearing a symbol of the Christ at the top, and this standard led the troops into battle. He too had a portable tent shrine for this standard, with daily ministrants attending upon it. Was it merely an accident that that Emperor who in the present war thought to possess Constantine's city and conquer the East in whose lore he was steeped—was it merely an accident that this Emperor continually reminded his troops that the power of divinity went with them in every battle?

This visible leadership of the god in the crisis of battle in the ancient Orient, was but one function in his guidance of the Oriental state. For the god was the source of the king's legal authority as the head of the state, and I know of no monument of the early East which so forcibly pictures this concept of the state as the sculpture surmounting the shaft which bears the

laws of Hammurapi (Fig. 133). In this noble relief scene the Babylonian king at the left is depicted receiving from the god enthroned at the right the great code of laws which is engraved in thirty-six hundred lines around the shaft supporting this relief. The king thus receiving the law from the god enters into an intimate coalition, which makes the sovereign the infallible representative of the god, a representative whom no mortal would venture to challenge.

We have here a state which is a divine institution administered by a ruler who is the recognized agent of divinity. Of the Holy Roman Empire, in his volume on that subject, Lord Bryce remarks: "in order to make clear out of what elements the imperial system was formed we might be required . . . to travel back to that Jewish theocratic polity, whose influence on the minds of the medieval priesthood was necessarily so profound" (3d ed., p. 3). Had this distinguished historian's studies carried him back into the remoter reaches of the ancient Orient he would of course have recognized at once that what he calls "Jewish theocratic polity" was in fact only a very late manifestation of a conception of the state already wide-spread in the early East thousands of years before the Hebrew theocratic monarchy arose.

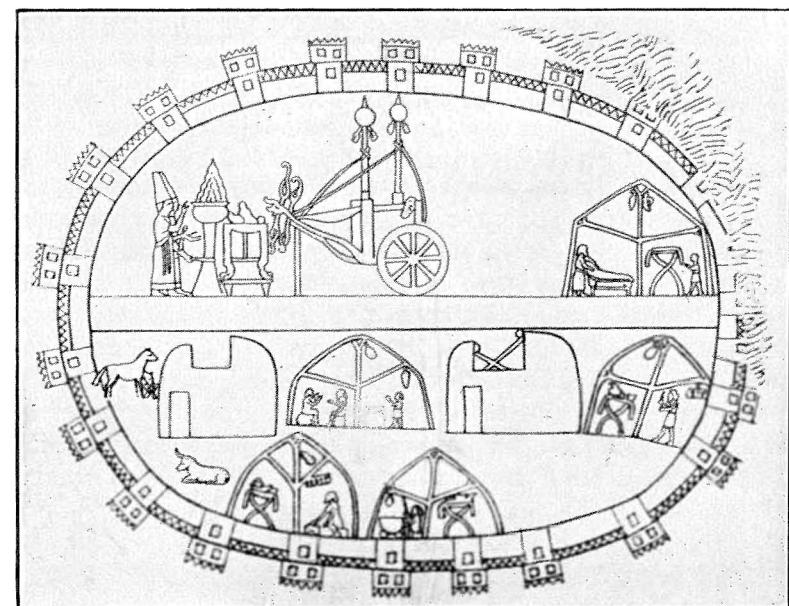


FIG. 132. FIELD SHRINE OF THE PORTABLE BATTLE EMBLEM OF ASSUR, WITH PRIESTS MINISTERING BEFORE IT AS TO THE GOD HIMSELF.



FIG. 133. HAMMURAPI THE GREAT KING OF BABYLONIA RECEIVING THE LAW FROM THE SUN-GOD. (21st century B.C.) The king is at the left shrouded in a long garment. The god at the right is enthroned on a mount as suggested by the stones under his throne. The flame emblems rising from his shoulders show his character as a solar deity. The relief surmounts the shaft which bears his great code (Fig. 108).

Men who believed in such a state accepted absolute monarchy as a matter of course, and never raised the question or entered upon a discussion of the proper form of state. We can not here follow the course of this conception of the state as along with many other elements of the great fabric of Oriental civilization it entered Europe in the train of Alexander's conquests and, passing through the Oriental despotism of the Byzantine emperors, infected all Europe with the doctrine of the divine right of kings. In the person of the ablest and the most guilty of the fallen European sovereigns, a ruler who persistently proclaimed his belief in his own divine right—in the person of this ruler we of this generation have been watching the final and complete destruction of an ancient Oriental concept of the state and the sovereign.

But this hoary Oriental concept of the state, although much modified by democratic tendencies, did not stop on the other

side of the Atlantic. Its influence was still felt in the New England town-meeting, which was as much a meeting of the church as it was of the town; and our pilgrim forefathers little dreamed that in the distant vista behind the venerable figure of Moses dominating their assemblies, there loomed the remote and colossal shadows of Cheops and of Hammurapi.

The reader will have discerned that the culture forces issuing from the birth-lands of civilization, which we have termed the Egypto-Babylonian group, have continued their profound influence on Western life, even down into our own day—a fact which is especially evident in the great historical religions, Judaism and Christianity. The particular purpose of these lectures, however, has been to reach much further back than is done by the historian, and in so far as such a slender sketch would permit, to marshal some of the more graphic and outstanding evidences which permit us to trace the rising life of man from the cave hunters of France and Spain in the Paleolithic Age, some ten or twelve thousand years ago, to the emergence of great civilized societies in the Near Orient, and the transmission of civilization from such communities to the shores of Europe beginning five thousand years ago. Even before the civilization of the Near East had been made possible by the development of writing and metallurgy, Europe had received cattle and grain from the Orient, as indispensable preliminaries to civilization (Fig. 134, first bracket). After the first transition of civilization from the Nile valley to southeastern Europe (Fig. 134, second bracket), the destructive invasion of the early Greek barbarians crushed the earliest civilization of Europe so that not even writing survived. The development of the Greeks was therefore accompanied by a second transition of civilization from the Orient to Europe, this time

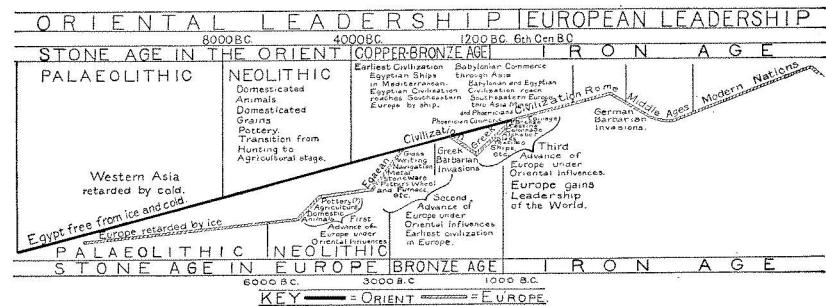


FIG. 134. DIAGRAM VISUALIZING THE RISE OF CIVILIZATION IN THE ORIENT AND ITS TRANSITION THENCE TO EUROPE.

from the entire Egypto-Babylonian group (Fig. 134, third bracket). But Hellenic genius never permitted the Greeks to remain merely passive recipients of culture from without. Building on foundations largely Oriental, they erected a splendid structure of civilization which nobly expressed their marvelous gifts, and brought them an unchallenged supremacy which was already evident in the sixth century B.C. The leadership in civilization then passed finally and definitely from the Orient to Greece. In recognizing this fact we have reached the culmination of that vast synthesis which we are the first generation of men to be able to make—a synthesis which enables us to trace the developing life of man from a creature but little superior to the simians, through unnumbered ages of struggle and advance, leading us from the cave savages of southern France through the conquest of civilization in the Orient, its transition to Europe, and thus through the supreme achievements of Greek genius, to the highly developed life of man at the present day.