Recent Discoveries in the Egyptian Faiyum and Sinai

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University of California African Expedition

THE EGYPTIAN PHASE OF THE University of California African Expedition under the direction of William B. Terry, expedition field executive, arrived at Alexandria on August 28 through the courtesy of the U. S. Navy.[1] During the following 6 months of operations in Egypt two subsequent ships unloaded additional scientists and equipment, giving the Egyptian Phase a total of 27 scientists and technical experts, exclusive of local personnel, and in addition, an airplane, motor boat, and 13 motor vehicles.

The specific objectives in Egypt were varied and depended to a great extent upon the geographic localities involved and specialized personnel available to conduct the extensive programs in paleontology, physical anthropology, prehistoric and historic archaeology.

The varied scientific programs have been made possible by the constant support and technical excellence of the following members of the expedition: Ahmed Lutfi, representative of the Service des Antiquités; Gladys Terry, business manager and secretary; Capt. G. G. Edwards, USMC, Chief of Motor Transportation; Dr. Rodman Wilson, MCR, USNR Physician; M/Sgt. Charles B. Evans, USMCR, motion picture photographer; M/Sgt. James Houle, USMC, Motor Transportation; Capt. George Russel, USA geographer; David Cohen, scientific and technical assistant; and Walter Thompson, technical assistant.

Faiyum Desert Programs

Paleontology. The paleontological program was conducted by Robert Denison, curator in the Dartmouth College Museum; P. Deraniyagala, director, National Museums of Ceylon; V. L. VanderHoof, professor of geology, Stanford University; and H. B. S. Cooke, senior lecturer in geology, University of the Witwatersrand.

The program in vertebrate paleontology was initiated with a reconnaissance trip into the desert area north of the Faiyum depression, at which time a practicable route of ascent up the steep escarpment of Eocene beds near Qasr el-Sagha was found. The Oligocene beds above the escarpment were examined over a wide area and some of the bone pits of earlier expeditions located.

A second reconnaissance trip involved a more careful study of the lower Oligocene Qatrani beds and confirmed the views of Beadnell (1905) that the upper part of the Oligocene fluviatile deltaic and marine beds was relatively barren of fossils, and that abundant vertebrate fossils were found only in one bed near the base of the series, associated with numerous silicified tree trunks. The earlier parties of Beadnell, Margraf, and Granger had apparently rather effectively cleared the whole region of surface fossils, and it was eventually decided that an area in which these parties had already worked extensively still offered the best prospect for further excavations.

After the expedition headquarters had been moved from the Egyptian government's excavation house near the pyramids of Giza to Kom Aushim (ancient Karanis) near the Faiyum, daily collecting trips were made to the Upper Eocene Qasr el-Sagha beds. This produced a fair collection of moeritherium, sirenian, crocodilian, and fish material with a good stratigraphic sequence of invertebrates.

Field camp was established near the old bone pits about 8 miles W.N.W. of Qasr el-Sagha. Since these beds had not been worked for nearly 40 years, it was thought that they would be productive to further collecting. It soon appeared that this was not the case. Erosion is almost entirely subaerial and is extremely slow because of the protective mantle of desert rubble. Careful prospecting and a large number of exploratory trenches finally revealed one large and one small deposit of bones which were excavated as far as practicable. These apparently accumulated in pools in the flood plain or delta of a large stream. It is possible that the pools were formed through blocking of the stream flow by the

[1] The author wishes to express his appreciation in the name of Dr. Robert Gordon Sproul, president of the University of California, to his Majesty, King Farouk I, to His Excellency Nokrashi Pasha, the Prime Minister, and to General Abd el-Hamid Bey Zeki, the Governor of Sinai, for their generous cooperation, assistance, and personal interest in all the activities of the expedition.

The southern phase of the University of California African Expedition, which is operating in South and Southwest Africa under the supervision of Charles L. Camp, director of the Museum of Paleontology, University of California, includes the following specialists (all from the University of California with the exception of George P. Barbour): Frank Peabody, paleontologist; Edwin M. Loeb, ethnologist; Mrs. Laura Bolton, musicologist; Charles Camp, Jr., assistant musicologist; Thomas Larson, research associate in zoology and archaeology; Robert Rodin, botanist; Brois Iflund, psychologist; and George P. Barbour, geomorphologist (professor of geology, University of Cincinnati).

large tree trunks which occur so abundantly in this bed. The fauna includes fishes, crocodiles, and turtles which lived in the stream, a large variety of mammals which must have been washed downstream, and a few sharks and rays which may have lived in the estuary and come upstream at times. The pits and surface finds furnished a good representation of the fauna, which includes among the mammals hyracoids, anthracotheres, hyaenodonts, proboscideans, and *Arsinotherium*. The area near the pits was geologically mapped at this time.

Work was planned for the Lower Miocene beds at Maghra, 135 miles west of Cairo, from which *Dryopithecus* has been reported. Owing, however, to the presence of land mines in this area, the project had to be abandoned.

In the area 60 miles W.S.W. of Kom Aushim, called "Zeuglodon Valley," numerous remains of *Prozeuglodon* and *Dorudon,* primitive whales, are to be found in the Upper Eocene Birket Qarun Series. Skulls and skeletal remains of both genera were collected, as well as elasmobranch, turtle, and invertebrate material.

A brief reconnaissance trip was carried out in the area from the southern end of the Wadi Natrun (half way between Cairo and Alexandria) into the Wadi el-Farigh in the hope of collecting Miocene and Pliocene vertebrates. Exposures were found to be poor and bone too scarce to encourage vertebrate collecting, except possibly in conjunction with an extensive stratigraphic survey of the area westward to Maghra Oasis, and time did not permit such an undertaking on this expedition.

Upon the completion of the Faiyum program, the Paleontological Section of the expedition in Egypt, under H. B. S. Cooke, began the overland journey through Upper Egypt and the Sudan and across Uganda to the second major headquarters at Nairobi, Kenya Colony.

Prehistoric archaeology. This program was conducted by S. A. Huzayyin, professor of geography at Farouk I University.

The Faiyum Depression forms an exceedingly interesting geographical unit, partially isolated by the surrounding desert, but formerly in direct contact with relatively dry grasslands and semideserts in Libya. In most periods it has also been connected by a waterway, natural or artificial, with the Nile Valley to the east. It has thus attracted much attention on the part of prehistorians and paleogeographers. More than 40 years ago Beadnell made a general geological survey of the Faiyum Depression, but devoted more time to the Tertiary than to the Quaternary. Attention was focused on the latter during the period between the wars by Sandford and Arkell, working on behalf of the Oriental Institute at Chicago, and especially by Misses Caton Thompson and Gardner.

It was decided that the expedition should start its investigations on the rather inaccessible northern border of the Depression, especially near the Qatrani Escarpment.

Sandford and Arkell had devoted themselves 20 years ago to the eastern side of the Depression and the Nile Faiyum Divide, while Caton Thompson and Gardner have emphasized the late Pleistocene and Recent physiography and archaeology of the lowest levels around Birket Qarun.

A large number of streamlet terraces were discovered in the Qatrani region, containing many flint implements which can be assigned definitely to the Upper Paleolithic, *i.e.* to the late Pleistocene. Altogether, 21 of these terraces and gravel deposits were studied and excavations to determine their formation and date carried out at a number of points. Fortunately, implements were discovered *in situ* in the terraces, and these can be assigned to the Upper Paleolithic.

Since only two or three of these terraces had previously been recorded at all (by Beadnell in 1902–05), the new material is not only far more abundant, but it can be dated much more correctly. Beadnell dated them as late Pliocene or Pleistocene. It is expected that careful study of the gravel deposits in question, as well as of the flint artifacts found in them, will throw valuable light on both the physiography and cultural evolution within the Faiyum Depression. It is already certain that the conclusions of Beadnell, as well as those of Sandford and Arkell, will have to be considerably modified on the basis of the much clearer picture which is now available of the chronology and physiographic development of the Faiyum Depression.

From an archaeological point of view, the industries discovered are also of distinct interest. From the middle of Upper Paleolithic onward, the Faiyum Depression was the center of a flourishing civilization which has more than one facies. A number of sites were located and excavated running from the Upper Paleolithic to the late Neolithic stages. When these archaeological finds are well studied, it is hoped that fresh and illuminating light may be shed on the evolution of the Neolithic of the Faiyum from Upper Paleolithic. It is possible that this may prove to be one of the first instances of a definite technological connection between the Paleolithic and the Neolithic cultural stages.

Physical anthropology. This program was conducted by Henry Field, former curator of the Field Museum of Natural History, Chicago.

Anthropometric data and measurements were recorded on 189 men at Tamiya, in the northeast part of the Faiyum. This village of about 9,000 inhabitants was selected for study because of its accessibility to Kom Aushim, the base camp, and because Dr. Saleh ed-Din, the local medical officer, was interested in research, spoke good English, and was anxious to collaborate. The subjects for examination were drawn mainly from the cotton-ginning plant. Photographs, both frontal and profile, were taken of the majority of the subjects and of a general series of villagers, especially children.

Shortly after the work began, it became desirable to have medical (particularly blood grouping and parasitological examinations), nutritional, and sociological collaborators in order to obtain a more accurate and broader picture of the community. Mohammed M. Sadr, biochemist in the Department of Nutrition, School of Medicine, Kasr el-Aini, approved this plan, and through Mezni Bey, in the Department of Public Health, it was proposed that a government mobile nutritional unit be sent to Tamiya for about 8 weeks to collaborate on the survey of Tamiya and thus to make it the key study for the Faiyum. Five days later the Minister of Public Health sent a nutritional unit to Tamiya—a record for speed and efficiency anywhere. Dr. Sadr supervised the work throughout the following two months, making at least biweekly trips to Tamiya from Cairo. As a result, 900 individuals were examined, 150 households analyzed in great detail, 180 blood samples taken, medical data recorded, a careful nutritional survey completed, and sociological notes recorded (by Sitt Fatma, since only a woman can obtain this type of material from the *fellahin* women). Dr. Sadr changed his staff of 6 midway through the study in order to eliminate the human equation and so that he could compare the two sets of results, sometimes from the same families. Fortunately, the two series showed a good degree of homogeneity.

As a result of this joint project at Tamiya a combined anthropometric-medical-nutritional-sociological survey has been completed. When the conclusions have been drawn, it should be possible to make certain definite recommendations for the improvement of the public health of Tamiya, which may well become the most envied village in the Faiyum. Furthermore, by its very example, Tamiya may be the means of improving the general health of the entire community.

About the middle of February a reduced number of measurements and observations were recorded upon 306 men in Fidimin, the garden village of the Faiyum. Thus, the total number of males measured in the Faiyum was 495, and about 650 racial-type photographs were taken.

Sinai Peninsula Programs

Prehistoric archaeology. The northern program was conducted by S. A. Huzayyin and the southern by Henry Field.

One of the major objectives for Sinai was to discover Paleolithic flint implements which might furnish a cultural link between Egypt and Palestine and, in a wider sense, between Africa and Asia. The importance of Sinai in this respect was always surmised, but never before were stone implements systematically searched for in this important area. Such a program was essential to settle such controversial points as whether certain cultures started in Asia and spread to Africa or whether Africa was their place of origin. In this respect it was fortunate that a series of open-air sites which had at one time been used as factories for flint tools was discovered. The most important of these flint mines, found at Rawafi, in the Wadi el-Arish in northeastern Sinai, had been exploited by man since the closing stages of the Lower Paleolithic (Acheuleo-Levalloisian) times. This new site at Rawafi, representing a large quantity of artifacts including hand-axes (*coups-de-poing*), is now one of the most important surface settlements in southwestern Asia and is the most important Paleolithic station yet discovered south of the Bethlehem area in the Sinai-Palestine Region.

Exploration of the northern part of the Tih Desert between Gebel el-Halal and the region of Suez yielded Upper Paleolithic flints in a number of areas, showing an interesting local industry with both African and Asiatic affinities. Isolated finds in northern Sinai included a site near Km. 115 from Ismailia with a large number of beautifully flaked microlithic lunates reflecting a Mesolithic culture which flourished between 8000 and 5000 B.C., again intermediate between already known flint industries in Egypt and Palestine. Since these were found within a small area, it was deduced that this must have been a flint-knapping site. It has been suggested that these microlithic crescents were tips for reed shafts which served as arrows.

After leaving Bir Hasanah and Nekhl, the expedition proceeded to the western coast of Sinai, where headquarters were established from December 24 to January 17 at Abu Zeneimeh.

A small rock shelter in the Wadi Khreze, off the Wadi Feiran, yielded late Chalcolithic tools and large basalt pounders, probably for use in the three turquoise mines some miles distant in the Wadi Ma-Kuttab. Trial trenches revealed that this shelter had been used not only by generations of ancient miners but also by recent nomads with their sheep and camels.

Near the entrance to the Wadi Ba'ba'ah, on a low flint-covered terrace bisected by a small dry stream, a remarkable Upper Paleolithic industry was discovered. This industry, of singular character, was contained in a 20-foot terrace near the junction with the Wadi Shellal.

An interesting series of stone picks was collected from the small wadis immediately north of Serabit el-Khadem. Flint implements, presumably for working the local sandstone, were also found in these wadis, washed from the Temple area in the now rare times of flood. It now becomes clear that the natives of Sinai had begun to mine turquoise here before the Egyptians took over the exploitation of the area themselves.

The implements represent typologically several phases from the Paleolithic to the Neolithic periods; those from nearest to the Nile valley show African affinities; those to the east, Asiatic links. Thus, Sinai is truly the ancient intercontinental zone of migration and the land bridge between Asia and Africa through which passed ancient man in various Stone Age cultural phases.

Historic archaeology. This part of the expedition, which was conducted by W. F. Albright, professor of Semitic languages, Johns Hopkins University, was fortunate in having the following Fellows of the American School of Oriental Research in Jerusalem added to its staff in southern Sinai: John C. Trever, Drake University; William H. Brownlee, Duke University; and William H. Beling, Princeton University.

One of the most significant new contributions from southern Sinai was the discovery of a small Egyptian seaport in the Merkhah region, south of Abu Zeneimeh. This seaport, situated only 100 meters from the water line and about 5 meters above the mean Red Sea level, had served as the outlet for ancient Egyptian mining expeditions from Serabit el-Khadem. Broken pottery was distributed over the surface, covering an area of 50×100 meters, and can be dated about 1500 B.C. or a very little later, in the period of Hatshepsut and Tuthmosis III. Soundings were made which clearly demonstrated that the debris of occupation had been almost completely removed by wind action.

In the recent past there has been much debate about the ancient shoreline of the Red Sea, both in the Suez and in the Aqabah region. The late Hermann Guthe and others tried to prove that, as a result of rise of the land or fall of the sea (presumably the former), the northern ends of the two gulfs and the adjacent coastlines ran much farther inland in early historic times than they do today. According to their view, the northern end of the Gulf of Suez was approximately at the northern end of the Bitter Lakes today, while the northern end of the gulf of Aqabah covered about a fourth of the road going north from the town of Aqabah to the Dead Sea.

Discovery of the ancient site of Tell el-Kheleifeh, near Aqabah, and its partial excavation in 1937–40 by Nelson Glueck, on behalf of the American School of Oriental Research in Jerusalem, demonstrated that the northern shore of the Gulf of Aqabah about 1000 B.C., when that site (Biblical Ezion-geber) was founded, was certainly where it is today (or even farther south), since Tell el-Kheleifeh is situated only a few meters above sea level and 550 meters from the sea. The work at Merkhah now proves the same thing for the northern part of the Gulf of Suez, even more strikingly, since the ancient site is lower, nearer the sea, and goes back at least 500 years earlier. It now becomes certain that the route of the Israelite Exodus, described in the Bible as passing from Rameses (San el-Hagar) through Pithom and Succoth (Tell el-Maskhutah west of Ismailia), cannot have passed through what we call the Red Sea but must have been farther north, through the body of water called "Lake (or Sea) of Reeds" in both Biblical and Egyptian records of the 13th Century B.C. (the approximate date of the Israelite Exodus).

The second significant contribution came from the study of the Egyptian turquoise-mining site at Serabit el-Khadem. Since many archaeological expeditions have studied the site for more than a century, this expedition did not expect to make any significant contribution during the short stay allotted. The explorations and excavations of Sir Flinders Petrie during the winter of 1904–05 seemed to have exhausted major possibilities, especially since three Harvard expeditions (1928, 1930, and 1935) had found only gleanings and two other expeditions had uncovered even less. However, in 1905 Petrie had discovered a number of very early alphabetic inscriptions in an unknown script at Serabit. Ten years later Alan Gardiner published them, proposing an interpretation of one or two words which was accepted by many other scholars and which formed the basis of nearly all attempts at decipherment during the past quarter-century. Gardiner thought that these letters represented the original symbols out of which all our later Semitic and European alphabets have developed. This original alphabet was, he believed, invented on the acrophonic principle, where the initial consonant of the name of the object denoted by the symbol was employed as the phonetic value of the symbol in question, e.g. a house is *bait* or *bet* in Semitic, and the picture of a house was accordingly taken to represent the consonant *b* (*beth* in Canaanite, *beta* in Greek). A very serious obstacle to correct decipherment has been the small number of inscriptions known and uncertainty as to their date and purpose. The first difficulty has been partly removed

by finds of additional inscriptions since 1905 (the last made in 1936). Petrie proposed a date for the inscriptions (about 1500 B.C.), but this was rejected by Gardiner and nearly all other later investigators. The recent investigations of the Sinai expedition have now definitely established the correctness of Petrie's date. On the other hand, previous investigators were definitely wrong about the function of most of the inscriptions, which are now shown to be mortuary (*i.e.* having to do with observances and practices connected with burials). Moreover, it has generally been assumed that the miners who wrote these inscriptions were local Bedouins, whereas mining experience has consistently shown that local Bedouins cannot be used as successfully in this kind of work as labor from sedentary agricultural regions. In antiquity, mining conditions were so bad that only conscripted or forced labor could be used. It now appears that the documents were written for mortuary purposes by miners from Canaan (pre-Israelite Palestine and Syria) in good Canaanite (now known from cuneiform inscriptions discovered for the most part since 1929). All of the inscriptions which are sufficiently well preserved can now be interpreted, and at least two-thirds of the characters can be identified, confirming Gardiner's acrophonic theory in the most striking way possible. The chief reason for previous failure is now evident: there was not enough evidence for grammar and vocabulary, and efforts to read the documents as Biblical Hebrew could not possibly succeed since they were actually written in Canaanite.

Although there are three short inscriptions from Palestine which are considered slightly older, these proto-Sinaitic inscriptions from Serabit el-Khadem form by far the oldest collection of documents in our own ancestral alphabet.

Physical anthropology. Henry Field, who conducted the physical anthropology program in the Faiyum Desert, also directed the program in Sinai.

One of the major purposes of the reconnaissance in Sinai was to collect anthropometric data on the Bedouins. Since there are few published figures (cf. Chantre) on these people for comparison with the nomads of southwestern Asia, every effort was made to obtain a series of individual measurements, observations, and photographs, all based on the Harvard system.

Anthropometric data were recorded on 223 males, including 73 Jebeliya, 29 Qararshe, 29 Sawalha, 23 Terabin, 22 Muzeina, 22 Tiaha, 12 Wulud Sa'id, and a few individuals from several tribes. The analysis of these statistics, including the morphological characters, and especially the front and profile photographs, will shed new light on the racial composition of the nomads of Sinai. As a result it will now be possible to make comparisons with the desert peoples of Syria, Trans-Jordan, and Iraq to the east, and certain groups already studied in Egypt to the west of Sinai, especially in Sharqiya Province. The Bedouins were extremely friendly and cooperative, the main difficulty in obtaining a large series lying in the fact that their tents are so few and far between.

A series of 19 skulls from one of the beehive tombs (*nawamis*) in the Wadi Solaf in southwestern Sinai were measured and photographed. After examination, they were replaced and the tomb resealed. In addition to these anthropometric data, tribal information was recorded and many photographs of Bedouin life were taken.

Tropical Medical Research

Immediately preceding the departure of the remaining section of the Egyptian Phase to the Sudan, under William B. Terry, additional members of the expedition arrived to conduct an extensive research program in the study of African tropical diseases for the U. S. Navy. These included Cdr. J. M. Amberson, MCR, USNR, physician and surgeon; Ernst Schwarz, zoologist; Cdr. Trenton Ruebush, USN, parasitologist; Harry Hoogstraal, mammalogist and entomologist; Deaner K. Lawless, CPhM, USN, assistant parasitologist; and Harley F. Cope, Jr., PhM 2/c, USN, aerial and medical photographer.

In addition to providing medical aid to members of the expedition, these specialists are to obtain information concerning general health conditions, tropical diseases, parasites, and animal carriers of infection.

Extensive zoological collections of various animal groups for research and medical purposes will be made. An essential point in the program will be the study of the ecology and distribution of reservoir hosts —in particular, of commensal rats.

An effort will be made to obtain for study in the laboratory new strains of protozoa and bacteria that produce disease, and to find and bring back animals that can be developed into laboratory animals to suit special lines of research.

Field trials will be conducted, using the most newly developed drugs to determine their efficacy in the prevention of tropical diseases.