Published from 1950 to 2004, the short papers of the Postilla series reported on original research by the Yale Peabody Museum of Natural History’s curators, staff, and research associates, and their colleagues, in the natural science disciplines represented by the collections of the Museum’s curatorial divisions.

The Postilla series, which ceased publication with Number 232 (2004), was incorporated into the journal Bulletin of the Peabody Museum of Natural History, available from BioOne Complete at https://bioone.org/.

Yale Peabody Museum scholarly publications are archived through EliScholar, a digital platform for scholarly publishing provided by Yale University Library at https://elischolar.library.yale.edu/.

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. https://creativecommons.org/licenses/by-nc-sa/4.0/
I. INTRODUCTION

CHARLES A. REED
PEABODY MUSEUM OF NATURAL HISTORY, YALE UNIVERSITY

The Yale Prehistoric Expedition to Nubia was organized in answer to an invitation from the Government of the United Arab Republic for all nations to contribute to the campaign to salvage the monuments of Nubia. The occasion for this intensive international research program was the building of the High Dam near Aswan, at the junction of Upper Egypt with Nubia. Whereas most of the resulting expeditions were historically oriented, excavating remains of the ancient civilizations of Egypt, the Yale group of prehistorians, earth scientists and biologists have concentrated instead on events of the half-million years or more that preceded the rise of the first ancient civilization in Africa.

One aspect of our research has been the history of the changing environments throughout the long period being studied by us; a major key to the study of such paleo-environments is the deter-

1 The second paper in this series on the results of the Yale Nubian Expedition's research at Kurkur Oasis will follow shortly: Butzer, Karl W. "Pleistocene Paleoclimates of the Kurkur Oasis, Egypt." Canadian Geographer (in press).
mination of climatic changes, with the facts being derived primarily from the geological evidence. While most of the work of the Expedition was close to the Nile River, both north and south of Aswan, and while much can be learned from a study of the geological phenomena close to the river, yet the Nile is a peculiar stream and its own complexity makes the unraveling of its past history a difficult matter. One part of the complexity is the situation that its drainage is from Abyssinia and East Africa, which areas have a monsoon climate; the river then runs through the Sahara Desert and enters a region of Mediterranean climate.

If one is interested primarily in the past environments and the
prehistoric peoples of Egyptian Nubia, as we were and are, by virtue of having our studies concentrated there, the paleo-environmental history as seen in the sediments and the cycles of erosion and deposition is complicated by this factor of the monsoon influence to the south being superimposed upon the evidences remaining from the fluctuations of the local climate, this latter being essentially peripheral Mediterranean.

For a study of the purely local climate, one needs an oasis, where the environment was and is unaffected by the complexities of the Nile’s flow. A small oasis would be best; being small, it would be sensitive to local changes, and the evidences of such changes could be interpreted by the experienced geologist.

Such an oasis—small, local and fairly accessible—is Kurkur. Karl Butzer, the Expedition’s geologist for the first season (1962-1963) of our work (which still continues), had understood the importance of Kurkur Oasis from the first suggestion that we might have an Expedition, and the necessity of field work there had been basic in all of our planning.

* * * * * * * * * *

West and somewhat south of Aswan, Upper Egypt, across a part of the eastern Sahara known as Egypt's Western or Libyan Desert, lies a small spot of serene and isolated beauty, where dom and date palms cluster around a few hidden pools in a wadi bottom, and vegetation of mixed palms, acacias, thorn-bushes and halfa grass straggles thinly away into the desert along the wadis radiating from the central pools. This is Kurkur Oasis, only 62 km from Aswan, but almost totally unknown today to most people in that industrial city, which now is linked into the modern economic and transportation networks of the world and has forgotten the caravan trails of yesteryear.

Most of Egypt’s oases in the Western Desert are the by-products of massive blow-outs, the rock having been removed by wind erosion until the water table is exposed. Kurkur by contrast would

* Specifically, the oasis lies at 23° 54’ 10” N. and 32° 19’ 10” E. (Ball, 1902).
appear to have been formed where a major wadi was eroded from a plateau down through a scarp (the "Sin el Kidab") onto a plain leading to the Nile, although Said and Issawy (1964) ascribe
a dominant role in the origin of the present oasis depression to local solution and deflation during alternate wet and dry periods of the Pleistocene.

The oasis lies in an area of marine sediments, Cretaceous to Eocene in age. (The following description of the stratigraphic succession is abstracted from Said, 1962, as modified by personal communication with Dr. Said.) The major topographic feature is the Sin el Kidab which, to the south of Kurkur, is capped primarily by the Thebes limestone (lower Eocene). At Kurkur and to the north, however, this Eocene limestone has been eroded to the west except for a few outlying remnants such as the top of the Gebel Garra. At Gebel Garra and along the Sin el Kidab northward the Esna Shales (Paleocene) underly the limestone, but south and west these shales change laterally into a carbonate facies, which here becomes indistinguishable from the Chalk formation (Paleocene). At Kurkur the uppermost part of the Chalk, probably in part comparable to the Esna Shales in position and time, is also eroded to the west, and the oasis is incised into the lower part of the Chalk.

Four to five meters of highly fossiliferous sandy limestone, widely discussed in the older literature as "Kurkurstufe," underlies the Chalk and is exposed in places in the bottom of the main wadi in the southern part of the oasis. Said (1962) had thought the Kurkurstufe to represent the base of the Chalk, but now (1964) he considers it instead to lie below the Chalk and occupy "... a stratigraphic position similar to that of the Dakhla shales to the north and east. In this respect the Kurkurstufe replaces the upper part of the Dakhla shale unit rather than the Chalk rock unit. ..." If true, the Kurkurstufe would seem necessarily to be uppermost Cretaceous, as are the Dakhla shales, and the change represents one more episode in the frequent transfers in the geological literature of this thin but highly fossiliferous bed between Cretaceous and Paleocene. These Dakhla shales (the "Exogyra overwegi" beds of many older authors; the "foliated marls" of Cuvillier, 1935) would seem not to be represented

3 It is my personal opinion that the amount of water draining from the Kurkur area at different times in the Pleistocene would seem quite sufficient to account by erosion alone for the creation of the present wadi system, in part of which the oasis lies, without the necessity of presuming that alternate solution and deflation has occurred, unless there is good geological evidence for these latter phenomena.
otherwise in Kurkur oasis, but are well-known from the face of the scarp at Gebel Garra. Below the Dakhla shales lie the massive beds of the Nubian sandstone (Cretaceous); to the west of the Sin el Kidab these sandstones underly all the strata mentioned above, but to the east they form the surface of a gently sloping plain to the Nile.

The scarp of the Sin el Kidab also forms the boundary between the physiographic areas of the more elevated “Lower Nuba Tableland” to its west and the “Lower Nuba Plains” between itself and the Nile to the east (Shata, 1962). Kurkur thus lies almost on the boundary between these two physiographic areas, but since most of the vegetation of the oasis does not grow in the deepest and steepest part of the wadi, at the scarp’s edge, but is slightly to the west and north, in the wider and higher part, the oasis is definitely on the eastern edge of the Lower Nuba Tableland.

Kurkur is one of Egypt’s smallest oases, with a central mass of 27 clumps of dom palms clustered in an oval area no greater than 25 by 30 meters. The whole of the vegetated area is in the form of a Y with a crooked base; the two upper branches of the Y are wadis of gentle declivity draining from the north and northwest and meeting approximately 360 meters to the north of the main mass of palms. The crooked base of the Y is the main wadi, which descends gently to the south for a few hundred meters, and then cuts down through the Sin el Kidab more steeply to the east. The north and northwest wadis extend outward into the desert with vegetation diminishing from palms to acacias to scattered grass and camel-thorns, but some parts of the main wadi below the oasis and across the Lower Nuba Plain to the Nile are densely carpeted with living camel-thorn, indicating the persistence of underground water down the wadi.

The earlier geological studies on Kurkur and adjacent areas were concentrated on stratigraphic problems of the Upper Cretaceous and Lower Tertiary and on identification of the invertebrate marine fossils contained in those strata (see Cuvillier, 1935, for a summary). Only passing mention (chiefly by Ball, 1902) was made by these earlier authors of Quaternary geology and history. However, as outlined in my introductory paragraphs, the Quaternary aspects of the region are of particular importance and interest to prehistorians, and so it was upon Quaternary prob-
lems that the members of the Yale University Prehistoric Expedition focused while at Kurkur, 8-12 March, 1963.

Kurkur Oasis does not now have any flowing water; indeed, of the two wells reported by Ball the northern one is at present sanded in. However, at different periods in the past (presumably entirely within the Pleistocene), there has been much more local water, derived in part from greater rainfall than at present and in part released by lime-bearing springs which built up local deposits of tufa and travertine. As discussed above, Dr. Karl Butzer, chief geologist for the Expedition, believed that the study of the local tufa terraces, which may mark successive periods of long-term greater rainfall, and that the study of other geological phenomena at Kurkur, would help to clarify the sequences of climatic changes in Upper Egypt and Nubia throughout the Pleistocene and Recent.

At the time of Ball's visit in 1901, there were two existing wells, which he called north and south. Neither he nor anyone else seems to have noted a third well, now dry, which I found hidden in a cluster of palms near the mouth of the north wadi. This well was large enough (6 meters across and almost 3 meters deep) to be a walk-in type, with a staircase of cut palm logs down the west side. Perhaps it was used at the time of a military occupation of the late nineteenth century. The northern of the two wells reported by Ball and the one being used for irrigation in 1934 (Evans-Pritchard, 1935) is now sanded in and was already sanded in by 1937 (Mursi, personal communication).

In the area where Ball mentions a “south well” there are, however, two small wells (*pool* is a more accurate description of each) approximately 100 m and 120 m down-wadi (south) from the central cluster of palms, and in 1963 two of our group dug a third well in this area. In two places further down-wadi we found dried mud indicating former seeps, and Evans-Pritchard (1935) also found some pools not mentioned by Ball. However, the two pools found by our group have every appearance of permanence; each is approximately 2.0 meters in diameter. The surface is

---

*I am personally of the opinion that no pluvial period of any duration or intensity has occurred in this area since the stabilization of the Sin el Kidab, that is, possibly since the early Pleistocene (Said and Issawy, 1964), as so few erosion-wadis have cut back into the scarp. One would expect that pluvial periods, even if with a low annual rainfall, would have resulted in the Sin el Kidab and the Lower Nuba Tableland being deeply incised by wadis, carrying away the annual run-off.*
about a half meter below ground-level, and the pools are shallow, from 25 cm to 40 cm deep. These pools are surrounded by scattered palms and high coarse grass. A clump of cattails (*Typha australis*) grows luxuriantly adjacent to and directly south of the southern of these two pools.

The source of the water at Kurkur remains to be determined. Ball (1902) is the author who has discussed this problem most thoroughly; he noted particularly that the water at Kurkur, 330 meters above sea-level, is much higher than is the water in the larger oases (Kharga, Dakhla, Baharia, etc.), where it comes from the Nubian Sandstone and is rarely found above 120 m. Thus the water table at Kurkur is either higher than it is to the north and west and occurs in one of the strata overlying the Nubian Sandstone, or the water is derived from a source other than a water table. If a water table exists at Kurkur at 330 meters elevation, to be intersected by the wadi at that level, one would expect that there would be other seeps or springs along the face of the Sin el Kidab at similar levels, but except at Kurkur and Dungul Oases there are none.

Hume (1908, 1913) definitely believed in the presence of such a high water table, overlain by permeable strata and underlain by an impermeable one, which situation he thought a constant one over a wide area, explaining the occurrence of water at several of the small oases of the Western Desert (Kurkur, Dungul, Nakheila, and Bir Murr). Later (1925, p. 134) he again considered this problem of the water at Kurkur; while still thinking an impermeable limestone layer to be a factor in maintaining a high water table, Hume admitted that in general no source existed for the water supposedly carried on such a stratum and stated that particularly at Kurkur there was no catchment area sufficient to maintain the water supply as found.

An alternative suggestion made by Ball is that water comes from local rain, which occasionally falls during the winter months. Ball experienced such a rain⁵ and noted that the rock in the bot-

---

⁵This particular rain, on Jan. 25, 1901, was actually part of a devastating flood which elsewhere in Upper Egypt did tremendous damage (Hume, 1925, p. 83). Kurkur, however, was on the edge of the area of rainfall, as Ball (1902, p. 33) mentioned only casually a "slight rainfall." A terrific flood must have occurred another time at Kurkur, however, for a hundred or more palm logs and palm tops have been washed down Kurkur wadi; one finds them strewn for some seven kilometers, in places
tom of the wadi of Kurkur Oasis was quite impervious, keeping the water on the surface. Kurkur, however, is near the southern limit of the Mediterranean winter rains, so that the rainfall is usually sparse; the weather-station at Aswan records an annual mean of only 3 mm. An annual mean tells only part of the story, however, as rainfall in this area is highly erratic and there may be none in some years. If the oasis depends entirely on a supply of ground-water derived from local rainfall, one would expect that supply to fail sometimes, whereas by all records the water level in the pools appears to be quite constant\(^6\). The continued presence of cattails indicates that the water has never failed entirely since they began growing there.

The basis for Ball's idea, however, was the erroneous one that the wadis draining into the oasis had no outlet; he thought the valley to be a closed catchment basin. Actually, all of the wadis involved are natural drainage channels with definite declivities,\(^7\) a fact first noted in 1927 (Uhden, 1930), and made clear by Murray (1939; see his map of Kurkur facing p. 103, and also the map of Kurkur Quadrangle, Survey of Egypt, no. 12/72.) Any rainwater not immediately absorbed into the substrate would thus be drained away.

To me, at least, the idea that the present water of the oasis is derived solely from present rainfall is difficult to believe. Since the surrounding desert, which gets the same meagre and erratic rainfall as does the Kurkur area, supports no plant life, we would have to assume that the drainage-area of the wadis running into the oasis would trap and carry enough water to maintain the present

lodged in the rocks of the wadi walls. Indeed, it was the sight of these palm logs down-wadi that first gave Murray (personal communication) the idea that Kurkur Oasis could not be a closed catchment basin (as both Ball and Cuvillier maintained), before he had ever seen the oasis. The flood that carried these palm-trunks necessarily antedates 1934, when Cuvillier first photographed them.

\(^6\) The statement of Leuchs (1913, repeated by Hume, 1913) that water at the time of his visit was 6 meters below the surface must certainly be a typographical error, as no important fluctuation of any extent in the levels of the pools has been noted by others. Further, a fall of 6 meters in the water level would probably have taken several years to happen, during which time the cattails and many of the palms would have died. I suggest that Leuchs intended 0.6 meters.

\(^7\) It is curious that Ball, usually a most accurate observer, would make and publish such a strange error. I can only remark that in the few days he was at Kurkur he did an extraordinary amount of careful and detailed work, and he can certainly be excused the lapse of one small error.
flora in the oasis proper. Some of the acacias and thorn bushes might survive on such a meagre and erratic water supply but the palms and cattails most probably could not; indeed palms are not found elsewhere along the scarp except at Dungul (where wells also exist), and cattails are not present even there.

An alternative suggestion concerning the source of water at Kurkur (and presumably at Dungul, too) is that the springs lie atop a fault line (such a fault at Dungul was suggested by Hume, 1908), and that the water rises from a deeper source than a local water-table (Shata, personal communication).

Any conclusions concerning the origin of the present water at Kurkur Oasis must be reached in the light of the evidence that in the past there have been produced massive deposits of tufas and travertines, not only at Kurkur but also at Dungul. At Kurkur many of these tufas were spring-derived; the fossil mounds built up at the sites of the former springs, with their hollow feeder pipes are obvious features of much of the area. These tufas were deposited at successive periods of geological time, which periods of deposition alternated with drier periods during which water ceased or flowed in diminished quantities. During one of the later periods of flow, at least, the wadi must have carried water all the way to the Nile, as molds of fossil clams (Corbicula sp.), common in the Nile, were found in the tufa of a former spring, close to the present base-level of the main wadi of the oasis. Whether these periods of alternate flow and lack of flow were due to local or sub-continental changes in water supply, or whether such changes can be correlated with world-wide climatic changes of the Quaternary can only be determined by detailed geological study. Dr. Karl W. Butzer is in charge of, and will publish upon, these geological aspects of our investigations.

As part of a prehistoric expedition, the members of our group were naturally concerned about evidences of past human life. The oasis is not now inhabited, although it is visited sporadically by camel herders after there has been rain. Formerly, some caravans

---

8 The last phase of deposition of the tufas, according to Said and Issawy (1964), was in one or more temporary lakes in the bottom of the oasis, presumably in a late Pleistocene period.

9 These central feeder pipes to the springs, often partially or entirely filled with incentric rings of tufa, were mistakenly identified as remains of plant stems by some of the authors who have written about Kurkur.
(Recorded by Carl Hansen).

<table>
<thead>
<tr>
<th>March 1963</th>
<th>Temperature (F.)</th>
<th>Wind Speed (M.P.H.)</th>
<th>Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6:30 13:30 18:30</td>
<td>6:30 13:30 18:30</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>—     88     85</td>
<td>—         13-16</td>
<td>Haze; Haze; Haze;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max. 21</td>
<td>Max. 10</td>
</tr>
<tr>
<td>9</td>
<td>56    76     64</td>
<td>8-10     16-18</td>
<td>Haze Haze Haze</td>
</tr>
<tr>
<td></td>
<td>Max. 15</td>
<td>Max. 25</td>
<td>Max. 30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>51    70     64</td>
<td>10-12    10-12</td>
<td>Haze Haze Clear Clear</td>
</tr>
<tr>
<td></td>
<td>Max. 22</td>
<td>Max. 18</td>
<td>Max. 15</td>
</tr>
<tr>
<td>11</td>
<td>50    73     69</td>
<td>8-10     8-10</td>
<td>Clear Clear Clear</td>
</tr>
<tr>
<td></td>
<td>Max. 16</td>
<td>Max. 20</td>
<td>Max. 8</td>
</tr>
<tr>
<td>12</td>
<td>52    78     —</td>
<td>9-11     —</td>
<td>Clear Clear —</td>
</tr>
<tr>
<td></td>
<td>Max. 13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
used the oasis as a stopping place between Edfu, on the Nile to the north, and Dungul to the south. In the late nineteenth century, at the time of the Mahdi domination of the Sudan, an Egyptian military outpost of Ababde tribesmen\footnote{The Ababde or 'Ababda are a tribe living in the Red Sea hills, to the east of the Nile; they are a non-Arab group who have successfully maintained their identity from a time before the Arabic conquest of North Africa. Indeed, Murray (1935, p. 11) speaks of them as resembling the pre-dynastic Egyptians.} was established at Kurkur but was subsequently withdrawn. Hurst (1910), Uhden (1930) and Evans-Pritchard (1935) have recorded sporadic attempts of Ababde families to maintain themselves at the oasis, but neither they nor caravan visitors nor the military have left much evidence of their respective occupations except occasional hearths and much camel and donkey dung.

The major occupation definitely was prehistoric. We discovered one Middle Paleolithic group of artifacts in a wadi bottom and located 16 surface sites with Upper Paleolithic assemblages. These latter were either on top of scarps above the oasis or on lower prominances between wadis in the general depression of the oasis. The Upper Paleolithic artifacts are of the “Khargan” type, as reported from Kharga Oasis by Caton-Thompson (1952). Of the 16 sites mentioned, we collected eight entirely and one-half the area of another site, the largest one.

One would expect that the “Neolithic Wet Period” (Butzer, 1958) would have been an optimum time for human occupation, but we located only one piece of Neolithic-type pottery from this period. However, there may be more sherds and other evidences of Neolithic inhabitants which we failed to find, since Said and Issawy (1964) mention Neolithic artifacts found by members of their group at Kurkur in January, 1963. Mr. David Boloyan will study, and publish on, the archeological material collected, and Mr. Boloyan and I intend to add a further note on a game-trap of unknown age but complex pattern, constructed with lines of stones so arranged as to direct animals being chased into a small enclosure, where they could be killed. The trap was presumably built for gazelles, which are still present at the oasis.

In addition to the studies on the Quaternary geology and prehistoric archeology, collections were made of Pleistocene invertebrates and plants (preserved in some of the tufas) and of Recent
mammals, reptiles, birds, insects and plants. Observations upon some of these materials will be published by different members of the Expedition in subsequent numbers of this series.

**HISTORY OF EXPLORATION AND SCIENTIFIC RESEARCH AT KURKUR OASIS**

1. The Franciscan father Theodor Krump may have been the first European to visit the oasis, in December, 1700. (Uhden, 1930; Evans-Pritchard, 1935). However, Uhden states that Krump's journal is so vague that nothing of value regarding Kurkur can be derived from it.

2. William Willcocks, chief engineer for the first Aswan Dam, certainly visited Gebel Garra, studied the stratigraphy, and collected marine invertebrate fossils from Gebel Garra and from areas between Gebel Garra and Kurkur. (Fourtau, 1913, gave the date of these studies as 1891-1892.) Willcocks briefly mentioned both Kurkur and Dungul (Willcocks, 1899, p. 6), but when or for what duration he visited them I have not been able to discover. Ball (1902) stated definitely that Willcocks had been at Kurkur and in the same sentence said the same for the invertebrate paleontologist K. Mayer-Eymar, a statement repeated by Evans-Pritchard (1935).

3. A man named Sickenberger and some of the engineers working on the first Aswan Dam collected fossils at Gebel Garra and/or Kurkur, about which Mayer-Eymer was publishing as early as 1896 (Cuvillier, 1935).

4. John Ball, January, 1901, (Ball, 1902). Ball's study not only was, but remains, one of the most thorough for the oasis. He was the first to locate the area accurately, working from known triangulation points on the Nile, and he was also the first to establish accurate elevations. His geological observations are basic to all later studies, and his topographical map is the basis for those of most later authors who have published a map. Since he had only ten days for the round-trip from Aswan, spent two days traveling each way by camel, and also explored the region of Gebel Garra, his labors at Kurkur—seemingly with the help of only a single assistant—were prodigious.
5. W. F. Hume (Hume, 1908, 1911, 1913). Starting in January, 1908, Hume made a circuit from Tomas on the Nubian Nile through Dungul, Nakheil, Dush (and Kharga Oasis generally), Kurkur, and back to the Nile at Edfu. His published observations on Kurkur, specifically, are few, nor does he mention the date of his visit. The trip was made by camel.

6. H. E. Hurst (1910). Hurst visited Kurkur in December, 1909, on his way to Dungul as a member of a magnetic survey party. The duration of his stay at Kurkur was not stated. At the time of his visit the oasis was inhabited by a single Ababde family and their few animals. His observations on Kurkur have little of scientific value, but he does make the most interesting observation that Kurkur at that time was quite a resort for tourists from Aswan, which statement I do not find elsewhere. However, this curious situation, if true, may form the basis for a most intriguing paragraph in a presently-popular guide-book to Egypt (Ziock, 1962, p. 338): “The visitor who has enough time at his disposal might do worse than make an excursion of some days to go to the Kurkur oasis, about 31 miles from the Nile Valley. It takes about a week to do the outward and homeward trip on a camel or on horseback; tents, provisions, and water must be taken. Dragomans can furnish information and prepare the caravan.” These sentences certainly read more like something out of the Edwardian period than they do for the modern space-age.

7. Kurt Leuchs (Leuchs, 1913a, b). This trip was of 12 days, presumably by camel, from Aswan. The author was accompanied by his wife. His route led first to Gebel Garra and then to Kurkur. Here, his geological observations added little to those made by Ball, except that he did note that the tufas extended much further from the present oasis than Ball had indicated. However, he was the first to publish on prehistoric artifacts, with a paragraph of description (1913a) of a Paleolithic working-place discovered in the northern part of the oasis. He noted also that the tufas antedated the artifacts, since the latter were found atop the former.

8. Richard Uhden (1930). Uhden visited Kurkur in October, 1927, probably on the 21st-23rd inclusive, on his way to Dungul by camel. He discussed the changeable position of Kurkur on maps
prior to Ball's survey and added some geological observations of his own. At the time of his visit the oasis was inhabited by some Ababde, who had been living there since 1925.

9. E. E. Evans-Pritchard, the well-known social anthropologist, took a pleasure trip by camel from Aswan to Dungul Oasis in January, 1934 (Evans-Pritchard, 1935). He stopped at Kurkur a day and two nights, leaving the morning of January 13. He followed Ball (1902) in his discription, and mentioned that an Ababde family came each year in the summer to pasture their sheep, goats and camels and to grow some vegetables by irrigation from the north well. As he left, Evans-Pritchard looked back regretfully on this "delightful little oasis," an experience identical with that of each member of our group.

10. Jean Cuvillier (1934, 1935). This expedition followed Evans-Pritchard into the oasis by not more than two days at least, seemingly without being aware that another European had recently preceded them there. Cuvillier's expedition occurred between the 12th-16th January, 1934, but since he started by car at Edfu 200 km away and followed the caravan trail up the west side of the Nile and since he also stopped at Gebel Garra, the time allowed for Kurkur must have been brief. Cuvillier may have been the first to try to reach Kurkur by car, although Evans-Pritchard mentioned seeing tracks of automobiles along the camel trail between Gebel Garra and Kurkur. Actually Cuvillier did not get his automobiles into the oasis proper but walked the last few kilometers; indeed the approach directly up-wadi as he tried it is impossible for a car.

He published a good resumé of prior work with a rather complete bibliography and summarized all earlier discussions of problems of stratigraphy and marine invertebrate fossils, but his descriptions of all of the tufas having been formed in a lake and his misinterpretations of the vents of springs as paleo-botanical specimens indicate his preoccupation with matters other than the Quaternary. His major interest was in early Tertiary stratigraphy and the associated invertebrate fossils; of those latter he made an excellent collection.

11. The Survey of Egypt (1937-1938). Khalaf Mursi, whom I visited in Cairo in December, 1963, was the chief cartographer
of the topographic map of Kurkur Quadrangle, Survey of Egypt sheet no. 12/27, at 1:100,000, which is still the standard map of the area. The cartographic survey was done under the direction of G. W. Murray, who (1939) alluded briefly to Kurkur in an interesting description of various topographic and historic features of this and adjacent areas of Egypt and Sudan. Mursi (personal communication) has told me that his group was the first to locate the automobile track into the oasis, and was the first to get their cars all the way to the oasis proper. They used standard pick-up trucks with no special gears or transmissions. At the time of their arrival in late 1937, Mr. Mursi says, the north well was sanded in, quite as we found it in 1963.

12. In 1939, Mr. Mohammed Wasfi, then Governor of Kharga Oasis, drove by automobile from Kharga to Kurkur and then on to Aswan (Khalaf Mursi, personal communication).

13. G. H. Awad and Bahay Issawy collected Paleocene fossils at Kurkur in 1958 for the Department of Geology at the University of Alexandria.

14. The Desert Institute (Shata, 1962). As a part of the field work for the geomorphological survey of Lower Nubia, members of the field party of the Desert Institute visited Kurkur oasis for two days in the latter part of January, 1962. They did not succeed in getting their cars up the scarp over the road pioneered in 1938 by the Survey of Egypt but had to walk in.

15. The Geological Survey of Egypt (Said and Issawy, 1964). In late January, 1963, a party led by Dr. Rushdi Said spent a little more than a day at Kurkur to make plans for a more detailed geological study at some later time. They were accompanied by Dr. Fred Wendorf of the Museum of New Mexico, Santa Fe. The members of this group, using standard pick-up trucks with no special gears, drove all the way into the oasis.

16. Yale University Prehistoric Expedition to Nubia; 8-12 March, 1963. At the time of our work in Kurkur we were not aware that the area had recently been visited by parties from the Desert Institute and the Geological Survey of Egypt. Our group consisted of the following:
Aug. 20, 1964  Natural History Study of Kurkur Oasis

Official representative from the
Department of Antiquities,
United Arab Republic    Farouk Gomaa

Guide ..................... Mohammed Said Suliman

Earth-Scientists ............ Karl W. Butzer
Carl Hansen

Archeologist ............... David S. Boloyan

Biologists ................. Charles A. Reed (Director)
Thomas Lovejoy
Egbert Leigh

Medical zoologist (from U.S.
Navy Medical Research Unit
No. 3, Cairo) .............. Ibrahim Hilmy

Lest the assumption be made that archeology was neglected and geology and biology overstressed, it must be understood that our earth scientists, as prehistorians, are archeologically oriented; they worked with Boloyan for two days. Additionally, I located sites and collected archeological artifacts for two days and Leigh and Hilmy also collected intensively under Boloyan’s direction for shorter periods.

For transport we had a small Willys jeep from the U. S. Naval Medical Research Unit no. 3, Cairo, and Yale University’s large (10-passenger) Land Rover. The latter was seriously overloaded, with six people, water, gasoline, food, collecting equipment, tent, etc. Both cars had low-range transmissions and four-wheel drives, which equipment we found necessary. Even so, at the point where the track goes up and over the scarp of the Sin el Kidab to reach the Nuba Tableland, the Land Rover had to be unloaded and sand-tracks used (with all hands pushing) to negotiate the steep pull in soft sand and loose rock. (By contrast, the Geological Survey of Egypt uses standard Ford pickups with extra-size tires, and by report go anywhere they wish in the desert on either side of the Nile. They had, earlier in the year but unknown to us, negotiated this same steep pull where we had so much trouble.)
17. Yale University Prehistoric Expedition to Nubia and U. S. Naval Medical Research Unit no. 3 (NAMRU-3, with headquarters in Cairo). Three biologists (Ibrahim Hilmy, Chris Maser, and David Crockett) collected animals and plants at Kurkur Oasis, December 24-28, 1963, as part of NAMRU's long-range, inter-continental epidemiological research program. Their observations and collections were entirely biological, supplementing those of the Yale group of the previous March and also being more thorough. Transport was again provided by one car from NAMRU and the Land Rover from the Yale Expedition. Mr. Hilmy reported that the oasis had been visited by people with cars since he had been there with the Yale group in March, which activity may represent part of the routine patrol work of the "Desert Police" or Frontier Guard of the Egyptian military and not necessarily have been an unreported scientific party.

ACKNOWLEDGMENTS

The research of the Yale Prehistoric Expedition to Nubia for the season of 1962-1963 was supported by Grant no. G-23777 from the National Science Foundation and Grant no. SCC-29629 from the United States Department of State. The Expedition’s field-research for the season of 1963-1964, during which time the biological assistants Chris Maser and David Crockett conducted further biological study at Kurkur Oasis, was additionally supported by Grant no. GS-309 from the National Science Foundation and by grants from the University Museum of the University of Pennsylvania, from the Wenner-Gren Foundation for Anthropological Research, from the Society of Sigma Xi and the Scientific Research Society of America, and from the Higgins Research Fund of Yale University. To all of these sources we are most grateful, for without any one of them our research would have been seriously hampered, if not made impossible. Many people in the UNESCO office in Cairo and in the Government of the United Arab Republic aided our general program, but for our work at Kurkur specifically I must thank Col. Ahmed Abd-el Wahab, commander of the Frontier Office in Aswan in the spring of 1963. He understood the importance of our work, recommended a most able and interesting guide to us, and issued the
passes which allowed us to travel in the Western Desert. Lastly I give thanks to those good companions, the members of the Yale Expedition who were unfailingly cheerful and industrious beyond the normal call of duty under difficult conditions of transport and living.

**BIBLIOGRAPHY**


