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Stone-Age Man on the Nile

by Philip E. L. Smith
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Thousands of years before the first pharaohs, hunters and gatherers lived along the great river. Their adaptations to their environment underlay the later development of agriculture and high civilization

In Egypt today the annual rainfall south of Cairo, if any, is measured in millimeters. This has been true since the days of the pharaohs. In earlier times, however, the level of the Nile was much higher. The great river and its seasonal tributaries watered a countryside that was fertile and temperate in climate even though it was surrounded by inhospitable desert. This combination of circumstances makes prehistoric Egypt virtually a laboratory microcosm for the study of human adaptations.

When did men first inhabit the Nile Valley? Only in recent years has much been learned about Nilotic prehistory; even today knowledge is spotty. We do have proof that people representative of two general stages of human technological development, the Lower and Middle Paleolithic periods, were present in Lower (or northern) Egypt from about a million to 30,000 years ago. Apart from the evidence to be gleaned from stone tools, however, little is known about those early inhabitants of Egypt. For example, not a single human fossil from these periods has been found.

As we come to within some 22,000 years of the present, in the latter part of the Upper Paleolithic, a more detailed picture of Egyptian prehistory comes into view. We can begin to speak with some conviction of the way people lived, of their settlement patterns, economic activities and technological proficiencies, and of the environmental and climatic conditions that prevailed. It is of more than passing interest because the Old World during the Upper Paleolithic has traditionally been seen against the background of the harsh glacial environment of Europe at that time, when small groups of hunters pursued such cold-climate animals as the woolly mammoth and the reindeer. A greater contrast in settings can scarcely be imagined than that between the chill, art-rich caves of the Pyrenees and the Dordogne on the one hand and the lush green sloughs and side channels of the Nile on the other, where the hippopota-

mus, the hartebeest and the gazelle took the place of the reindeer, the bison and the wild horse.

Most of our new knowledge about prehistoric Egypt is a by-product of the dam construction at Aswan in Upper (or southern) Egypt in the 1960's. The Egyptian and Sudanese governments, in association with the United Nations Educational, Scientific and Cultural Organization, invited many foreign archaeologists to salvage monuments and sample as many as possible of the sites that would eventually be submerged by the enlarged Nile reservoir. Some of those who responded, mainly prehistorians from Canada, the U.S. and the U.S.S.R., concentrated their efforts on sites that had been inhabited by early man. Their work, undertaken in collaboration with colleagues in such related fields as geology and paleontology, has greatly enhanced our understanding of the preagricultural populations of the Nile Valley at the time when the last glaciers were beginning to retreat in Europe.

Not all the early-man sites investigated during the 1960's were in danger of flooding. The area where my group from the National Museum of Canada conducted excavations in 1962 and 1963 was threatened in a different way. The Kom Ombo Plain ("kom" is the Egyptian equivalent of the Near Eastern "tell" or "tepe," mound), about 50 kilometers north of Aswan, is an extensive area of ancient alluvial silts, which, although they are now desiccated, need only water pumped from the Nile to transform them into fertile farmland. Reclamation of this kind had begun at the turn of the century, when European promoters established pumping stations and developed sugar plantations on the plain. Now the Egyptian government decided to follow suit and resettle most of the population that would be flooded out of Egyptian Nubia in the remainder of the plain.

Many valuable Paleolithic sites at Kom Ombo had already been planted

with sugarcane. My group, sponsored by the Canadian government, and a group from Yale University undertook to salvage or sample a fair number of those that were still undisturbed. In so doing we were following in the footsteps of a French engineer and amateur archaeologist, Edmond Vignard, who worked in a Kom Ombo sugar refinery in the early 1920's and made many useful observations at a time when the early-man sites of the plain were still relatively intact.

Other advantages in addition to Vignard's reconnaissance were available to us at Kom Ombo. One was that the



KOM OMBO PLAIN, on the east bank of the Nile some 500 kilometers south of Cairo, is where the author and his colleagues inves-

stratigraphy, and thus the chronology, of the geological formations there has been worked out in considerable detail by Karl W. Butzer of the University of Chicago (together with his student Carl L. Hansen) and also by R. J. Fulton of the Geological Survey of Canada. These studies made it possible to match the various prehistoric sites with the geological record of fluctuations in the level and course of the Nile and also with changes in the local tributary streams that reflect past changes in local rainfall. The second major advantage was that whereas animal remains from the Paleolithic are both scarce and poorly preserved in most of Egypt, large quantities of bones are present at the Kom Ombo sites. The bones, of course, provide the investigator with invaluable clues to the early inhabitants' subsistence activities.

The environment in late Paleolithic times at Kom Ombo was the product of a complex interplay of factors. The behavior of the Nile itself—its long-term cyclical fluctuations, annual inundations, volume and velocity—was determined by climatic events far off in East Africa. Moreover, the local rainfall, the temperature and the behavior of the tributary streams flowing across the plain from their headwaters in the Red Sea Hills some 150 kilometers away were products of patterns of atmospheric circulation in the Northern Hemi-

sphere, where the European glaciers were still influential. Both factors interacted further with the geomorphology of the plain and of adjoining areas. The result was a mosaic of microenvironments and habitats in a restricted geographical zone. In such an unstable ecosystem rapid shifts in the inventory of plants and animals, and in the exploitative methods of the human cultures subsisting on them, might be expected to occur as one or another variable was altered.

In the Nile Valley immediately north and south of Kom Ombo the river and its floodplain have long been confined to a narrow corridor that runs between sandstone cliffs and high terraces. At Kom Ombo, however, a series of geological faults has caused the cliffs to retreat eastward, so that a wide depression, extending over 500 square kilometers, lies along the east bank. From the prehistorian's viewpoint the most interesting features of the local geology are the sediments—silts, sands and pebbles—that were deposited between 15,000 and 10,000 B.C. by the Nile and its tributary streams. The Nilotic silts, the products of soil erosion far to the south in Ethiopia, were laid down when the river was considerably higher and more vigorous than it is today. They stand some 15 meters above the modern floodplain. It is in and on these silts,

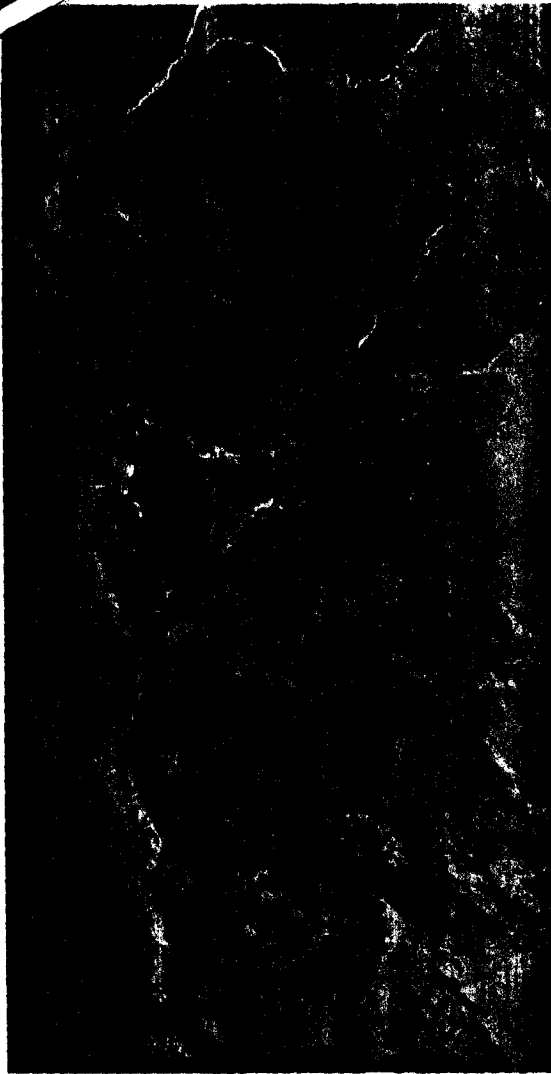
known as the Gebel Silsila Formation, that the late Paleolithic sites are found, in some places buried deep and revealed only by erosion or artificial cuts and in others lying exposed on the surface where the desert wind has blown away the concealing silt.

The plain today, with miles of green sugarcane plantations, vegetable fields and irrigation canals surrounding the new town of Kom Ombo, is very different from the arid, dusty wasteland of less than a century ago. It is also very unlike the plain of the late Paleolithic period. Archaeologists no longer accept the notion that before agriculturists transformed the Nile Valley in Neolithic times it was hostile jungle and swamp, difficult to reach, inhabited by dangerous animals and holding little attraction for man. We now know that on the contrary the valley was a zone of fairly open terrain where hunters, gatherers and fishermen had access to a biomass of aquatic and terrestrial resources that could support a considerable population. Moreover, the Kom Ombo Plain was a better than average segment of the Nile Valley, and its inhabitants must have been among the best-nourished people in the late Paleolithic world.

The climate in Upper Egypt at that time was only slightly less arid than it is today. We may guess at an annual



figated a series of Stone Age living sites dating back to between 15,000 and 10,000 B.C. The site being excavated here belongs to cultures designated Sebekian and Silsila, dating back to between 13,000 and 12,000 B.C. In it the investigators found stone tools characteristic of the cultures and bones of animals hunted by inhabitants. CMB in the background is part of the northern boundary of the plain.



LANDSAT SATELLITE PHOTOGRAPH shows the valley of the Nile as the colorful streak running at the left through the desert. The now intensively cultivated Kom Ombo Plain is the bulge to the right of the river. In this false-color photograph the green of the cultivated areas is translated into red. The widening of the river at the lower left is Lake Nasser, which is backed up behind the Aswan High Dam. At the right are the uplands leading to the Red Sea Hills. The valleys leading down to the Nile are wadis that were once seasonal tributaries of the river. They are now dry except on the rare occasions when there is a cloudburst in the Red Sea Hills.

precipitation of 10 or 20 millimeters, falling mainly in the Red Sea Hills during the winter months. The permanent river and the seasonal tributaries flowing westward from the Red Sea uplands, however, largely canceled out the effects of inadequate rainfall at Kom Ombo. The range of temperatures was lower than it is today by perhaps 10 degrees Celsius, and in winter there could be frost.

By that time the Nile had long established its modern regime of summer flooding, induced by the monsoon rains in East Africa. From August to October the river rose to inundate areas that today lie far beyond its shrunken floodplain. At its height the swollen Nile cut long, meandering side channels across the Kom Ombo Plain, creating what were in effect islands until the waters ebbed late in the fall. The floodplain was probably about five kilometers wide. The human settlements were concentrated along the levees of the seasonal overflow channels when the Nile was high and were shifted to the lower floodplain as the river receded. The banks of the tributaries, now dry wadis, have yielded few campsites; perhaps they were less attractive for settlement.

Little concrete paleobotanical evidence has been recovered at Kom Ombo, but it is possible to gain an overall impression of the vegetation, generally subtropical, that grew on the plain. In the low floodplain, in addition to a grassy mat that covered much of the area, a gallery forest of acacia, tamarisk, sycamore and Egyptian willow probably stood beside the main stream. Less dense growths of the same trees would have occupied the channel levees. Thorn trees probably grew in the larger tributary valleys, and the higher water table outside the zone of annual flooding probably supported a semi-desert vegetation of low scrub or brush with dry grassland on the hills and scattered desert shrubs farther east. We can also assume a rich growth of aquatic flora—reeds, sedges, lotuses and papyrus plants—along the river, the side channels and the sloughs.

C. S. Churcher of the University of Toronto has analyzed the animal remains from our excavations. His work has revealed a surprisingly wide range of vertebrates: at least a dozen taxa of mammals, 22 of birds, three of fishes and one taxon of reptiles. Prominent among the mammals are a now extinct large wild ox (*Bos primigenius*), the bubal hartebeest (*Alcelaphus buselaphus*, a species still living in the Sudan) and several species of gazelle. These and the hippopotamus were the most important game animals. There were in addition hares, hyenas, a species of canine, bandicoot rats and possibly the so-called Barbary sheep (the aoudad, *Ammotragus lervia*, still found in North Africa).

In the streams and pools lived the

large Nile catfish, the Nile perch and the African barbel, as well as clams, the Nile oyster and a species of soft-shelled turtle. Many of the bird bones are representative of migratory species; the Nile Valley was probably then, as it is now, an important flyway between Europe and Africa. Wading and diving birds included numerous goose and duck species, the cormorant, the heron, the flamingo, the spoonbill, the crane and the curlew. Apparently the elephant, the giraffe, the rhinoceros and large carnivores such as the lion and the leopard were not present. The ostrich, the wild pig, the zebra and the crocodile may well have existed there, but we found no trace of them among the animal bones.

Such an abundant concentration of plant and animal resources must have made Kom Ombo one of the most attractive human habitats available anywhere in late Paleolithic times. An economy at once river-oriented and diversified was to emerge at Kom Ombo and flourish for at least 5,000 years. Even though much archaeological evidence has been destroyed and precise information on the vegetation is meager, we can to some extent plot the seasonal flow of food energy through the plain and attempt to show how human activities were accommodated to long- and short-term fluctuations in the energy flow.

The earliest of the Upper Paleolithic sites at Kom Ombo are about 17,000 years old. There were probably people on the plain before that time, but either their sites have not been preserved or they remain undiscovered. In any event in the centuries immediately preceding 15,000 B.C. rainfall at Kom Ombo was minimal, there was little seasonal runoff in the tributaries and vegetation and game were probably sparse away from the Nile. From about 15,000 to 10,000 B.C., however, rain was generally more plentiful and tributary runoff was greater. The climatic change evidently contributed to rich and varied cultural developments. The same general phenomenon, although differing in detail, has been reported by other excavators who have worked recently in Lower Nubia and Upper Egypt. Evidence of a cultural flowering up and down the Nile Valley has caused prehistorians to revise the traditional view that the later Paleolithic of the area was impoverished. At Kom Ombo alone during this 5,000-year interval we find emerging a series of styles in the manufacture of stone tools (which prehistorians call industries or sometimes, as a convenient fiction, cultures); they vary considerably in the form of the tools, the methods of manufacture and the kinds of stone the tool-makers preferred. We are still not entirely certain how this unexpected and seemingly anarchic diversity in tool production should be interpreted, but it is

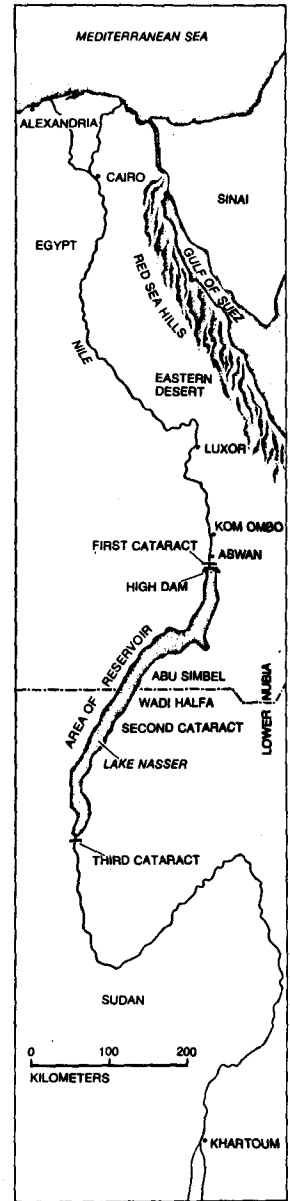
surely one of the most intriguing new aspects of the prehistory of Egypt.

The majority of the stone tools are small and light. Small flakes and blades were struck from a stone "core" and then chipped into tools. We find no implements that can be interpreted as axes or adzes, and only a small number of heavy tools (usually roughly split or chipped pebbles) appear to have been used for smashing or chopping. Some of the tools are only a few centimeters in length, small enough to be characterized as microliths. One can only assume that most of the stone artifacts were associated in one way or another with the subsistence activities of their makers; unfortunately, as is usually the case in Paleolithic studies, it is hard to ascertain the precise function or functions of an artifact with any degree of certainty.

The first late Paleolithic stone-tool industry recognized on the Kom Ombo Plain is called the Halfan. Carbon-14 determinations at several small campsites place the Halfan industry around 15,000 B.C. It is a curious industry combining relatively archaic and relatively advanced technological features. The archaic feature is what prehistorians call the Levallois method of removing large flakes from a specially prepared core. The method was known in Egypt, in Europe and elsewhere for hundreds of thousands of years before the Upper Paleolithic period. The advanced feature is the fabrication of small flakes with lightly retouched edges.

Only a few Halfan sites have been found. Perhaps the Kom Ombo Plain was not densely occupied at the time. Indeed, it is not until about 13,000 B.C., following a phase when the volume of the Nile had decreased somewhat and its annual inundations were lower, that sites on the plain become fairly abundant.

A second industry, which we have called the Silsilian, and a third, known as the Sebekian, appear roughly between 13,000 and 12,000 B.C. The Silsilian industry specialized in microlithic tools: many small "backed" blades (that is, blades blunted on one edge) and even tiny triangles and trapezoids made on blades of such exotic multicolored stone as agate, jasper and quartz. The Sebekian industry featured longer, narrower blades with the edges lightly retouched by "nibbling," usually near the base; the makers showed a preference for gray or buff-colored flint. Beginning about 11,000 B.C. and continuing for several



MAP OF THE NILE shows the course of the river from the Sudan (bottom) to the Mediterranean (top). Some 15 years ago the Egyptian and the Sudanese governments invited many foreign scholars to investigate archaeological sites, actual or potential, along the river that later were flooded by the new reservoir or were destroyed by land reclamation.

millenniums thereafter, a fourth industry, the Sebilian (identified and named by Vignard half a century ago), is found at Kom Ombo. Here the old Levallois technique of core preparation reappears; many of the flakes struck from the core were broad and thin. They were then chipped into geometric shapes, including large triangles and trapezoids as well as microliths. More or less contemporaneous with the Sebilian, and sharing certain of its traits, is a fifth group of artifacts we have named the Menchian

industry. Many of the Menchian tools are made on rather thick, heavy flakes and blades; they may have been used for scraping. Both the Sebilian and the Menchian artifacts seem to be associated with sandstone slabs and handstones that were evidently used for grinding or pulverizing.

To what extent these variations in stone-tool industries reflect distinct sociocultural groupings, or specialized subsistence activities, or the evolution

of one or more traditions over a period of time, it is still difficult to say. The long-term cyclical oscillations of the Nile may well have had some impact on the cultural situation. When the level of the river dropped, as it periodically did for centuries or millennia, many of the valley zones outside the Kom Ombo Plain where the floodplains were narrower would have been adversely affected as the annual inundations were more restricted. The total biomass of the plants and animals in such areas would have been reduced for long periods, and under such conditions there might have been a tendency for the human groups living in them to move into larger and stabler zones such as the Kom Ombo Plain. The migrations, whether temporary or permanent, of outside groups to the Kom Ombo Plain may help to explain some of the rapid cultural changes and replacements the stone-tool industries seem to reflect between 15,000 and 10,000 a.c.

The exploitable part of the Kom Ombo Plain, which includes the former Nile floodplain, the wadis and the groundwater zones but excludes the modern floodplain (then largely submerged) and isolated rocky outcrops, was probably about 400 square kilometers, or about 150 square miles. It is not easy to calculate the density of Paleolithic populations, but a very approximate figure, based on recorded populations of recent and still living nonagrultural peoples with diversified patterns of subsistence, is about one person per square mile. Thus it is likely that the Kom Ombo Plain could have supported at least 150 people and perhaps as many as 300 under optimum conditions. It is of course unlikely that the population density was constant over the 5,000-year period.

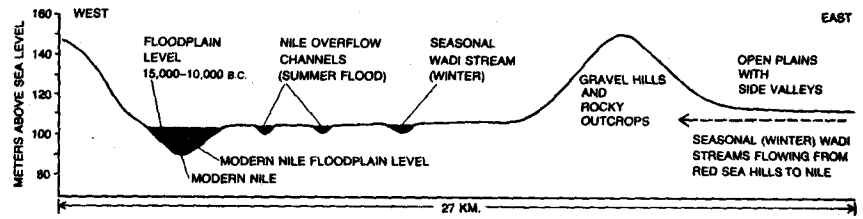
Analyses of the animal remains, together with what we can infer of the river regime and the vegetation patterns, strongly suggest that the plain was capable of supporting human life not just seasonally but all year round. It is nonetheless highly unlikely that the population of the plain could have remained together as a single group throughout the year, or could have remained permanently in a single locality. Probably at any one time the population was split into a number of small bands, perhaps composed of related families who tended to hang together in a loose kind of organization. Each band probably moved in an annual cycle related to the seasonal availability of different food resources. Each of the bands may even have been identified with a certain territory on the plain, although these territories were probably not exclusive. Whether the entire population, or only those who recognized themselves as being culturally related, periodically came together for economic or social purposes we do not know, but judging by



- NILOTIC DEPOSITS BEFORE 15,000 B.C. (MASMAS FORMATION)
- NILOTIC DEPOSITS 15,000-10,000 B.C. (GEBEL SILSILA FORMATION)
- POST-10,000 B.C. NILE AND WADI DEPOSITS
- MODERN NILE FLOODPLAIN ALLUVIUM
- ROCK OUTCROPS AND HILLS
- PREHISTORIC NILE CHANNELS
- PREHISTORIC WADI TRIBUTARIES

MAP OF THE KOM OMBO PLAIN shows the prehistoric Nile channels, wadi streams and geological deposits. In the period between 15,000 and 10,000 B.C. the river was considerably higher and more vigorous and the climate somewhat less arid than today. Map is based on studies undertaken by Karl W. Butzer of the University of Chicago and his student Carl L. Hansen.

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SCHEMATIC CROSS SECTION OF THE FLAIN on a line running east and west in the period between 15,000 and 10,000 B.C. shows height of the Nile, overflow channels and wadi streams. Annual flood of river covered a much greater area than it does today.

the behavior of living hunting peoples it is not unlikely.

The settlement system and subsistence strategy that prevailed were undoubtedly fluid, since they would have had to be correlated with seasonal variations in the abundance of food, just as biomass output itself was linked to short- and long-term pulsations in rainfall and river height. The output was probably spread fairly evenly over most or all of the year, although winter and spring (approximately from November through April) would have been the seasons of abundance. Much of the aquatic biomass, including fish, clams, oysters, waterfowl, turtles and hippopotamus, and such edible plants as water lily, water chestnut, water lettuce, water plantain, papyrus and other reeds, was probably available in all seasons. These foods would have been exploited along the side channels during the flood period from August through October and along the main stream at other seasons. Dry-land provender, including fruits, berries, nuts and edible gums from the acacia, the palm, the sycamore and other trees, and perhaps melons, cucumbers, the "Abyssinian banana" (*Ensete edule*) and various wild grass seeds, would have been most abundant in winter and spring, during and just after the rains. These plants would have been most common along the wadis but would also have grown on the desert steppe beyond them. Roots and bulbs should have been available throughout the year.

Most of the large mammals, particularly the wild ox and the hartebeest (the principal sources of meat), would also have been hunted in winter and spring. One hunting area was the marshy floodplain with its natural pastures beside the lowered river. The wadis and the grassy hills and plains to the east of Kom Ombo were a second area. The herds of wild cattle, unable to go for long periods without water, were almost certainly never far from the channels, pools and pastures of the floodplain and might even have been systematically culled by the hunters all year long. The hartebeests would have ranged more widely, and in the winter, when the tributary

streams were flowing, they were probably found along the wadis. Remains of gazelles and asses and perhaps Barbary sheep suggest hunting forays into the drier open grasslands, hills and the fringes of the desert. Fowling was probably in the main a winter activity; many of the birds identified by the bones unearthed at Kom Ombo (for example the crane, snipe, goosander and several other species of duck and goose) are migratory.

Late spring and early summer (from April through June) was probably a more difficult period of subsistence. As the heat and aridity increased, the Nile shrank to its lowest level, the grassy vegetation diminished and some of the game dispersed. At this time of year the hunting bands may have been forced to split up into smaller units, each perhaps consisting of a few nuclear families, and to spread out more widely in order to exploit the less abundant food resources of the plain until the summer floods resumed.

In terms of reconstructing seasonal activities on the Kom Ombo Plain, one of the most informative sites we excavated was Gebel Silsila III, near the northern end of the plain about four kilometers east of the present Nile. The site stands near a side channel of the Nile that 15,000 years ago ran a few hundred meters from a range of sandstone cliffs. When we found the site in 1962, it was almost entirely buried under an accumulation of hard, carbonate-rich Nilotic silt as much as a meter thick, deposited by river floods soon after the site was abandoned. Only a scatter of flints and bones exposed on the wind-eroded surface betrayed the site's existence. With the aid of Robert Fulton, my assistant Morgan Tamplin and I spent several months excavating here in the winter of 1962-1963. The site proved to be stratified in two main levels: a rich Sebekian occupation, containing many stone tools and animal remains, overlay a somewhat poorer Silsilian one.

Between 13,000 and 12,000 A.C. the prehistoric inhabitants of the plain had settled near a small depression, some 10

meters in diameter, that held water during at least part of the year. Here they lived and ate, built their fires and made their stone artifacts. The large quantity of flint tools manufactured and discarded on the spot, the great number of broken animal bones and the overall size of the area occupied indicate that, at least for the Sebekian people who lived there last, this may have been an important base camp. They hunted cattle, hartebeest and gazelle (a variety of game that reflects the exploitation of several distinct microenvironments), ate an occasional hippopotamus, caught turtles, catfish and perch and killed at least 14 different kinds of birds. It is possible that the Sebekian group occupied the site during more than one season of the year, although not necessarily the year round or even for very long at any one time. For example, the bones of migratory birds suggest that the Sebekian group was at the site at some time between September and April. The bones of immature gazelles, which presumably, like their modern counterparts, were born either in January or in late July and August, show that the group was present at one or both of these times. The bones of immature hartebeests, born at any time between May and December, also point to summer and/or fall occupancy.

In addition to stone tools and animal bones two more intimate relics of human presence have come from the Gebel Silsila III site. One, found in the lower level, is a milk tooth from a Silsilian child less than seven years old. This evidence that children were among the early occupants of the site lends weight to the view that we are dealing here with a family group rather than, say, a temporary encampment of adult hunters. The other relic is a lump of hardened mud from the upper, Sebekian level. It clearly shows impressions from the palm of a human hand, probably an adult's, and is one of the rare examples of a skin impression from the Paleolithic.

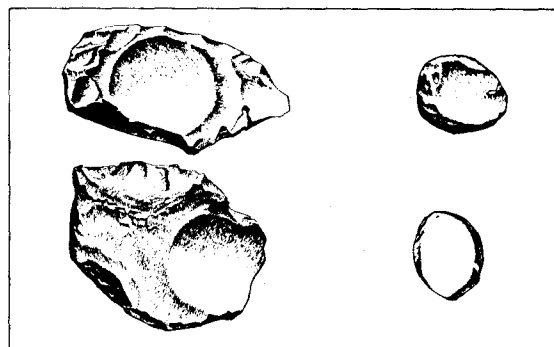
Putting together the data from all the sites at Kom Ombo, we are able to reach certain tentative conclusions about other aspects of the inhabitants' lives. First, there are no caves or sheltering rock overhangs in the surrounding cliffs, and

so all the living sites on the plain were in the open. At none of the sites have we found traces of permanent dwellings: stone or mud construction or postholes that would indicate substantial wood shelters. We can assume that the inhabitants built brush huts, windbreaks or light tents, shelters that would have left few traces, much as the modern Bushmen and Australian aborigines do.

Second, tools made of bone or horn are rare. Wood was probably used more generally, but no trace of wood implements has survived. The inhabitants of the plain did not have pottery, so that it also seems likely that they used containers made of skin, basketry, bark or wood. They probably made nets and lines for fishing and perhaps fowling. Again, however, none of these artifacts have survived. Whether the bow and arrow were present is not known, but the small stone points of several industries may well have served as arrowheads. Small flint blades may have been set into wood knife handles or fish spears. Dug-out or reed canoes and rafts would have been useful during the flood season, and perhaps for crossing to the west bank of the Nile, but again no evidence of such craft has survived.

Like most of the other Paleolithic peoples of the Nile Valley (but unlike many contemporaneous groups elsewhere), the inhabitants of Kom Ombo seem to have shown no interest in beads, pendants, bracelets or other personal adornments. Perhaps the red and yellow ochre found in some of the sites was used for body decoration. It is also possible that the spectacular plumage of such birds as the golden eagle, the osprey and the black kite, whose bones are found at the sites, were used for decorative purposes. We have no good evidence that any of the inhabitants engraved or sculptured bone and stone, as their Magdalenian contemporaries in Europe did. Their art, if they had any, may have been expressed in more perishable materials. Interesting scenes of wild animals, including cattle and hippopotamus, are engraved on the cliffs near our Gebel Siisila sites, but no one can prove they were the work of a late Paleolithic group. Physically the Paleolithic inhabitants of the Kom Ombo Plain were fully modern representatives of *Homo sapiens* and were apparently rather robust in build.

With the benefit of hindsight we can now see that many late Paleolithic peoples in the Old World were poised on the brink of plant cultivation and animal husbandry as an alternative to the hunter-gatherer's way of life. The new livelihood had its formal beginnings around the start of postglacial times in southwestern Asia and perhaps elsewhere as well. One current hypothesis about the origins of agriculture is that it was related to late Pleistocene population growth and increased pressure on food



GRINDING STONES are associated with Sebilian and Menchian artifacts. Some were possibly used to process wild plant foods. Stones at left are grinding slabs; those at right are rubbers.

resources. This, the hypothesis contends, led in some cases to the greater exploitation of foods that up to that time had been comparatively neglected, particularly plants, smaller animals, birds, fish and mollusks.

J. Desmond Clark of the University of California at Berkeley and others have recently argued that some evidence for this trend may be seen at Kom Ombo and elsewhere in the lower Nile Valley. Between 13,000 and 10,000 a.c. there appears to have been a general tendency toward population increase and more numerous and larger settlements. At some sites, particularly those of the Menchian and Sebilian cultures on the Kom Ombo Plain, we find many grinding stones: artifacts that suggest the processing of plant foods, perhaps even wild seed-bearing grasses. None of these grasses has yet been identified with certainty, although millets, sorghum and even barley have been postulated. At similar sites elsewhere in Egypt flint blades with a gloss or polish resembling that found on much used stone sickle blades have been reported. It has also been suggested that there may have been some tentative efforts at controlling or taming wild cattle, gazelles and other animals at about this time.

If there was such a trend toward the manipulation and domestication of plants and animals in Egypt at the end of the Ice Age, it would seem to have been a false dawn. We do not know much about human activities at Kom Ombo during the interval after 10,000 a.c. that is sometimes called the Epipaleolithic or Mesolithic. We do know, however, that a complex series of small-scale climatic and environmental changes took place. Contrary to earlier hypotheses, although there was a warming trend in Egypt at the end of the Pleistocene, it was not accompanied by either a sudden

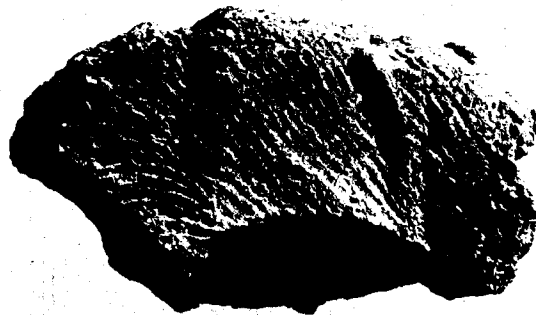
or a continuous period of desiccation. From about 10,000 a.c. until 3000 a.c. conditions fluctuated between the semiarid and the hyperarid. But no catastrophic drought, as some earlier archaeologists had believed, forced the hunter-gatherers out of the hills and plains into the narrow confines of the Nile Valley, where all at once, in propinquity with the appropriate plants and animals, they "invented" agriculture. Indeed, local rainfall seems actually to have increased for a time after 9000 a.c. and again about 5000 a.c.

Nevertheless, even though the tributaries continued their seasonal flow, the hydrological budget of the Nile itself now tended to be reduced as a result of climatic changes in East Africa. The river's floods were more restricted, the water table was lowered and the wetlands shrank in extent. Although there were still periodic fluctuations in the size of the Nile, conditions were never quite the same again at Kom Ombo. The plain seems to have become a marginal zone, unable to support a population as large as that of the late Paleolithic. Over the next few thousand years most of Kom Ombo slowly reverted to near-desert conditions; the ephemeral wadi waters gradually faded away, and sometime late in the third millennium a.c. the present hyperarid climate of Egypt became established.

We know that in other parts of Upper Egypt after 10,000 a.c., and in Lower Nubia as well, a hunting and fishing way of life continued for at least 4,000 years more, although its practitioners appear to have been reduced in numbers. At Kom Ombo too some hunting-gathering-fishing groups probably still lived on the western edge of the plain near the river. The general reaction of the inhabitants of the Nile Valley



HIPPOPOTAMUS JAW in a late Pleistocene deposit is cleared by author and a local worker. Presence of the animal four kilometers from today's Nile is evidence of swampy conditions.



IMPRESSION OF THE PALM OF A HUMAN HAND appears on a lump of hardened mud found in a Sabeikian deposit. It is a rare example of a skin impression from the Paleolithic.

to the changing environmental conditions seems to have been to place a greater emphasis on fishing and the procurement of other riverine foods in order to supplement the increasingly scarce supply of game animals and land plants. Possibly some of the brief hyper-arid periods after 10,000 a.c. led to a rapid reduction in the populations of these plants and animals. Unlike certain groups in southwestern Asia, however, the early Egyptians had not developed a sedentary way of life based on villages and on the collection of wild plants, which under conditions of demographic or ecological stress would have promoted the plants' domestication. If an indigenous trend toward plant and animal domestication developed in the Nile Valley at all, it apparently never passed the incipient level. Such a trend may, however, have helped to preadapt the Egyptians to a ready acceptance of food production later.

When diversified food production finally arose in Egypt, perhaps around 5000 or 4000 a.c., or at least 2,000 years after its development in western Asia, it was evidently introduced from outside and utilized the familiar animals (goats, sheep and pigs) and cereals (wheat and barley) domesticated long before in Asia. The imported plants quickly took the place of those indigenous to Egypt because they were more productive, particularly after the advent of irrigation. They and the imported animals provided the economic base for Pharaonic civilization, which emerged about 3000 a.c. Nevertheless, it is interesting to note that in the earliest Pharaonic era, that of the Old Kingdom, the Egyptians showed a lively interest in domesticating local animals—wild cattle, gazelles, antelopes and even hyenas—and continued to make use of cranes, geese and ducks in sacrifices and for food. The roots of this practice may lie in the preagricultural traditions of the Nile Valley.

In recent years prehistorians working in many areas of both the Old World and the New have uncovered a great diversity of human specializations and adaptations that developed in the closing phases of the Pleistocene. Our knowledge of the riparian hunters, fishermen and gatherers of the Nile Valley provides a valuable addition to the data on these processes of local adaptation. Although we should not exaggerate the role of environmental change in our attempts to explain cultural change, no one denies that there are close, if still poorly understood, articulations between the two, particularly at the hunting-gathering level of cultural evolution. What is being learned from the work on the Kom Ombo Plain and at other localities along the Nile should be of value to all prehistorians in search of the principles underlying the development of human behavior in the distant past.