

# Predynastic cultural ecology and patterns of settlement in Upper Egypt as viewed from Hierakonpolis

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## 1. Introduction

Laying approximately 650 km. south of Cairo and 113 km. north of Aswan on the western bank of the Nile, the site of Hierakonpolis<sup>1</sup> has played a critical role in the emergence of the Egyptian state around 3,100 B.C. Known to the ancient Egyptians as Nekhen and sacred to the hawk-headed god Horus of Nekhen, Hierakonpolis boasts a wealth of archaeological remains dating from Acheulean through Ptolemaic times. Perhaps the site is best known for its Archaic and Old Kingdom town and the huge Predynastic settlements and cemeteries which stretch for approximately 2.5 km. along the low desert on the edge of the modern cultivation and extend 3.5 km. into the Western Desert along an ancient drainage course known to archaeologists as the Great or Fort Wadi and, to local inhabitants, as the Wadi Abu Suffian. As one of the few spots in the world where we can identify the rise of an autochthonous national state — the first in recorded history — Hierakonpolis is of inestimable importance to those interested in the origins of complex social, economic and political systems that were the direct ancestors of modern states.

Archaeological research at Hierakonpolis began in the late 19th century and has continued, sporadically, throughout the 20th. The present research originated in the late 1960's under Walter Fairervis and was resumed in 1978, after an interruption of eight years. An interim monograph *The Predynastic of Hierakonpolis* was published in 1982 by The Alden Press, Oxford, England summarizing the 1978, 1979 and 1980 seasons.

This paper presents in condensed form our preliminary conclusions on three interrelated aspects of the Predynastic cultural ecology of Hierakonpolis: settlement

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patterns, environment and economy. Each aspect is considered as an "issue". It is hoped that further discussion of such issues will shed more light on the general processes of state development in the Nile Valley during the fourth millennium B.C.

## 2. Settlement pattern issues

There are four aspects of settlement patterns that are directly relevant to the reconstruction of a Predynastic settlement system: (1) regional variation, (2) inter-site variation, (3) intra-site variation and (4) the architectural competence. These are cross-cut by a fifth concern — chronology. At present, it can only be noted that an extensive suite of radiocarbon dates has placed our material between about 3,800 and 3,100 B.C. (MASCA corrected radiocarbon years).

Without doubt Hierakonpolis was a major population center during Naqada I (Amratian), Naqada II (Gerzean) and Naqada III (Protodynastic) times. While no systematic surveys have been conducted beyond the central core of our concession, visits to neighboring desert fringe areas by staff members and reports by local informants and the earlier work by W. Kaiser and K. Butzer suggest a lack of significant Predynastic settlement. Although this situation must be confirmed by future ground and aerial survey, for now we may treat the area in and around the Great Wadi (including the Dynastic town of Nekhen) as a major focus of settlement. To what degree the floodplain outside the walled confines of Nekhen and its two mound-like outliers might have been populated in Predynastic times remains unknown. Inspection of a drainage ditch and plowed fields between the present desert edge and the site of Nekhen and deep soundings within the later site have revealed Pre- and Protodynastic pottery, structures and graves. Thus, in the absence of a systematic sub-surface testing of the local floodplain, any conclusions we draw about regional settlement patterns are biased in favor of the desert.

Despite these limitations, we may describe with some accuracy the nature and extent of Predynastic settlement in the desert. From the beginning it must be recognized that the Predynastic settlement pattern in the Hierakonpolis is unique in that it is both perpendicular and parallel to the Nile. This pattern contrasts with that traditionally reported for Predynastic settlements and emphasizes the importance of the Great Wadi as a focus for settlement. Contrasting to the sand and silt-choaked wadis immediately to the North and South, the Great Wadi possessed sufficient gradient and protection from drifting sands to enable it to collect and efficiently discharge the minimal rainwater runoff of the light rains that fell at Hierakonpolis during at least the first half of the fourth millennium B. C. For this reason, we believe that the Hierakonpolis region offered a very special attraction to potential Predynastic settlers. By concentrating the economic advantages of a number of ecological niches within a small area near to the Nile, Hierakonpolis offered an opportu-

nity for people to complement the floodplain based and river-oriented economy with adjacent desert pasturages and provided clay, fuel and ideal locations to support a major ceramic industry.

Viewed broadly, the Predynastic desert settlement pattern at Hierakonpolis presents the aspect of large, "core" sites surrounded by "outliers" of varying size and function. Interestingly enough, this pattern anticipates that for the Archaic and Old Kingdom town of Nekhen, with its two outliers. If the settlement pattern with its hierarchy of sites distributed over the landscape displays the structural aspect of human occupation, then the various, inter-related functions of those sites reveal the organizational fabric of Predynastic society and economy. For instance, it is now possible to identify seasonal, transhumant, industrial, residential and perhaps even military and administrative aspects of Predynastic settlement organization — not to mention mortuary and ceremonial-religious systems.

Viewed through time, the following conclusions can be drawn about desert Predynastic occupation: (1) The greatest extent of occupation was reached in Naqada I times (ca. 3,800 - 3,500 B.C.) and covered an area of about 304,878 m<sup>2</sup>. (2) The greatest amount of site diversity also occurred in Naqada I times. (3) Definite Naqada II (as opposed to transitional Naqada I - II) occupation covered about 36,432 m<sup>2</sup>. (4) Naqada III occupation extended over only about 2,994 m<sup>2</sup>. These figures do not include the recently measured areas north of the Khasekhemui Fort but do give an accurate picture of the general trend toward the abandonment of the desert and the movement of the population center closer to the later site of Nekhen on the alluvium.

In Naqada I times there were two exceptionally large settlement centres (Fig. 1). The largest, traditionally known as the "Predynastic Town Site" embraces about 201,984 m<sup>2</sup> (not including outliers) and lies along and probably extends partly under the present borders of cultivation. The second major center, generally known as Locality 11, covers about 68,432 m<sup>2</sup> and lies at the mouth of the Great Wadi where it debouches from the sandstone hills onto the flat, Late Pleistocene silts of the low desert about 2 km. from the edge of cultivation. Both large centers are internally diversified and surrounded by smaller outliers. Excavations suggest that the "Town" site was more intensively occupied while Locality 11 acted as a secondary dispersal center for food procurement tasks (especially herding and dry farming) and pottery production (especially of red wares along the north bank of the nearby Great Wadi). A third function of Locality 11 involved servicing nearby cemeteries.

To understand the smaller outliers of the Locality 11 complex, we should visualize the flat, alluvial terraces of the low desert covered with clumps of tamarisk and acacia trees (especially the banks of the Great Wadi) and supporting seasonal plant communities sufficient to feed village herds, supply fuel for cooking and pot firing and attract occasional desert game. Nineteen different genera of plants have been identified from the Locality 11 excavations as well as a wealth of animal bone. The later suggest important differences between the two major centers in both the

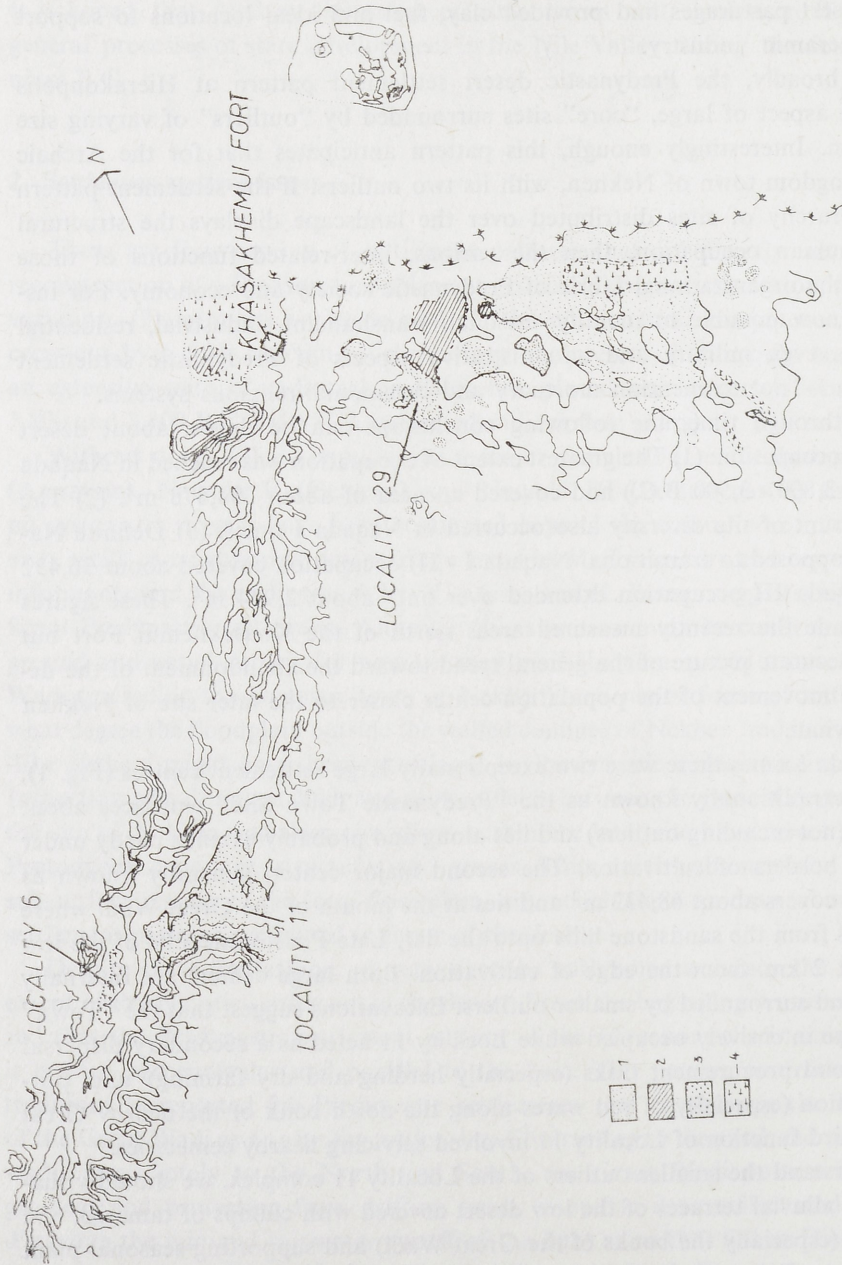


FIG. 1. Hierakonpolis. Map of Predynastic settlements and cemeteries

1: Early Predynastic settlements (ca. 3,800 - 3,500 BC); 2: Late Predynastic settlements (ca. 3,500 - 3,200 BC); 3: Proto-dynastic settlements (ca. 3,200 - 3,100 BC); 4: Cemeteries

composition and age profiles of domestic animals in Naqada I times. Locality 3, the farthest site from the borders of cultivation (3.5 km.) was an outlier of Locality 11 located at a fork in the Great Wadi. Its distinctive plan of circular huts arranged in a circle recalls transhumant cattle camps among contemporary Nilotic herding peoples. Locality 5 in a small feeder wadi was probably an individual homestead while Locality 60, a trash mound on the low desert NE of Locality 11, probably belonged to a small group of dwellings and was in an ideal location to exploit the open seasonal pasturages of that zone.

Both the size and number of outliers associated with the "Town" center were greater than those associated with Locality 11. Evidence for specialized industrial production is not limited to kilns as at Locality 11. In addition to a number of huge pottery kilns used to manufacture the straw tempered utilitarian and industrial wares of the day, stone vase and bead manufacturing areas have been identified. More will be said of the role of trade and presence of exotic raw materials when discussing economic issues. The abundant evidence for the subsistence economy unearthed in our excavations and identified by our archeo-botanist, Prof. Nabil El Hadidi, and archeo-zoologist, Prof. John McArdle, will be considered at that time as well.

By Naqada II times (ca. 3,500 - 3,200 B.C.) all desert settlement was restricted to a strip about 300 m. wide parallel to the edge of modern cultivation. Naqada II occupation covers an area of about 36,432 m<sup>2</sup> and (to date) consists of three principal sites. In at least one of those sites, there is clear evidence that the population was moving closer to the river from their previous Naqada I homes. There is thus clear evidence for continuity of population between Naqada I and II times — a fact that should lay to rest forever the old concept of Gerzean invaders. The settlement shift is mirrored in the relocation of cemeteries closer to the edge of modern cultivation.

The apparent concentration of Naqada II population near the edge of cultivation and in particular around Locality 34b (an impressive "stone mound") might be due to a number of factors acting either singly or (most probably) in combination. These include: (1) degradation of the fragile desert ecosystem by the use of trees and shrubs for fuel in the numerous pottery kilns and overgrazing by sheep and goats; (2) climatic deterioration involving the decline or final disappearance of the light seasonal rains of the Naqada I period; (3) military factors requiring more defensible population aggregates; (4) increasing emphasis on alluvium-based subsistence and manufacturing; (5) increasing emphasis on river transport, involving both trading and raiding and (6) the development of a ceremonial center — probably at the adjacent site of Nekhen — which served as a focal point for regional worship and social, political and ideological integration.

The population shift toward the alluvium continued in Naqada III times (ca. 3,200 - 3,100 B.C.). A total of three sites covering only 2,994 m<sup>3</sup> represent the de-

sert portion of the Naqada III settlement system. One exception to this are two apparent guard stations along The Great Wadi near the Locality 6 elite cemetery. Otherwise, the desert settlement pattern consists of a residential stone mound (Locality 25c (1) — a smaller and better-preserved version of Locality 34 b — and an adjacent, large rectangular structure (Locality 25 c (2) — probably an elite administrative building. A small earlier site (Locality 25) was used as a trash dump.

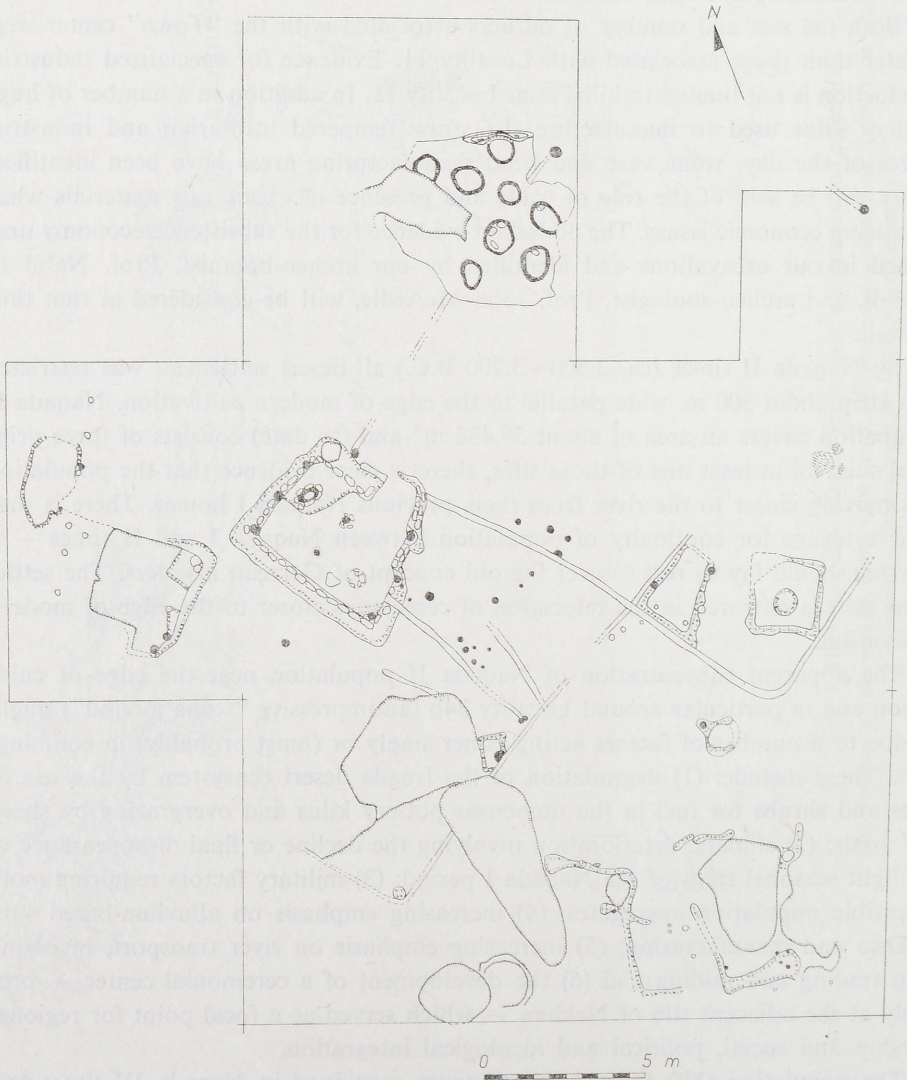


FIG. 2. Hierakonpolis, Locality 29. Plan of Amratian settlement

It is clear from our 1969 investigations at Nekhen that most of the population was now resident there during Naqada III times.

Finally, brief mention must be made of the knowledge gained of internal site variation and architectural units. At Locality 29, the most extensively tested site, 600 m<sup>2</sup> have been cleared and two principal occupation phases — both Naqada I — revealed (Fig. 2). The earliest phase (I) features an “open” or “barnyard” pattern with a rectangular, semi-subterranean house (4.0 × 4.50 m.) and associated outbuildings enclosed within a *zeriba* type fence. Appended to this complex was a pottery kiln, the fire from which ultimately caused the destruction of the rectangular dwelling. A number of other features and structures have been mapped and all the ceramics (over 357,000 sherds), part of the lithics (about 6,000 pieces), the botanical remains and faunal assemblage analysed.

Excavations at the Naqada I site of Locality 11 revealed portions of apparently circular post dwellings of substantial size and separate trash disposal and industrial (pottery kiln) zones. It has been shown that function — as much if not more than time — accounts for major differences within sites, including both artifactual and organic remains.

Although houses have been identified and mapped at ten sites, two Naqada I sites — Localities 3 and 49a — provide interesting complements to the data gathered from Localities 29 and 11. As mentioned earlier, Locality 3 consists of a circle of approximately 12 small, circular dwellings. These resemble the “hut circles” reported by Caton-Thompson from Hemamieh, at least on the surface. The average house size was 5.51 m<sup>2</sup> — a figure far below the average for rectangular structures.

Locality 49a consists of a grid-like arrangement of cobblesize rocks. As long ago as 1969 we noted the probability that such concentrations represented the deflated foundations of rectangular, agglutinated houses of mudbrick. To date we have mapped two rectangular dwellings and associated compounds, situated next to one another. Field observations and statistical calculations suggest a settlement of 10 or 11 houses packed tightly together. The house plans resemble those of Dynastic Egyptian peasant dwellings and the famous Predynastic house model from El Amrah.

A final type of structure, represented by previously-mentioned “stone mounds”, has been identified at Naqada II Locality 34b and Naqada III Locality 25c (1). In both sites, cobble-size rocks were used as building foundations. Although the mud mortar has long since disappeared, distinct rooms are often detectable. At Locality 34b large buildings were terraced against a low hill surrounding an open courtyard, creating the impression of a fortified compound. Although the walls were lower and structures less impressive, the Locality 25c (1) complex was also built on a low rise. Its many rooms give it the appearance of a maze, while a large rectangular structure nearby [Locality 25c (2)] may have been a palace or administrative building.

### 3. Environmental issues

Four environmental issues will be considered: (1) the question of regional boundaries, (2) the role of the Great Wadi, (3) climatic change and (4) the problem of "cultural biomass".

The regional boundaries of the socio-political unit of Hierakonpolis have yet to be defined archaeologically. We suspect they will correspond to natural geographic boundaries and correlate roughly with the borders of the Hierakonpolite nome in Old Kingdom times. More extensive regional surveys are being undertaken to solve this problem.

It seems apparent that the area around the Great Wadi was a major population center at least from Predynastic times. The unique effectiveness of this drainage and catchment system has already been mentioned. Protected from the accumulation of wind blown sand and having a comparatively steep gradient, the Great Wadi was able to concentrate and transport surface runoff to create a well-watered pocket of high biomass in the desert borderlands — a pocket that ultimately attracted Predynastic settlers. The presence of desert clays and rocky prominences exposed to the prevailing northerly winds also rendered it attractive to Predynastic potters intent on the production of fancy, mortuary wares.

The Naqada I settlement pattern can only be explained by increased rainfall producing additional runoff in the Great Wadi. Although the actual amount of rainfall may have been quite small, the fact that it occurred at all was enough to trigger responsive xerophytic plant communities and produce desert pasturages and, probably, permit the cultivation of a crop of barley. The 19 genera of plants found at Locality 11, including weeds, argue against the deliberate importation of the floral materials by man (also, the barley is unprocessed) and force us to admit the likelihood that increased rainfall permitted the extension of the floodplain flora onto the low desert — a phenomenon we were able to observe ourselves in 1980 after the two downpours of late 1979. It is possible that these rains were a terminal phase of the "Neolithic Subpluvial" and that their cessation forced the effective abandonment of the far desert after 3,500 B.C. It is also possible that this process was the result of environmental degradation caused by the pottery industry and overgrazing by village flocks and herds.

Finally, it is necessary to consider the effects of the cultural filter through which organic archaeological remains pass. It has been our aim to reconstruct what we call the "palaeo-cultural biomass" at desert sites where our 1969 testing revealed nearly perfect organic preservation. As already mentioned, we have found significant differences between controlled floral samples from different functional zones of the same site. This should caution against the facile reconstruction of palaeo-environments so characteristic of recent archaeological and palaeoclimatic research. Nevertheless, given proper preservation conditions and intelligent sampling procedures, we may be able to reconstruct the Predynastic biomass of the low desert.



This might be accomplished by noting the relative volumes and frequencies of plant and animal remains in functionally distinct zones of the same component, contrasting this information with dietary data provided by coprolite analysis and then comparing all data to contemporary plant density and consumption patterns after serendipitous rainfalls such as occurred in 1979.

#### 4. Economic issues

We define economy as the means by which people manipulate their environmental and cultural resources according to a mixture of socially-derived rules, norms and alternatives and individually-manipulated opportunities and possibilities. We will discuss three economic issues: (1) subsistence, (2) artifact production and (3) exchange.

Subsistence deals directly with food hunted, caught, collected, produced, processed and consumed. The archaeological evidence includes: wheat, barley, sycamore figs, cattle, sheep, goats, pigs, gazelle, hippo and fish. Wild plants and animals (with the exception of fish) played negligible roles in Predynastic diet although several wild and domesticated plants and animals not used as food played significant economic roles as artifacts (*e.g.*, flax for linen, grasses for mats and baskets, wood for beds, leather for rope and clothing) and means of transport (*e.g.*, donkeys).

The fact that plant and animal remains vary in distribution both within and between sites complements the artifactual evidence and suggests a complex division of labor organized around alternate strategies of food extraction, production and processing.

A complex division of labor surrounding artifact (craft) production is most apparent in pottery manufacture which attained truly staggering proportions during Naqada I times, being closely linked to environmental degradation, the mortuary and exchange system and the rise of elites. Other crafts included the production of stone vases, stone and shell ornaments, and maceheads; the weaving of baskets, mats and rope from local reeds and grasses; the manufacture of fancy chipped stone knives, "lanceheads" and animal effigies; the weaving of linen from flax and the carpenter's trade, which turned out well-fitted beds and boats which plied the Nile. Almost certainly, well-developed metallurgy and vase and mural painting should be added to this list by Naqada II times.

Exchange systems operated on at least three levels: (1) regional, (2) inter-regional and (3) international. In addition to the physical objects exchanged, we are interested in the social, economic, political and symbolic consequences of this activity. Ultimately, we want to identify the networks through which goods moved, the pattern of distribution of these goods with Predynastic communities, the volume of exchange and the ultimate effect of unequal or asymmetrical exchange on the grow-

ing division of labor, increasing military competition and the emergence of elites.

On the regional level, we have already noted differences in subsistence strategies between contemporary sites in the Hierakonpolis area and identified "industrial" and craft production *loci*. Such functional specialization pre-supposes local networks of exchange and re-distribution and probably markets. For the pottery industry, for example, there were doubtless economic arrangements for obtaining fuel, for manufacturing and transporting the finished products and, ultimately, for distributing these to customers for use in either utilitarian or mortuary contexts.

On an inter-regional level, Hierakonpolis was clearly a pottery production center. It is hoped that our quantification of almost 400,000 sherds and the micro-stylistic analyses currently in process as well as radio-chemical tests will identify scientifically the extent to which Hierakonpolis pottery was distributed throughout the Nile Valley. Other probable exports were groundstone vases and bowls, maceheads and stone beads. To date, we have identified unfinished porphyry maceheads at surface localities and clusters of stone vases and ornamental raw materials within several sites. These data are supported by earlier observations by Butzer (in the "Predynastic Town") and by Quibell and Green (within Nekhen) as well as our 1969 excavations at Nekhen. Other, more perishable, materials found in cemeteries (mats, rope, baskets, leather goods, linen and "mummi" resin) may also have been exports. Although much fancy, painted Naqada II pottery is generally regarded as an import, we wish to reserve judgement on this matter pending scientific tests. One clear import, however, was Aswan granite. This material was employed for milling stones in Predynastic times and was even found in unmodified boulder form in the fill of a large Naqada III stone-cut tomb (the earliest structure of its kind). The import of such material foreshadows the wholesale use and exchange of Aswan granite in Dynastic times for monumental sculpture and architecture.

Finally, we consider the international implications of Predynastic exchange systems. Most spectacular in this regard is a small lapis lazuli figurine found at Nekhen by Quibell and Green and Garstang. The material is probably derived from Afghanistan, although the sculptor was probably Egyptian. The date is probably Naqada III (Protodynastic). Throughout Egypt in Naqada III time (ca. 3,200 - 3,100 B.C.), there is also evidence for imported "Syro-Palestinian" or "Levantine" pottery and such ware has been noted recently by Williams at the Nubian site of Qustul, about 350 air km. south of Hierakonpolis. In Egyptian archaeology there has been a longstanding and somewhat counter-productive argument over the "origins" of many "foreign influences" in Naqada II and III times, including architectural styles and artistic motifs closely linked with the emergent kingship. I suggest that it would be most productive to abandon our search for a mythical "center of civilizational influences" in the same way that we have abandoned (hopefully) our search for a conquering "Dynastic Race." Instead, we must broaden our scope, both temporally and geographically, and inquire into the relationship between the

rise of elites and the growth of international exchange during the fourth millennium B.C. in a vast area extending from Greece in the West to the Indus Valley in the East. Such inquiries, I believe, will bring us back, ultimately, to the regional and functional contexts which led to the development of complex societies and force us to appreciate the diverse social, economic, political, environmental, ideological and even idiosyncratic processes responsible for cultural changes<sup>2</sup>.

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<sup>2</sup> Due to insufficient space and the primary nature of these data, footnotes and citations have been omitted. The general reader may consult the author's *Egypt Before the Pharaohs*, Knopf 1979, or *The Predynastic of Hierakonpolis*, Alden Press, 1982 for a general bibliography and discussion of the archaeological history of Hierakonpolis.