

Toward a model of agricultural developments in Predynastic Egypt

This paper presents a working model of agricultural developments in Predynastic Egypt. It is based mostly on the preliminary results of the excavations undertaken by Washington State University (F.A. Hassan, P. I.) in the Nagada-Khattara area in 1978 under grants from the National Science Foundation and the Smithsonian Institution, Foreign Currency Program. The excavations are a continuation of the work begun by T.R. Hays in the area in 1975.

As a result of the initial investigations by T. R. Hays (1976) numerous Predynastic sites were discovered in the area stretching from Danfiq to Ballas. These sites, consisting mostly of the remains of Predynastic settlements, were either ignored or overlooked by Petrie (1896). In 1978 an intensive systematic survey of the region in 40-200 meter grid units and a program of excavation were initiated by F. A. Hassan.

Radiocarbon dates on some of these sites indicate that the settlements span about 700 years from 5,270 to 4,400 uncalibrated radiocarbon years before present. The Delta and Fayum settlements predate the Predynastic sites of Upper Egypt by about one millennium (the earliest dates are $6,130 \pm 110$ B.P. at Merimde [Olsson, 1959] and $5,860 \pm 115$ B.P. at the Fayum [Wendorf and Schild, 1976]).

Our investigations indicate that the inhabitants of the Nagada region raised sheep/goats, cattle, and pigs, and that they cultivated emmer wheat and barley. The faunal remains indicate that there is a definite and dramatic change in the ratio of sheep/goats to cattle from the lower levels to the younger levels. The ratio drops from about 5 : 1 in the oldest levels at site KH3B to 1.05 : 1 at South Town. It is noteworthy that the ratio of sheep/goat to cattle in the upper levels is similar to that at Qena today, which is 1.2 : 1 (Dinasouri, 1957) compared with 4 : 1 in the desert provinces. Data from Pharaonic Egypt, and I am indebted to Professor Klaus Baer (*In Litt.* 10 Jan. 1980) for information on that issue, are scant and dubious, but they are in the range of 1.01 to 3.5 : 1. It is also interesting to note here that the ratio is 3.6 : 1 on Narmer's mace head and 5.3 : 1 in petroglyphs from Wadi Hammamat (Hassan, personal observations).

This temporal variation suggests that the early inhabitants of the Nagada region were most probably involved in a pattern of subsistence emphasizing utilization of desert resources since goat and sheep are better adapted to the desert than either cattle or pigs.

Evidence from the work of Professor Wendorf in the southern part of the Western Desert (Wendorf *et al.*, 1976) and the work conducted by F. A. Hassan at Siwa and Baharia oases (Hassan, 1978, 1980 a) document a phase of moist conditions from 9,500 to 6,700 B.P. (Wendorf and Hassan, 1980). This period was associated with human occupation of almost all Egyptian oases by Terminal Palaeolithic hunters and gatherers, and in the South by herders of cattle and sheep/goats and cultivators. Two varieties of barley, one of them domestic were also identified in a Neolithic context at Nabta playa in the south of the Western Desert dating to an average of $7,944 \pm 140$ B.P. (Wendorf *et al.*, 1976).

The moist phase was followed by a period of severe aridity which has most likely led to the gradual depopulation of the desert and an infiltration of the Nile Valley by individuals and families in a manner not unlike the modern dispersal of the Sahel peoples following the recent droughts in the area. Similar aridification seems to have affected the Sinai and the Negev, and a similar movement of population toward the Nile is plausible. This was no mass invasion, but a gradual infiltration by drifters and refugees over a span of about 500 years or more. These groups intermingled easily with the local inhabitants of the Nile Valley who were at the time hunters, gatherers, and fishers (Hassan, 1980b) with a flexible social organization and presumably exogamous marriage pattern, as among most hunter-gatherers. Agriculture therefore did not displace the pre-existing subsistence patterns but supplemented it. The change in subsistence was almost imperceptible peaceful, and gradual. This model explains why agriculture appeared in Egypt when it did, and how it was introduced without assuming any deliberate choice on the part of the Nilotic inhabitants. The people of the Nile must have been aware of the agricultural practices in the desert areas and in the Near East, and probably occasionally utilized wild grain and may have in fact tended some plots of barley at the edge of the floodplain perhaps as early as 18,000 years ago (Wendorf *et al.*, 1979). The Nilotic people were engaged in a profitable and predictable subsistence pattern oriented toward hunting cattle, hartebeest, capturing hippos, catching Nile fish, and gathering Nilotic plants. The sufficiency of the Nile habitat as argued by J. Desmond Clark (1971), and the stability of the Nilotic resources compared to those of the Near Eastern mestastable rain-governed resources was probably not conducive to an autonomous change toward cultivation as a means of securing additional food or a further stabilization of the economic base.

Once the new elements of subsistence and other cultural traits were incorporated in the Nilotic cultures they diffused along the Nile. There are indications that one of the directions of the spread of agriculture was from the Delta southward. The Khartoum Neolithic seem to have been either indigenous or derived from adjacent sources of the

Sahelian belt. The Shamarkian Neolithic seems also to have been affiliated with the Neolithic of the region of Nabta Playa.

The results of botanical investigations indicate that barley was the most dominant cultigen with a frequency twice that of wheat. This is in marked contrast with the present dominance of wheat over barley. In 1950 - 1954, the acreage under barley was 7.2% of the combined acreage for wheat and barley (Mabro, 1974: 50). This compares with 30.9% in 1899 - 1900 (Selim, 1940: 16). In 1875, barley amounted to 31.8% of the combined produce of wheat and barley (McCoan, 1882). Data on earlier periods has not been collected yet, but barley was still the most common cultivated plant at the time of the Napoleonic invasion of Egypt. The minimal emphasis on barley today reflects thus a progressive replacement of barley with wheat, most probably in association with the advances in perennial irrigation (beginning in 1825/34) and other water controls. Under conditions of natural irrigation the predominance of barley is understandable given the greater resistance of barley to drought and salinity. It is interesting to note that the only other quantitative estimate of cereals from the Fayum Neolithic (Caton-Thompson and Gardner, 1934) closely matches that from Nagada. Barley at the Fayum represents 72.3% compared with 70.7% at Nagada.

Our work on Predynastic agriculture, as I have mentioned earlier, represents a basis for higher level interpretations of the causes for the emergence of political hierarchy and centralization that culminated ultimately into the emergence of the Egyptian State. Once agriculture became the dominant mode of subsistence with an attendant reduction of spatial mobility, and enlargement of group size, and a simplification of the ecological network by focusing on a few resources the economic system became vulnerable to periodic fluctuations in agricultural yield. Given the unpredictability of Nile floods and the fact that about one of every five floods is a "bad flood", emergence of intraregional and interregional networks of food exchange fostered the emergence of a managerial elite, formal social organization, and military force. The emergence of regional political units with distinct group ethnicity paved the way toward the enlargement of the political framework to include other units through alliances and conquests to ensure the regular flow of resources. It must be also noted that once a differentiated elite emerged with greater access to wealth and power it began to guard its own interests and aggrandize its own gains. The expansion of trade in non-food goods was thus attendant upon the rise of an elite and status differentiation.

The emergence of the religious component in Predynastic cultures may be also viewed as an expression of the psychological and metaphysical response to the greater anxiety associated with the unpredictabilities of the incipient agricultural system.

In summary, the emergence of agriculture in Predynastic Egypt was a result of demographic fusion between the inhabitants of the Nile Valley and refugees from the desert regions adjacent to the Nile Valley from ca. 7,000 to 6,000 B.P. and the

subsequent diffusion of agricultural practices along the Nile. The subsequent evolution of Predynastic culture was essentially an expression of a trend toward greater integration of the resources of food producers within and among Nilotic communities in order to stabilize the economic base and secure it against adverse fluctuations of Nile floods and other agricultural failures¹.

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