The Historical Approach to the Study of Societies and their Environment in the Eastern Upper Nile Plains.
Douglas H. Johnson

Résumé
D. H. Johnson — L'approche historique dans l'étude des sociétés et de leur environnement des plaines inondées du Haut-Nil. La prise en considération des facteurs écologiques, plus spécialement de la climatologie et, surtout, de l'hydrologie (hauteur et durée des crues et étiages) est indispensable à la compréhension des mouvements historiques des peuples de langue nilotique, ainsi que de leur répartition et de leurs relations actuelles. La tâche majeure des historiens consiste sans doute dans l'étude des diverses façons dont elles ont réagi aux changements de leur environnement, tant sur le plan de l'adaptation de leurs genres de vie que sur celui de l'organisation sociale et des rapports entre ethnies.

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The question has been posed: how does the historical approach contribute to a knowledge of the relationship between societies and their environment, and in particular how does historical analysis affect the use of models and general typologies applied by some of the social sciences to African societies? This question is of particular relevance to the study of the Western Nilotic-speaking pastoralists in the eastern upper Nile plains of the Sudan. There is quite a body of secondary literature concerning anthropological theories of environmental determinism in relation to the historical event of Nuer expansion in the 19th century.¹ This literature has not yet discussed specific variations in the environment or historical occurrences of environmental changes (floods, droughts, etc.) to see how such variations and events may have influenced the history and development of Nilotic societies. Rather there has been a tendency to try to identify enduring social (or social anthropological) laws arising out of the facts of pastoral economics or segmentary political organization, irrespective of the specific environment. The historical facts of Nuer expansion have been given an ahistorical explanation in these studies. They have left the question of why the event happened when it did unanswered. In so doing they leave the event largely unexplained.

There has been a parallel interest among historians in the spread of Luo-speaking societies throughout East Africa. Earlier studies focussed mainly on the problems of chronology and the itinerary of

¹ Some of the main arguments in this literature can be found in Sahlins 1961; Newcomer 1972; Glickman 1972; Southall 1976; Sacks 1979; Burton 1981; Kelly 1985. Most of these authors treat the environment of the region in a very generalized way. Only Southall has emphasized the importance of examining local variations, but he himself lacked the data to make such a study. Sacks has also emphasized the importance of taking into account the intervention of external forces, but she, too, lacked the historical data to carry through with this point.
Recently there has been a growing interest in correlating the chronology of environmental changes with the history of the expansion and contraction of many East African peoples. This reorientation of East African history has been made possible by the combination of several different types of sources, none of which by itself could provide an adequate historical reconstruction of a society's relationship with its environment. Archaeology and historical linguistics have been able to present new information about the continuity and development of the economic activities of early societies; the study of oral traditions has provided a general outline of events still retained in the historical memory; and the historical study of meteorology and aspects of hydrology has helped to reconstruct, in general terms, a chronology of environmental events in the area.

The study of East African societies has combined the study of external and internal factors by drawing upon both external and internal sources. This combination has been absent in most of the recent theoretical studies of the Western Nilotes of the upper Nile plains. Anthropological models have largely excluded the details of specific events—both political and environmental—from their data. The ahistorical nature of many recent anthropological writings has produced an incomplete explanation of the internal dynamics of Nilotic societies and their relations with one another. The correlation of historical data on the upper Nile environment with internal historical evidence of how Nilotic societies have responded to that environment forces us to present Nilotic history in a different way. It is possible to suggest that the ways in which Nilotic societies have responded to environmental changes and to one another constitute the main part of their history.

Evans-Pritchard's pioneering and perceptive study of Nuer ecology emphasized the restrictions the environment imposed on the social horizons and activities of each local community. Some recent commentators have sometimes amplified these observations by suggesting that each Nilotic society fills and is bounded by its own 'ecological niche' within the plains. The longue durée of environmental history does not really allow us to impose such rigid segmentation on Nilotic societies. Their exploitation of the environment, the role they play in their own ecology, require them to be both fluid and flexible. The composition of each society has had to change. Such changes have altered not only internal relations between segments of a society, but external relations between communities as well.

In attempting to outline an answer to the question of how the histor-

ical approach contributes to our knowledge of the relationship between societies and their environment in the eastern upper Nile plains, I can give only a brief survey of how environmental changes correlate with human history in the region. This is based on studies that will shortly appear elsewhere. I hope to indicate that while local societies are restricted by the environment of the plains, their responses to those restrictions have been varied. Society as a whole, and the individuals contained within it, are presented with a variety of alternatives. How they respond to those alternatives helps to formulate their relationships. In focusing on the environment here, I am not implying that other historical factors (such as the intervention of external States) have had no, or little, impact on Nilotic history. But once we achieve a better understanding of the ecological history of the area, we may also begin to have a better understanding of the complexity of its political, economic and social history.

The Environment of the Eastern Upper Nile Plains

The central swamp of the upper Nile overflows both to the west and the east. The eastern plains (which will be our main concern) are bounded on three sides by the Bahr al-Jabal, White Nile, Sobat and Pibor rivers. The plain itself is intersected by a number of seasonal watercourses which at times feed and are fed by the main river systems. The plains are mainly flat with only slight elevations; the soil is mostly cracking clay which is almost impervious to water at the height of the rains. There are a few sandy outcroppings of elevated land, mostly around the confluence of the lower Sobat, the White Nile and the lower Bahr al-Zaraf, as well as on the west bank of the Bahr al-Jabal, and along a series of ridges and knolls stretching from the Sobat mouth to the Bahr al-Jabal around Bor. The banks of the Sobat river (fed by the Ethiopian rains) are steep and rarely overflow. The banks of the Bahr al-Jabal and Bahr al-Zaraf are low and these rivers overflow into permanent swamps. The channels through these swamps are constantly changing, so that the configuration and extent of the swamp itself changes regularly.

The plains are subjected to a seasonal alternation between drought and flood, the flood being produced by a combination of local rainfall and river flooding from the main river systems. The Bahr al-Jabal system is fed by the East African lakes, and at the height of the flood spills out through the swamps into the grasslands. Water from the Sobat river enters the plain as it backs up into and spills out of the seasonal watercourses. There is also an occasional overspill from the Pibor river system to the south and east. River flooding combines with rain flooding (standing water on the clay plain), and in years of exceptionally high rivers and heavy rains there can be the added hazard of a
‘creeping flood’, moving across the plain from the south and east until it reaches the major watercourses, which then flow into the Sobat as its level drops.

Because the topography of the area is flat, offering little control to the flood waters, every shallow depression becomes a seasonal lake, every slight elevation becomes an island and a potential site for permanent settlement. In the dry season the floods slowly recede and the plains dry out. People move their cattle into the pastures as new grass is revealed. The distribution and concentration of dry-season cattle camps are influenced by the expanse of pastures which the receding floods give up, and by the availability of water in inland pools and watercourses. Though general patterns do repeat themselves over a period of time, each year can present a different configuration of pastures and water. Therefore, the inhabitants cannot anticipate with certainty where they will be able to settle and graze from one year to the next.

The hydrology of the region is thus crucial to human settlement. If the river has a sustained rise in the wet season, then many riverine dry-season pastures may remain flooded and unusable for most or all of the year. A prolonged high level of flooding over several years can also make settlement sites near the river untenable or inaccessible, forcing people to move. Since much of the water is retained and dispersed throughout the swamps, the fluctuations in river levels have varying effects on the surrounding countryside. Even a succession of low rivers can produce local flooding. The river channels through the swamps surrounding the Bahr al-Jabal and Bahr al-Zaraf quickly become clogged with vegetation when the river is low, and this can create an obstruction which forces water to back up above it into areas adjacent to the swamp. The size of the swamp itself, and therefore the extent to which the grasslands are flooded, can rise and fall with the levels of the East African lakes; a fluctuation which is reflected in several centuries of Nile measurements at Rhoda in the Egyptian delta. But lake levels by themselves do not determine the size of the upper Nile swamps. The area of permanent swamp increased dramatically in the early 1960s, in line with the severe rise in the East African lakes, but the swamp has not receded with the subsequent reduction of the lake levels, and remains at an abnormal size.5

With so many areas liable to flooding, crops are frequently vulnerable. Only a few ridges overlooking the banks of the Sobat and White Nile are so positioned as to provide reasonable security from annual floods, and also retain access to water during the annual drought. It is the drought which provides the second seasonal threat to cultivation; light or ill-spaced rains can also ruin crops. The capriciousness of the environment also

5. For a description of the hydrology and ecology of the region, see Sudan 1954a; Howell & Cobb 1987.
Pre-1961 extent of swamp and river-flooded grassland

Probable maximum extent of 'creeping flood'

Post-1961 extent of swamp and river-flooded grassland

Eastern upper Nile plains. (Source: Derived from Sudan 1945b.)
demonstrates itself through the uneven distribution of its effects. One area might be completely flooded out, while another area is stricken by drought, while yet another produces an abundant harvest, all in the same season. It is because of this capriciousness that the majority of the population of the plains must combine animal husbandry with cultivation.

The Environment and Long-Term Population Movements

The variability of floods and rainfall, and a reliance on livestock mean that the majority of the people in the plains must move, not only in the regular pattern of annual transhumance, but in major adjustments to both short-term and long-term trends in water distribution and pasture availability. Movement and temporary settlement are a habit; it does not need a major environmental change or disaster to extend the radius of habitual movement or point it in a new direction. Even temporary degradation of the local environment (such as the encroachment of the swamp into former pasture areas) can be the trigger for long-term resettlement.

It is by looking at the recorded succession of periods of high and low rivers, in conjunction with the known historical traditions of the Shilluk, Anuak, Dinka and Nuer, that we can begin to discern a pattern in the movement of peoples in the eastern plains in response to specific periods of environmental change. We can infer from some of the early nilometer records that there were a number of extensive droughts in the Southern Sudan, some perhaps lasting decades, between 750 and 1450 A.D. This could account for a period of continual movement of small groups of Nilotic-speaking pastoralists within and beyond the eastern plains, a movement suggested by some archaeological evidence as well as by the historical traditions of a number of Luo-speaking peoples. The upper Nile swamps would have contracted during these periods, allowing for the proliferation of scattered settlements closer to the river than was possible during earlier periods of higher discharge. This succession of droughts was then followed by a relatively stable period from about 1450 to 1800 A.D. Movements in this period would not have had to be so extreme or so constant, and conditions for both cultivation and herding would probably have improved in some areas. There could have been a sustained population growth in some parts of the region, especially along the ridges of elevated ground.6

It is in this context that we can understand the establishment and control of Shilluk and Anuak settlements along the White Nile and the

6. See JOHNSON 1987b. There is some disagreement over the precise dating provided by the nilometer records, but the general pattern of extended droughts and floods has not been challenged.
Sobat-Pibor from the 16th to the 18th century. This was not so much a sudden and mass migration as a consolidation of the riverine population around the institutions of the Shilluk king and the Anuak headmen and nobles (Johnson 1986a, 1987b). Towards the end of this same period there also appears to have been a spread of Dinka-speaking communities throughout the eastern plains. These communities eventually spread north into the White Nile valley, where they controlled the territory between the east bank of the Nile and the Sobat, and west into what is now the Bahr al-Ghazal, onto the edge of the ironstone plateau. The Dinka explanation of the process of their own expansion and migration is that their political groups segmented as they increased in size and expanded over larger territory. Segments moved away from the parent body as they became larger and better able to look after their own needs. In finding or dominating new wet-season camps and dry-season pastures they in turn attracted more settlers. The original settlers occupied the best-drained land, leaving the more marginal areas to newcomers who, as their own numbers grew to the point of straining their more limited resources, moved off in search of new territories for themselves. Once successfully settled elsewhere they, too, attracted new settlers from other groups. In the process of migration and resettlement, the composition of each tribal group changed, and changes, for each is merely a temporary collection of individual groups within a well-defined territory (Lienhardt 1958: 114-116; Johnson 1987b).

The above indigenous model cannot, of course, be employed to explain all cases of Nilotic segmentation or resettlement. But it does seem to have wide applicability. There are indications in the oral traditions of both the Dinka and the Nuer that this process did help to spread the Dinka population thinly across the eastern plains by the end of the 18th century, and that the same process was involved in sending the Nuer eastward at the beginning of the 19th. The balance of the Dinka-speaking population shifted throughout the 18th century, until its largest concentrations were no longer in the eastern plains, but to the north and west. They were, in other words, moving out of the plains. The Nuer, in the meantime, had been largely contained within the triangle of seasonal and permanent swamps between the Bahr al-Ghazal and Bahr al-Jabal rivers. During the first quarter of the 19th century there was a period of low Niles, drought and famine throughout the Sudan and in adjacent countries. It was at this time that the pattern of swamps shifted along the west bank of the Bahr al-Jabal. In some areas there was excessive flooding due to water backing up behind vegetation blockages in the abnormally low river. In other areas the river dropped to a level where it ceased to be an impediment to eastward movement. The west, however, was blocked by the new concentrations of Dinka. Nuer who tried to raid to the west were decisively defeated. It was far easier to move east, into the less densely settled lands of the
Zaraf island or the Sobat valley. Some of the earliest Nuer settlements on low-lying land in the east were then flooded out by the general rise in the level of the Nile in the 1840s—thus forcing the Nuer even further east.

Throughout the last half of the 19th century this process continued with a series of sustained floods. Each time riverine settlements were flooded out, people had to move further east, sometimes following internal feuds over pastures and permanent settlement areas. When the waters subsided old settlements were reoccupied, but the new eastern settlements were not abandoned. Each succeeding flood left the Nuer more concentrated around and beyond the new 'high-water mark'. The plains east of the Duk ridge are generally subjected to less violent extremes of flooding than the area adjacent to the permanent swamp, and therefore it is a good refuge from excessive flooding. But the corollary of this is that the area suffers from extremes of dryness in the dry season: the pastures and watering places are scattered and distant from the permanent settlements and more extended movements are needed to reach them. The inhabitants of the far eastern half of the plains have thus been required to make constant movements out of it, to the east, north, south and even back to the west (Johnson 1982: 184-191; 1987b).

It is in the two apparently opposite results of Dinka and Nuer expansion in the eastern plains that we can discern a similar pattern which links them, at the same time, with the earlier Luo migrations. The great swamps of the Bahr al-Jabal and the plains immediately to the east and west are an unstable area in which to live because of what can only be called a persistent pattern of erratic flooding. Most of the peoples of the region are pastoralists. They rely heavily on pastoralism in part because the floods make crop production unreliable, and their particular mode of pastoral mobility has been developed in direct response to both seasonal and long-term changes in the water and vegetation distribution. It is not pastoralism alone that keeps the people moving. It is mainly the environment which has made movement and resettlement a constant fact of life. The historical pattern of flooding, which produces an ever-changing mosaic of water-logged and dry areas, continually draws people into and out of the eastern plains. They circulate there, some settle, and some leave to settle along and beyond its fringes. Within the discernible historical record of the last four centuries or so this has happened with the Luo (Shilluk and Anuak), the Dinka and the Nuer. They have moved in different ways, they have sometimes settled in different places, and they have also sometimes competed for the same area. But they are all part of the same historical pattern of movement in response to the environment. To pretend otherwise is to overlook the very context of their history.
Economic Differentiation and Interdependence

There has been a temptation in some anthropological commentaries to see in the ethnic differentiation of the peoples of the eastern plains an economic differentiation and specialization as well. The Nuer are presented as herders *par excellence* who have come to dominate their ecological niche more efficiently than anyone else; the Shilluk and Anuak are seen as cultivators and fishermen; while the Dinka seem to be classed as second-class pastoralists. This arises in part from a rather distant appreciation of the settlement patterns and economic activities of the peoples of the region. Different areas of the region are more favourable for some economic pursuits than others, it is true, but it is not true to say that such areas are monopolized by one ethnic group only. It is also misleading to suggest that each ethnic group is self-contained in its economic activities. Because of the flooding pattern described above, not only are different peoples mixed within the same territories and even villages, but all peoples have had to develop ways in which they can draw on the resources of areas at some distance from their own territory. This is clearly demonstrated by the historical study of floods in the 19th and 20th centuries.\(^7\)

One result of the fighting which followed the Nuer invasion of the eastern plains was that peoples of different origins are to be found within the territory of any one political group. This is equally true of the Dinka, to the south of the Nuer, and of the Nuer themselves. Any spot which can be occupied is occupied. The Dinka were never completely expelled from the lands the Nuer now occupy. Dinka and Nuer are often found in the same village. Enclaves of foreign lineages or peoples can also be found within the wider territory of another group. Just as some groups of Dinka have lived surrounded by the Gaawar Nuer for nearly a century and a half, so occasionally Nuer lineages have lived in independent harmony within Dinka territory.

The consequence of this is that there was never a fixed ethnic or kinship boundary. The Nuer and Dinka were not sealed off from one another by a fixed barrier of hostility. Hostility there was (and still often is), and raiding there was. But this hostility was frequently overcome, and in the long run modified, by an expanding network of kin ties which in many areas brought Nuer and Dinka communities closer together.

Hunger was a constant incentive in the maintenance and expansion of this network. In both Dinka and Nuer societies one frequently has recourse to one’s kin in times of personal scarcity, and it is to them one turns for cattle, seed or grain. But when an entire locale is struck by

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7. The information for this section comes mostly from JOHNSON 1987a, 1987b. ftcheg.
the same difficulty, as when drought or flood destroys the crops, then one’s immediate kin can be of little help. It is then that more distant kin must be called on. It is precisely in this way that the Dinka of the late 19th century began to revive when deprived of their pastures, herds and even villages by a conquering band of Nuer. Dinka captives among the Nuer were the link by which other Dinka entered Nuer society, usually to obtain relief from Nuer raids or local scarcity. Sometimes the Dinka came to settle, sometimes they returned to their own communities. Marriage with the Nuer helped to ensure that the Nuer could be applied to for relief in the future, so there was a growing exchange of brides and cattle between Nuer and Dinka communities. This established reciprocal relations, so that Nuer, too, could come to their Dinka relatives in their own times of need.

The maintenance of these reciprocal obligations for future security was one way in which disruptive hostility was reduced and the population of the region continued to circulate within and between ethnic groups. The network was reinforced and expanded after every major natural catastrophe of this century, when widespread flooding, recurrent cattle epidemics (sometimes intensified as a consequence of the floods), and intermittent droughts so reduced local resources that individuals and whole communities had to seek assistance far beyond their immediate social boundaries. The Nuer have frequently had to take their cattle to the pastures of Dinka relatives, or seek grain from Dinka neighbours, as their Dinka kin have had to apply to them. Shilluk and Nuer living on opposite banks of the White Nile have also had to develop something of the same reciprocal relationships. Exchanges of grain and cattle have, at different periods in this century, linked communities quite distant from each other, so that from time to time peoples of the eastern plains have had access to relative surpluses in the White Nile valley, the upper Sobat valley, and even north of the Sobat along the Ethiopian border (Johnson 1986b: 231-240; fthcg.).

The kin network has also helped persons to resettle when faced by intractable alterations in the environment. Again, during and after every major period of sustained flooding in this century those communities living closest to the Bahr al-Jabal swamps have frequently had to move their cattle, and sometimes themselves, to less flooded lands further east. During the major floods of 1916-1918 and 1961-1964 the Gaawar Nuer had to send their cattle east to pasture with the Lou Nuer; they had often allowed Lou Nuer sections to come to their pastures during excessively dry spells in Lou country. Of more significance, after 1961 whole families of Dinka moved not only their cattle, but themselves, to Lou country, where they now live—as Nuer. Thus the continuation of flooding reinforces the historical pattern we have already described, moving people constantly eastward into and through the plains.
By alluding only briefly here to other published works which throw light on the historical facts of the environment of the upper Nile plains, I have tried to demonstrate why I think that the study of local responses to that environment is of crucial importance for understanding not only the history of Nilotic peoples, but their current organization and activities. A detailed discussion of the complexities of that environment and a thorough analysis of that history are beyond the scope of this article. But this article should serve as a warning that any discussion of Nilotic history, economy, and political or social organization must be founded on a thorough understanding of the environment and the variations within it.

It may be true in very general terms that, throughout the great expanse of the upper Nile swamp and its adjacent plains, the component parts of its ecology are basically the same and do not alter dramatically. The differences are significant nonetheless. It is the combination of soil types, vegetation, elevation and water availability which affects human settlement and activity, and the eastern plains alone present many local variations in this combination. The Bahr al-Jabal and Zaraf valleys are particularly favoured with elevated sandy areas, access to water, and the best grasses for dry-season pastures. They are also particularly vulnerable to flooding. This is demonstrated by the fact that some of the areas of the Zaraf valley and the Zaraf island which were densely settled at the beginning of this century have been under water now for over twenty years. The eastern lands, now occupied mainly by the Lou Nuer, are less frequently susceptible to excessive river flooding but present more extremes of aridity during the dry season. They frequently receive an influx of peoples from further west, as either temporary or permanent residents, but the momentum of that eastward movement is often maintained by the conditions of the plains themselves. In the last twenty years the Lou Nuer have received many newcomers from their Dinka kinsmen and neighbours, but during that time the Lou have also moved further east. The area around Akobo, which was Anuak territory for most of this century, has become Nuer only in the last few years.

Thus we see that both historically and seasonally the movement, settlement and mixing of populations has been regularly influenced by environmental conditions. The Zaraf valley is a favoured area for grazing and settlement when the rivers are at a safe level; the eastern lands are preferred when the rivers are dangerous. Both areas alternatively attract and repel the peoples who live in them. Both areas provide a variety of places more suited for either crop production or
grazing, but whose suitability is enhanced or diminished by changes in environmental conditions. The basic instability of the environment is understood by those who live there and experience it. For scholars, however, this fact perhaps can be fully appreciated only by keeping the history of the area strictly in mind.

University of Durham,
St. Aidan's College, April 1986.

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