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THE PEOPLING OF THE TIGREAN PLATEAU IN ANCIENT AND MEDIEVAL TIMES (ca. 4000 B.C. - A.D. 1500): EVIDENCE AND SYNTHESIS

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INTRODUCTION

This paper is aimed at outlining the dynamics of the peopling of the Tigrean Plateau and adjacent lowlands from late prehistoric to medieval times (ca. 4000 B.C.-A.D. 1500).

The region under examination is an environmental mosaic with four main physiographic regions: 1) coastal plains, 2) eastern slopes of the plateau, 3) Tigrean Plateau, and 4) western lowlands. On the coastal plains and eastern slopes of the plateau the climate is arid and semiarid with winter rains. On the plateau and in the western lowlands the climate is temperate and semiarid with summer rains. Climax vegetation ranges from semidesert scrub on the coastal plains to steppe thorn woodland on the eastern slopes. Woodland and savanna are found along with forest on the plateau, and grass savanna exists in the western lowlands. Wild fauna include gazelle, ostriches, and pythons on the coastal plains; elephants and antelopes on the eastern slopes and the northern plateau; and elephants, antelopes, gazelles, rhinoceros, giraffes, lions, leopards, and warthogs in the western lowlands. Fertile soils suitable for cultivating cereals occur on the plateau (teff, barley, wheat), and in the western lowlands (sorghum, millet). Good pastures occur on the eastern slopes and in the western lowlands (see Wolde Mariam 1972; Ethiopian Mapping Agency 1988; Fattovich 1993a).

The region has been exposed to many environmental hazards: earthquakes, desertification, drought, famine, locust swarms, and epidemics, as well as invasions (Relief and Rehabilitation Commission 1985; Ethiopian Mapping Agency 1988; Zein and Kloos 1988).

The climatic history of the region is most likely consistent with that of Northeast and East Africa. A moist warm climate, with minor dry fluctuations, prevailed in the early Holocene. Since the 4th millennium B.C., present climatic conditions gradually emerged, with a pronounced arid period ca. 2500-1500/1000 B.C. (Grove 1993). Present-day climate and

rainfall have been established since the 2nd millennium B.C., with a minor humid period ca. 500 B.C.- A.D. 500 (see Gasse, Rognon, and Street 1980; Hassan 1981; Butzer 1980, 1981).

Modern peoples of Tigray and Eritrea include Semitic (Tigrean, Tigrè, and Arab), Cushitic (Beja, Agaw, Saho), and Nilo-Sahelian (Kunama, Nera) populations (Conti Rossini 1937; Ullendorff 1973). They practice three main systems of food production (see also Brandt 1984). Most Semitic- and Cushitic-speaking peoples of the plateau cultivate wheat, barley, teff, and finger millet on terraces with a very primitive plow, and sometimes use artificial irrigation; they also breed cattle, sheep, and goats ("plow and cereal complex"). Nilo-Sahelian-speaking peoples of the western lowlands cultivate sorghum with a hoe or a digging stick, and breed cattle and small livestock ("hoe and cereal complex"). Semitic -and Cushitic- speaking tribes of northern, eastern, and western Eritrea breed camels, goats, sheep, and cattle with seasonal movements from the lowlands to the plateau ("pastoral complex"). Exchange is the main form of interaction among the different populations. Sometimes herders provide farmers with the care of livestock. Until recently the populations of the plateau raided the lowlands to obtain slaves and livestock (see Pollera 1935).

The modern pattern of peopling was firmly established in the last three/four centuries (see Conti Rossini 1913a; Pollera 1935). This pattern was the result of a long process of environmental adaptations and socio-economic transformations that started in the middle Holocene, when food production was introduced in the lowlands and the plateau.

The reconstruction of this process is crucial to explain how different adaptive strategies emerged to cope with environmental and cultural change, and how such strategies could be used to cope with future problems. In such a way, archaeology and history may also contribute to the present development of northern Ethiopia (see Dramis and Fattovich n.d.).

Evidence

Archaeological, historical, and linguistic evidence can be used to reconstruct the history of peopling of Tigray and Eritrea from late prehistoric to medieval times.

1. Archaeological evidence

Tigray and Eritrea, including the Sudanese borderland, are very rich in archaeological remains. These remains consist of Middle and Late Paleolithic stone tool industries, Neolithic and late prehistoric sites, late prehistoric and early historical rock-art, Pre-Aksumite and Aksumite historical sites, medieval rock-hewn churches, early Islamic cemeteries, and tombs of uncertain age.

This region is largely unexplored archaeologically. Most sites have been recorded, but never properly investigated. Only five sites have been extensively excavated: Aksum, Yeha, and Matara on the plateau; Adulis on the coastal plains; and Mahal Teglinos in the western lowlands. Systematic surveys were conducted in western Tigray, and on the Atbara-Gash alluvial plains (Fattovich 1992). The late prehistory of the plateau is almost completely unknown (see Fattovich 1985; Anfray 1990). Most investigations have been devoted to outlining the cultural sequence rather than explaining the socioeconomic development in the region (see Brandt and Fattovich 1990).

2. Historical evidence

Historical evidence includes Pre-Aksumite and Aksumite inscriptions, traditional Ethiopian sources, and foreign sources (see Conti Rossini 1928; Drewes 1962; Hable Sellassie 1972; Tamrat 1972).

So far, over 260 inscriptions in South Arabian, Ge'ez, and Greek, dating to the 1st millennium B.C. to 1st millennium A.D., have been recorded (Bernard, Drewes, and Schneider 1991). They provide information about early historic times, but are silent about the subsistence economy (see Drewes 1962; Kobischanov 1979; Munro-Hay 1990).

Ethiopian sources include hagiographies and royal chronicles, dating back to the 14th-15th centuries A.D. (see Hable Sellassie 1972; Tamrat 1972), and oral traditions (e.g., Salt 1814; Perini 1905; Conti Rossini 1910, 1912, 1913b, 1942; Giyorgis 1987; Gabra Maryam 1987). They provide a schematic picture of social organization and peopling in medieval times, along with a record of catastrophic events (e.g., Conti Rossini 1913a, 1928; Pankhurst 1985, 1990).

Pharaonic, Meroitic, Graeco-Roman, Byzantine, Coptic, and Arab texts provide further data about the history of the Tigrean Plateau and adjacent lowlands (see Conti Rossini 1925, 1928; Hable Sellassie 1972; Vantini 1975; Desanges 1978). They are relevant to outlining the peopling of the western lowlands and northernmost plateau (Rore) (Fattovich 1987, 1990). These texts, however, must be critically evaluated. Hagiographies and royal chronicles are affected by ideological elements which can distort the historical information (see Kaplan 1984; Marrassini 1993).

Oral traditions about migrations and genealogies are more reliable, despite possible ideological distortions (see Conti Rossini 1942). Foreign references are biased in what they report, providing only a partial account of the real situation.

3. Linguistic evidence

Linguistic classification also provides insight into the possible ethnogenesis of the different populations of the region (e.g., Ullendorff 1955; Hetzron 1972; Garbini 1984; Bender 1976). Yet, for lack of a firm chronological framework, linguistic reconstructions are uncertain.

A South Arabian origin of the Semitic-speaking peoples in northern Ethiopia is assumed because of the undisputable relationship between Ge'ez and South Arabian (e.g., Hetzron 1972). This is usually explained by a progressive South Arabian colonization of the Tigrean Plateau beginning in late prehistoric times (Conti Rossini 1928; Ullendorff 1973). A few scholars, however, believe that Semitic-speaking peoples already inhabited the plateau in late prehistoric times (Drewes 1962; Schneider 1976; see also Marrassini 1985). Linguistic evidence suggests that the Kunama occupied the western Ethio-Sudanese lowlands since very ancient times (see Grottanelli and Massari 1943; Bender 1976: 439-483). Finally, a very ancient and indigenous origin of food production on the plateau has been suggested based on linguistic evidence (Ehret 1979).

At present, the picture emerging from archaeological, historical, and linguistic data is fragmentary. However, we can outline the dynamics of peopling in the region based on this evidence, and generate hypotheses to test with future research in the field.

Synthesis

Food production appeared in the region in the middle Holocene (ca. 4000-2000 B.C.). Domestic cattle and possibly wheat and barley were introduced onto the plateau from the western lowlands between ca. 3500 and 1500 B.C. (see Clark 1988; Fattovich 1988; Phillipson 1993). Perhaps ensete was cultivated on the plateau before the introduction of other cereals (Smeds 1955, n.d.).

The earliest evidence of a food-producing culture has been traced along the middle Atbara Valley in the lowlands ("Butana Group", ca. 3800-2700 B.C.). Their economy relied on hunting and fishing with possible cultivation of cereals, and, since the late 4th millennium B.C., livestock breeding. They practiced some long-distance trade and were apparently organized in a rank society (Fattovich, Marks, and Ali 1984; Marks, Ali, and Fattovich 1986; Marks and Sadr 1988; Sadr 1991).

Beginning in the mid-3rd millennium B.C., herders spread over most of the western lowlands as far as the Red Sea coast and southern Red Sea hills ("Gash Group," ca. 2700-1500/1400 B.C.). They practiced barley cultivation, along with hunting and fishing, and were included in an interchange circuit from Egypt to the Horn of Africa and southern Arabia. The archaeological evidence suggests hierarchical social organization (Fattovich, Sadr, and Vitagliano 1988-89; Fattovich 1991a, 1991b, 1993b; Sadr 1991).

In the mid-2nd millennium B.C., people culturally related to the "Pan Grave Culture" of the Eastern Desert mixed with the local Gash Group and occupied the lowlands from the Atbara to the Barka Valley ("Jebel Mokram Group", ca. 1400-800 B.C.). They were an agro-pastoral population, cultivating sorghum and breeding cattle, with marginal contacts with the Middle Nile Valley. The social organization was probably that of small chiefdoms (Fattovich 1991a; Fattovich, Sadr and Vitagliano 1988-89; Sadr 1991).

Rock art suggests that pastoral groups occupied the eastern Tigrean Plateau (Eritrea) in the 2nd millennium B.C. (see Graziosi 1964a, 1964b; Joussaume 1981). Herders of longhorn cattle with an Afro-Arabian cultural tradition, coming from eastern Ethiopia, were moving onto the plateau as far as Rore ("Ethiopian-Arabian Style") (see Cevicek 1971, 1978-79). Herders of longhorn and shorthorn cattle, with a possible Saharan origin, were moving in the upper Mareb Valley and in Akkele Guzay ("Naturalistic Style," "Iberic Style") (see Graziosi 1964a, 1964b; Clark 1976a, 1976b).

A sedentary culture was located on the Hamasien Plateau (Eritrea) in the second half of the 2nd millennium B.C. ("Ona Group A", with red ware) (Tringali 1978-79, 1981; Munro-Hay and Tringali 1993). The occurrence of large residential settlements points to plant cultivation. Carved stone heads of bulls(?), possibly related to an Arabian tradition, might suggest a ceremonial role for cattle. This population was in contact with peoples of the Late Gash Group and Jebel Mokram Group. Egyptian evidence suggests contacts with Egypt, as well. We cannot exclude a complex social organization for the Ona Group A (Fattovich 1993c).

At Karora, rock drawings of longhorn cattle in Ethiopian-Arabian and naturalistic styles confirm that herders coming from the plateau and the lowlands occupied the northern coastal plains in the 2nd-early 1st mil-

lennia B.C. (Graziosi 1964a). At the same time a sedentary population was located near the Gulf of Zula (Paribeni 1907). They were part of a coastal cultural complex ("Tihama Cultural Complex", ca. 1500-1200 B.C.), which included the Arabian coast from the southern Saudi Tihama to Aden (Zarins 1990; Fattovich 1993c). The occurrence of ceramics similar to that of the Tihama culture in the lowest levels at Matara in Akkele Guzai might suggest that this population also occupied the plateau (see Anfray 1966).

Scarce archaeological evidence also suggests that hunter-gatherers occupied western Tigray up to the 2nd millennium B.C. Pottery, pointing to a more sedentary subsistence, appeared in the 4th-2nd millennia B.C., but no evidence of food production is associated with it. Cattle breeding was practiced in the early 1st millennium B.C. At this time, peoples in western Tigray were in contact with peoples in South Arabia and the late Jebel Mokram Group of the lowlands (Phillipson 1977, 1990; Fattovich 1985, 1988, 1990b, 1991a).

A state with material evidence that is remarkably Sabean arose on the plateau in the 1st millennium B.C. ("Kingdom of Daamat", ca. 800/700-400/300 B.C.), as a consequence of intense contacts with South Arabia. The territory of this state stretched from Akkele Guzay (Eritrea) to Scirè (Tigray). Certainly peoples from South Arabia settled on the plateau at this time. The kingdom had direct and/or indirect contacts with the Nubian kingdom of Kush (Napatan state), the Achemenian empire, the Greek world, and northern Syria (Drewes 1962; Hetzron 1972; de Contenson 1981; Ricci 1984; Anfray 1990; Fattovich 1990b).

Cultivation of cereals was certainly practiced to sustain a dense population. This is supported by the discovery of a bronze sickle in a tomb at Yeha (see Anfray 1963). Perhaps soft wheats were introduced from South Arabia at this time (Simoons 1965). Most likely, agriculture relied on artificial irrigation, as we can infer from a dam, comparable to Sabean structures, at Safra in Cohaito (central Eritrea) (see Littmann, Krenker, and von Lupke 1913, II). The use of the plow is very probable, though no firmly datable evidence confirms it (see Simoons 1965; Phillipson 1990, 1993).

The kingdom of Daamat declined in the late 1st millennium B.C., and complex societies at a regional scale appeared in central Eritrea and western Tigray. Sedentary peoples, culturally related to those of Akkele Guzay, were also living on the northern plateau. At this time, plow cultivation of cereals was surely practiced in western Tigray (Fattovich 1990b).

Pastoral peoples occupied most of the marginal regions in the 1st millennium B.C. (Fattovich 1987, 1990a).

Nomadic or seminomadic herders, descended from the Jebel Mokram Group, were living in the Atbara-Gash alluvial plains ("Hagiz Group", ca. 800/700 B.C.-A.D. 300/400). They probably practiced some cultivation of cereals, and were in contact with peoples of the plateau. This population might be identified with the Megabares recorded in classical sources (Fattovich 1987, 1990a, 1991a; Fattovich, Sadr, and Vitagliano 1988-89; Sadr 1991).

Rock art suggests that herders were living on the northern plateau and in the upper Mareb valley ("Seminaturalistic" and "Bushman Style," "Schematic Style"). Peoples who created the "Schematic Style" rock art practiced milking (Graziosi 1964a; Cervicek 1976).

Classical sources confirm that herders, who practiced milking and/or hunted elephants, probably lived along the Barka Valley in the late 1st millennium B.C. ("Ethiopes Kynegetes", "Elephantomaches", "Asaches"). Another group, most likely living in northern Eritrea, were known for eating locusts ("Akridophages"), and eating ostrichs ("Stuthophages"). Peoples exploiting sea food were located along the Red Sea coast ("Ichthophages"), and on the islands along the African coast ("Kelonophages") (see Conti Rossini 1925, 1928; Desanges 1978; Fattovich 1987).

A new complex society, not directly related to the kingdom of Daamat, arose in western Tigray at the end of the 1st millennium B.C. This society evolved into a state which expanded to include the whole plateau in the early 1st millennium A.D. ("Kingdom of Aksum", ca. A.D. 0-900). The kingdom controlled the trade from the African hinterland to the Roman and Byzantine empires, and to the Indian Ocean. The use of coinage was a distinctive feature of this kingdom. A crucial event in the history of Aksum was the introduction of Christianity as the official religion in the 4th century A.D. The kingdom declined in the 7th/8th centuries and disappeared in the 10th century. (Conti Rossini 1928; Fattovich 1988; Kobischanov 1979; Anfray 1990; Munro-Hay 1991; Bard and Fattovich 1993; Fattovich and Bard 1993).

The subsistence economy relied on the plow cultivation of cereals. Emmer wheat was probably an important crop (Phillipson 1993). Humped cattle were introduced onto the plateau in the early 1st millennium B. C. (Clark 1976a; Marshall 1989). Ceramic dishes similar to modern injera trays from late Aksumite assemblages point to extensive cultivation of teff since the late 1st millennium A.D. (Phillipson 1993).

Different pastoral and sedentary peoples occupied the western lowlands in the 1st millennium A.D. They were most likely under the control of the kingdom of Aksum (Fattovich 1987, 1990a). Nomadic tribes ("Beja") had been moving in the Barka lowlands since the early 1st millennium B.C. (Conti Rossini 1928; Zaborski 1967). Pastoralists in contact with the Aksumite kingdom were also located along the northern Eritrean coast (Fattovich 1987, 1990a). In the mid-1st millennium A.D., a sedentary people coming from central Sudan settled in the area of Kassala ("Khatmiya Group", ca. A.D. 300/400-700) (Fattovich 1990a, 1991a).

Most likely, the Christian kingdom progressively shifted southward to Wollo beginning in the 7th century A.D. In the 9th century the capital was no longer located at Aksum. Islamic communities began settling along the coast in the 8th century, and a sultanate arose on the Dahlac islands in the 9th century. At the same time, Islamized tribes penetrated into the western lowlands (Conti Rossini 1928; Tamrat 1972; Fattovich 1987).

Islamic sources record several populations living in the western lowlands and on the eastern plateau in the late 1st millennium A.D. Farmers breeding cattle and small livestock ("Kunama", "Nera") inhabited the Gash and eastern Barka plains from the Eritrean highlands to the Atbara Valley. Seminomadic cattle and camel herders ("Taflin") were probably located in the middle Gash Valley. Seminomadic and/or agro-pastoral Beja and Tigrè tribes ("Zanafij", "Kabdam", "Kasa") with a hierarchical society occupied the Barka Valley and most of the eastern plateau. Beja tribes were also moving along the plains to the north and east of the Barka Valley (see Vantini 1975; Fattovich 1987).

Western Tigray and part of central Eritrea were provinces of the Zagwe kingdom, with a capital at Adafa in Lasta (Wollo), in the 12th-13th centuries. Finally, the Tigrean Plateau was included into the Solomonic kingdom in the 14th-16th centuries. In the early 2nd millennium, herders and farmers migrated from the plateau to the lowlands ("Algheden", "Sabderat", "Halenga"). At the same time, southern Cushitic-speaking peoples ("Bilen", "Zaguà") probably settled on the plateau, in Tigray and Eritrea (Conti Rossini 1912, 1928; Pollera 1935; Fattovich 1987).

Dynamics of peopling

The dynamics of the peopling of the Tigrean Plateau and adjacent lowlands from ca. 4000 B.C. to 1500 A.D. were apparently marked by a

«dialectic» interaction between sedentary farmers (agro-pastoral people) and pastoral people. Migrations occurred at different times, as well. The available evidence points to a continuity in the peopling of the western lowlands and western plateau since the early Holocene, while the eastern plateau was more open to the movement of people (see Fattovich 1988, 1990a).

Any explanation of this process is premature and speculative because of the gaps in the evidence. In my opinion, however, we can comment on some of the cultural and environmental factors which affected the peopling of the Tigrean Plateau and adjacent lowlands.

Cultural factors include:

a) Expansion of a trade network from the Mediterranean Sea to the Indian Ocean (see Fattovich 1988, 1990c, 1993c).

In the 4th millennium B.C., peoples of the middle Atbara Valley were probably in contact with the Nile Valley and the Red Sea Hills (Butana Group). In the mid-3rd to mid-2nd millennia B.C., the Gash Delta (Kassala) was a node in a trade circuit stretching from Egypt and Nubia to South Arabia and the Horn of Africa (Gash Group). In the mid-2nd millennium B.C., the lowlands were isolated, and the Hamasien Plateau was included in a trade circuit with Egypt (Ona Group A). At the same time, a regional trade circuit developed along the Eritrean and South Arabian coast (Tihama Cultural Complex). In the early 1st millennium B.C., the Tigrean Plateau was included in an intense trade network with South Arabia. In the late 1st millennium B.C. to mid-1st millennium A.D., the Tigrean Plateau was again directly included in the interchange circuit between the Roman and later Byzantine empires and the Indian Ocean. In the late 1st millennium A. D., the region became more and more isolated from the main trade circuit because of the Islamic expansion in Northeast Africa and along the Red Sea.

b) State formation (see Fattovich 1993a; Munro-Hay 1993).

Most likely, a rank society arose in the middle Atbara Valley at the end of the 4th millennium B.C. (Butana Group). A chiefdom appeared in the Gash Delta in the late 3rd to mid-2nd millennia B.C. (Gash Group). A small-scale chiefdom arose in the Gash Delta in the late 2nd millennium B.C. (Jebel Mokram Group). Perhaps complex society arose on the Hamasien Plateau at the same time (Ona Group A). A South Arabian-like state emerged on the Tigrean Plateau in the mid-1st millennium B.C. (Kingdom of Daamat). Hierarchical societies at a regional scale appeared on the Tigrean Plateau in the late 1st millennium B.C. A new state arose on the plateau in the early 1st millennium A.D. (Kingdom of Aksum).

After the decline of Aksum, tribal chiefdoms possibly emerged again on the eastern plateau in the late 1st-early 2nd millennia A.D.

c) Change in subsistence systems (see Fattovich 1993a; Phillipson 1993).

The "pastoral complex" appeared in the region in the 4th-3rd millennia B.C., and was firmly established in the lowlands and the northernmost plateau since the 2nd-1st millennia B.C. The cultivation of cereals probably began in the 4th millennium B.C. It was practiced in the lowlands in the late 3rd- early 2nd millennia B.C., and probably on the plateau in the 2nd millennium B.C. The cultivation of sorghum, distinctive of the "hoe and cereal complex", began in the western lowlands in the mid-2nd millennium B.C. The "plow and cereal complex" most likely emerged on the plateau in the 1st millennium B.C.

d) Migrations (see Fattovich 1988, 1990a).

In the 2nd millennium B.C., pastoral peoples moved from eastern Ethiopia to Eritrea, and occupied most of the eastern Tigrean Plateau. Beginning in the mid-2nd millennium B.C., peoples from the Eastern Desert entered the western lowlands and mixed with the local population. At the same time, pastoral peoples of a possible Saharan origin moved along the western slopes of the plateau. Most likely in the early 1st millennium B.C., a group of people speaking a South Semitic language settled on the plateau and imposed their language on the local population (see Hetzron 1972). In the early 1st millennium A.D., peoples from central Sudan penetrated the western lowlands and settled in the region of Kassala. At the same time, pastoral peoples were moving from the lowlands to the eastern plateau. In the late 1st-early 2nd millennia A.D., pastoral peoples from the Eastern Desert and western lowlands again moved onto the eastern plateau, and farmers or agro-pastoral peoples migrated from the plateau to the lowlands.

Environmental factors possibly include:

a) Occurrences of natural resources (see Fattovich 1993a).

The Tigrean Plateau and adjacent lowlands were rich in natural resources: obsidian on the coastal plains; gold in the western lowlands and northern plateau, and marginally on the coastal plains; gums and resins in the western lowlands and eastern slopes; ivory in the western lowlands and northern plateau; ostrich feathers and turtle shells on the coastal plains and islands; and prized animal skins from the entire region.

b) Climatic fluctuations (Gasse, Rognon, and Street 1980; Butzer 1981; Hassan 1981).

Present-day climate and rainfall have been established in the region since the 2nd millennium B.C. The climate was probably quite arid from the late 3rd to mid-/late 2nd millennia B.C. A minor humid period occurred in the mid-1st millennium B.C. to mid-1st millennium A.D. Historical records of Nile floods suggest a drier period in the early and late 2nd millennium B.C., and very unpredictable rainfall since the mid-1st millennium A.D. Rainfall apparently declined in the second half of the 1st millennium A.D., except for an episodic increase in the 7th-8th centuries. Rainfall increased in the 10th-11th centuries, and declined again in the 13th-14th centuries.

c) Catastrophic events (Gouin 1979; Pankhurst 1985; Relief and Rehabiliation Commission 1988).

Catastrophic events certainly occurred in the past. The earliest records of a famine, usually associated with epidemics, go back to the mid-9th and mid-12th centuries. Several famines have been recorded since the 13th century. Droughts are recorded in the 16th and 18th centuries. An impressive locust invasion occurred in the 16th century. There were at least four earthquakes in Tigray in the 15th-16th centuries.

Tentatively, the process of peopling of the Tigrean Plateau can be outlined as follows (Fattovich 1988, 1990a, 1993a, 1993b):

1. The occurrence of prized resources, mainly in the western lowlands and eastern plateau, caused the progressive inclusion of the region into an interchange circuit from Egypt to the Horn of Africa beginning in the 4th millennium B.C.

2. The inclusion in this network was conducive to state formation on the Tigrean Plateau. Initially, complex societies arose in the western lowlands because of their strategic location as a gateway to the Horn of Africa and southern Arabia. Then, with the improvement of maritime trade in the mid-2nd millennium B.C., the lowlands were isolated, which stimulated the rise of complex societies on the eastern plateau. The inclusion of the region in the South Arabian interchange circuit in the early 1st millennium B.C. resulted in the (limited) movement of people from South Arabia to the plateau, where an early state arose. Finally, with the development of Graeco-Roman maritime trade in the late 1st millennium B.C. and early 1st millennium A.D., a new kingdom arose on the plateau.

3. The process of state formation affected the diffusion of food production in the region. Livestock were probably introduced into the middle Atbara Valley at the end of the 4th millennium B.C. The rise of a hierarchical society in the Gash Delta in the mid-3rd to mid-2nd millennia B.C. probably improved local cultivation of cereals. The formation of states on the plateau in the 1st millennium B.C. and 1st millennium A.D.

was conducive for the adoption of plow cultivation of cereals and artificial irrigation to sustain dense populations.

4. In the 3rd millennium B.C., pastoralism became the dominant adaptive strategy in the western lowlands, probably to cope with a drier climate. At the same time, livestock were apparently introduced into the Horn of Africa. Increasing aridity in the 2nd millennium B.C. caused a movement of pastoral peoples to the western lowlands and the plateau, and from southeastern Ethiopia to the eastern plateau. This aridity probably stimulated the introduction of sorghum cultivation in the lowlands, as well. In turn, the humid period of the mid-1st millennium B.C. to mid-1st millennium A.D. stimulated the improvement of sedentary agriculture and state expansion on the plateau.

5. State expansion, most likely associated with demographic growth, progressively pushed pastoral peoples toward marginal areas. The state was also a barrier to movements of people from the lowlands to the plateau. In turn, this expansion most likely caused soil exhaustion and environmental deterioration on the plateau.

6. The combined action of environmental deterioration, with possible droughts and famines, and the progressive isolation from the main interchange circuit, most likely caused the decline of the state in the late 1st millennium A.D. In turn, the decline of the state was a factor in a new movement of pastoral peoples from the lowlands to the eastern plateau, while environmental deterioration might have caused migrations from the plateau to the lowlands in the late 1st and early 2nd millennia A. D.

CONCLUSION

The picture of the dynamics of the peopling of the Tigrean Plateau that I have suggested is largely hypothetical. The reconstruction of this process requires a multidisciplinary research approach at a regional scale with an ecological perspective. This approach should involve:

1. Geological investigations to map the distribution of minerals and geodynamic environmental hazards, and provide evidence of major climatic fluctuations;

2. Geomorphological investigations to outline landscape change, minor climatic fluctuations, and the effects of human activity on the landscape;

3. Paleoethnobotanical and faunal investigations to reconstruct changes in the wild flora and fauna, and effects of human activity on them;

4. Bio-archaeological investigations for evidence of change in subsistence systems;

5. Archaeological and historical investigations to outline socioeconomic history and evidence of migrations;

6. Linguistic investigations to outline the ethnogenesis of different populations.

I believe that in such a way it will be possible to suggest a general model of man-environment interactions through time, and an explanation of the dynamics of peopling in the region. Moreover, this model could be useful in the future to plan better economic development of the country.

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