

ON THE ROLE OF GEOLOGY IN TRIBAL LIFE PATTERNS

BY

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Perhaps a unique example demonstrating the role of Geology in the formation of tribal life patterns is to be found in the Horn of Africa, and notably Ethiopia which is often described, because of its high relief, as the African Tibet.

It is this relief and the changes of relief, which reflect the main geological events that have occurred in the area, which can help us subdivide the area into distinct physiographic units, with patterns of life adapted to the conditions prevailing in each distinct unit.

The general relief of the Horn of Africa can be geomorphologically understood as relief features of the second order, caused and formed by the operation of exogenetic and endogenetic processes and causes.

In the Ethiopian region, second order relief features are particularly noticeable, the Ethiopian Plateau, the Harrar Plateau and the Ethiopian part of the Great Rift Valley. These are distinct second order relief features. Another distinct physiographical unit is the peripheral lowlands, geologically consisting of the precambrian basement, petrographically complex but mainly consisting of granites, gneisses, metamorphics and ultrabasics.

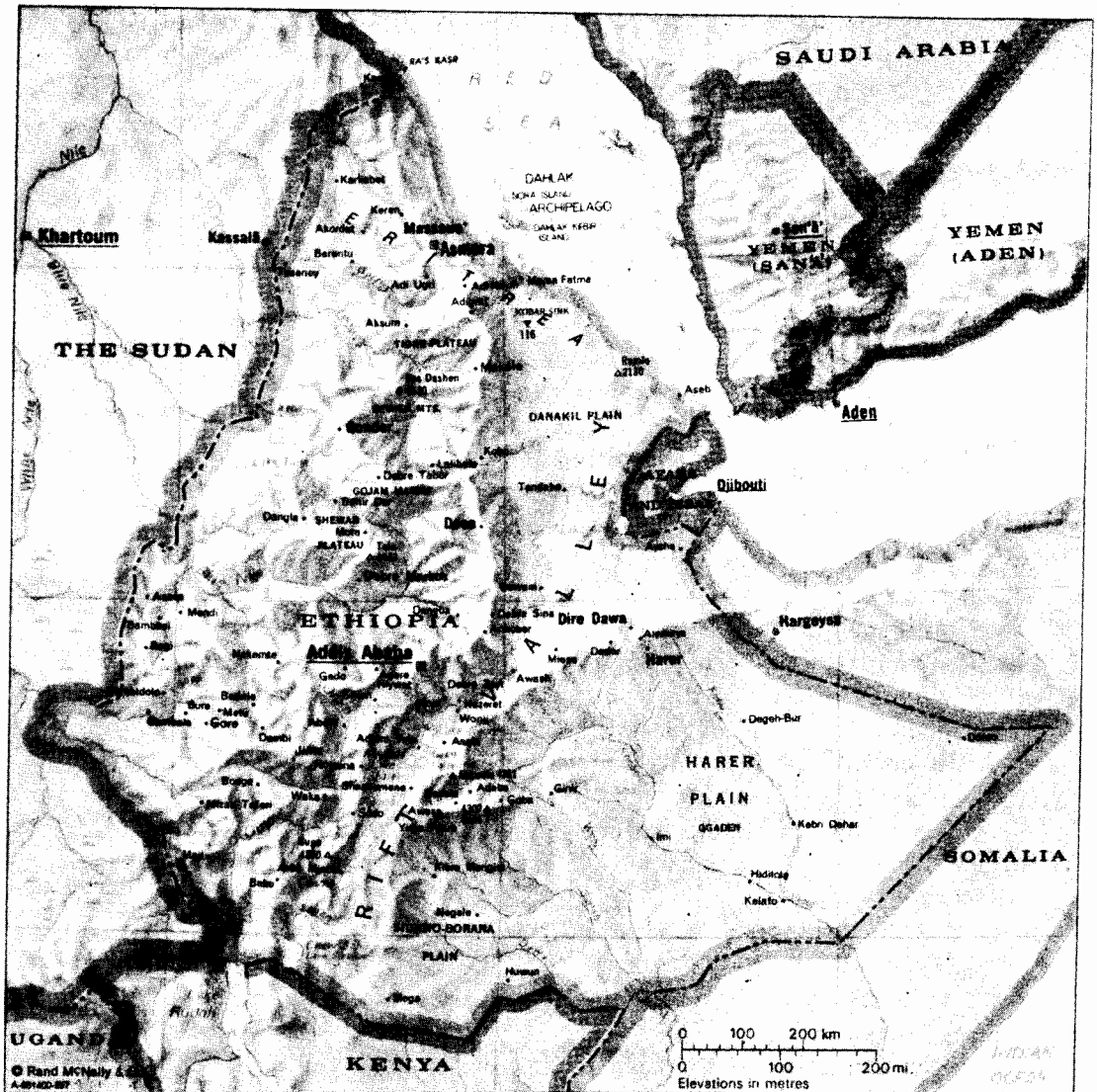
Superimposed on the features of relief of the second order are third order relief features formed by exogenetic processes, i. e. drainage patterns.

On the Ethiopian Plateau and transversing the peripheral lowlands is the Blue Nile drainage pattern, which, due to its magnitude, can be seen as a distinct physiographic unit, partly connected with the peripheral lowlands.

The formation of the east African basement is the result of a series of precambrian orogenetic cycles and the subsequent denudation and

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Presented as farewell greetings, on the occasion of the termination of his terms of Presidency of the Greek Geological Society.



paneplanation of the area during the palaeozoic period. On the precambrian plane we have the formation of triassic aeolian sandstones (Addigrat series) followed by marine sediments, mainly limestones, marls and clays, indicating a jurassic sea transgression. Sedimentation continued also during the cretaceous period. The area was uplifted and arched forming a gigantic dome. Partly simultaneous with and subsequent to the uplifting, tectonic movements and volcanism occurred. During the tertiary times an out-pouring of huge basaltic flows occurred, forming the plateaux basaltic series (trap series) which were piled over the sedimentary formations. Concurrent with volcanism, tentional earth forces operated and the taphroidal structure of the Great Rift was formed. Part of this today forms the Ethiopian system of the Rift Valley.

On the Ethiopian Plateau we have the establishment of the rejuvenated Blue Nile drainage pattern, which has cut prominent gorges, geomorphologically comparable to the Grand Canyon of Colorado. By contrast, on the Harrar-Sidamo Plateau we have a drainage pattern consisting of two consequent rivers, the Genale and the Shebele, which start from the elevated plateau and reach the Indian Ocean.

Another interesting drainage pattern is that of the River Awash which starting from the Ethiopian Plateau, follows the Great Rift Valley but fails to reach the Red Sea, terminating in the local basin of Lake Abbe.

The precambrian peripheral lowlands, particularly in the western region, are drained by the River Dabus, a tributary of the Blue Nile, and in the south west by the River Baro, a branch of the White Nile.

With this geological-geomorphological background, separate physiographical units become more recognisable. Needless to say, the topoclimatological conditions also depend on relief features and in turn influence the physiography of the units.

There is, therefore, an obvious interrelation between the geology-geomorphology and physiographic subdivisions of the Horn of Africa.

With the sharp differences of relief to be found between the peripheral lowlands and the top of the plateau, it is not surprising that contrasted physiographical differences and differences in the flora and fauna should also exist. The separate environments that can result within these physiographic units can be distinguished thus, as far as the distribution and behaviourism of Homo-Sapiens is concerned it is not surprising to find distinct and contrasted patterns of life within the same tribe depending on whether a group lives on the plateau or in the Rift.

There is, however, a closer coincidence between tribal clans and physiographic units. The clans have evolved as tribal subdivisions that

have adapted themselves to live in a specific environment such as a physiographic unit.

An example is provided by the Galla, Cushotic-speaking tribe broken into distinct clans, the Boronas, Gugis, Aroussis, Dankalis¹ and the Plateaux and Wollaga Gallas.

Each of these distinct Galla clans is living in or sharing a physiological distinguished unit by a specific environment.

The Boronas live mainly in the precambrian peripheral region, adjacent to Kenya. Their life style is adapted to the peripheral lowland physiographic unit, consisting of precambrian rock types.

They are the original stock of Gallas which are found in north Kenya and south Ethiopia. The Borona region is a precambrian lowland, and apart from the Melca-Cuba, a tributary of the Ganale, without pronounced river systems. Borona and the more norther Burgi region, are relatively dry basement-lowlands, but with sufficient rainfall to maintain pastoral life. In Burgi and in parts of Borona the lack of water imposes an extremely different life pattern from that of the Nilotic tribes living in the western lowlands of Ethiopia.

A great part of the pastoral Boronas are cattle — and camel — breeding nomads. Living in easily-portable straw and cow-skin tents, they are always ready to move. The Burgi region is notable for the big holes dug to collect water for the summer. In many cases settlements have grown up around these water reservoirs. One feels the vastness of the Borona lowlands, which for the greater part consists of granitic-gneissic rock types covered by a thick weathered coating. As is to be expected, the nomadic Boronas are also hunters and fierce fighters.

Another Galla clan, the Gugis, pursue a life style in sharp contrast to the Boronas and Burgis. They live mainly to the north of Borona-Sidamo in the thickly forested highlands of the basement, in the Adolla region.

The Gugis are settled cattle-breeding, hut-dwellers, with organised markets centres. They are believed to be a differentiated Borona clan. In certain parts of Sidamo-Borona the Gugis are so well attended to forest life that some claim to be able to «understand the language of the birds». Be that as it may the Gugis are undoubtedly familiar with animal behaviourism.

The Dankalis, Aroussis and Somalis also originate from the Borona Gallas. Within the recently volcanic Ethiopian part of the Great Rift Valley, Dankalis live as a nomadic, goat — and cattle — breeding clan, perfectly adapted to the areas vast, moon-like landscape. The fierce

1. Dankalis or Danakilis.

Danakilis with such related clans as the Issas, are often at war among themselves, reflecting perhaps, the harshness of their surroundings. They live in straw huts, and do not hesitate to move along the Rift but never too far from the Awash Valley.

However, on the Red Sea coast, Danakilis live by sea fishing, and have an entirely different pattern of life. We thus see a part of the Dankali clan adapted to a different pattern of life dependant on the environment, which in turn reflects the tectonics of the taphroidal Rift structure, a part of which is invaded by the Red Sea.

Related to the Dankalis are the Aroussis, again a nomadic, cattle — and goat-breeding clan. They are found in the central part of the Ethiopian Rift Valley.

The Great Rift Valley forms a distinct tectonic structure and also a distinct physiographic unit having a restricted rainfall and a semi-desert erosion cycle. It is not, therefore, surprising that the Danakilis, Aroussis, Issas and Somalis found in the Great Rift Valley share similar life patterns.

The Ethiopian Plateau was invaded from the south by Boronas who crossed the Rift and occupied large parts of Showa and Wollaga.

On the plateaux they intermixed with the Semitic Amaharas, who together with the Tigres, had earlier entered the area from Arabia.

The plateaux Gallas have adopted the Amaharas pattern of life and ways of living and it is, therefore, logical to consider the Amaharas and Galla clans living in the plateau together as a single plateaux dwellers group. The plateaux dwellers have a pattern of life adapted to the environmental conditions which prevail on the plateaux (average elevation 2000 - 3000 m.).

Considering that the plateaux are covered by thick basaltic flows which have weathered to produce a lateritic cover which in turn yields a fertile black soil, it is not surprising that the plateaux dwellers have developed agriculture. The abundant rainfall and the fertile soil have encouraged the establishment of an agrarian way of life, with the ox widely used for ploughing. This agrarian life style is the main characteristic of the plateaux dwellers.

When the basaltic flows solidified they yielded a massive rock type (often though with developed columnar structure) as a result, basalt is very little used as building material by the plateaux dwellers. Basalt tends to be a difficult building material due to its hardness and massive nature. In contrast the abundant vegetation (particularly the recently imported eucalyptus) provide the timber for tukuls; mud the other basic construction material is easily provided by the weathered basaltic cover.

The tukul in architectural design and construction shares many basic

elements with other African cultures, but the plateaux dwellers have developed their own construction patterns, which show local variations.

The geological environment has not only influenced the house-pattern of the plateaux dwellers, but even their more advanced architectural achievements. The Lalibela Churches were carved out of Addigrat sandstone terraces along the Lalibela Gorge, which is a part of the rejuvenated Blue Nile drainage system. Comparable monolithic churches are known in the Sinai. Also the Axum obelisks are made of local volcanic rocks found in the region of Axum. Here again we see the importance of geological influences not only in the shaping of tribal life patterns, but also in the development of their culture¹.

The Nilotic Tribes and Their Pattern of Life.

These groups of tribes actually represent the autochthonous African stock. From the Gambella region to Assossa - Ondonock, many Nilotic clans are found, including the Jamboes, the Shankilas, the Shogalis and the Massangos.

Their life style shows variations, but most of them share a pattern adapted to the physiography of the region. The Nile drainage system, namely the Rivers Baro, Dabus, Didessa and the Blue Nile itself, plays a predominant role in the shaping of the life patterns of the Nilotic clans.

Most of their villages are by the river side, they fish and cultivate maize in the fertile river bank soil. Their canoes made from hollowed out tree logs, their straw huts, their exuberent dancing which one can trace the modern dances and music of the American (Negroes) are characteristic signs of their pattern of life.

The Shankila clans by the River Dabus, particularly those living in the region of the Dabus-Bamboo belt, have pipe instruments, whereas the Jamboes by the River Baro have small hand-pianos.

It can be concluded that the Nilotic clans are original African stock adapted to live by the banks of the Nile drainage system. They tend to be romantic, joyful and, if threatened ready to retreat into the jungle. However, some of the Shankila jungle-living clans have become wandering hunters, but they retain their love of dancing which originally they learned around a fire on the river banks.

The Nilotic groups have adapted to live in the peripheral precambrian lowlands where the physiography and the physical environment are influenced by the drainage pattern and the relief that this drainage has carved out of the massive gneissic-granitic African basement.

1. Let us consider what the effect on Greek architecture and sculpture had basalts instead of marble, been the predominant rock formation.

The Horn of Africa is one of the World's high relief regions. The fact that relief units correspond to distinct physiographic units and that distinct patterns of life have developed which are adapted to the environmental conditions prevailing in these units, can be taken as an example to indicate the importance of geology in the shaping of patterns of living.

It should be noted that the picture of the life patterns presented here is of those prevailing a quarter of a century ago before the impact of civilization, which tends to obliterate the old established patterns of life and culture that have been felt.

The described patterns of life were developed by tribes and clans living in the relatively isolated environments prevailing in relatively separated physiographic units.

Intercommunication between tribes or even between clans was limited and their patterns of life and culture was adapted to their environment. The Rift Valley dwellers would hardly move on the plateaux. The boundaries of the Rift, the Fault Escarpments, were an insurmountable physical boundary. Similarly, the Nilotic tribes would hardly move on the plateaux. Only some movements along the drainage system, along the valleys of Didessa and up the Blue Nile Gorge, was possible.

The evolution of distinct patterns of life was a slow process, of adaptation to the environment. It is therefore, not surprising that once distinct patterns had been established, they were preserved and protected as reflecting a group's own way of life. Clan's adaptation to a certain life pattern was also reflected in the development of cultural patterns which were further influenced by the physiographic environment, and the clan's mental potentialities.

The main influence of geology is in the shaping of the physiographic units and the effect which the rocks and soils of an area produce in the shaping of a particular life pattern.

Unfortunately, this «Museum of people» as Rossini called Ethiopia, has been radically altered by the intrusion of Western civilisation traversing what were insurmountable boundaries and has knocked down the protective fences of each specific life pattern, which was the product of centuries of evolutionary development.

B I B L I O G R A P H Y

- AUGUSTITHIS, S. S. 1962.— Researches of Blastic Processes in Granitic Rocks and later Graphical Quartz in Pegmatites (Pegmatoids) from Ethiopia. *Nova Acta Leopoldina, N. F.* No 156, Bd. 25.
- 1963.— Oscillatory zoning of Plagioclase-Phenocrysts of the Olivine-Basalt from Debra-Sina, Ethiopia. *Chemie der Erde (Jena)*, Bd. 23, S. 71-81.

- AUGUSTITHIS, S. S. 1964.— Non-Ex-Solution perthites from Pegmatoids of Yavello/Borona, S. Ethiopia. *Chemie der Erde*, Bd. 23, S. 227 - 247.
- — Article on the Geology of «Ethiopia». *Encyclopedia of the Science of the Earth*. Published by Prof. Fairbridge (Columbia University). In Press.
- 1965.— Mineralogical and Geochemical Studies of the Platiniferous Dunite, Birbirite - Pyroxenite Complex of Yubro/Birbir, Ethiopia. *Chemie der Erde (Jena)*, Bd. 24, Hf. 2, p. 159 - 196.
- 1966.— Micrographic (Granophyric) Textures in Quartzitic Pebbles of the granitised Conglomerate of Buri-Rashicha, Ula-Ulo, Adolla District, S. Ethiopia. *Cont. Mineral. and Petrol. (Beiträge zur Mineralogie und Petrographie, Springer Verlag)*, Bd. 13, 75 - 82.
- 1967.— On the textures and paragenesis of the gold-quartz-tourmaline veins of Ondonoc, W. Ethiopia. *Mineral Deposita (Berl.)*, **3**, 48 - 55.
- Mantle fragments in Basalt. *Bulletin of Geological Society of Greece*, **VIII**, No 2, 1971 - 1972.
- OTTEMANN, J. and AUGUSTITHIS, S. S. 1967.— On the Origin and Geochemistry of Pt-Nuggets in lateritic covers of Ultrabasics and Birbirites. *Mineralium Deposita*, **1**, 269 - 277.
- DORESSE, J.— Histoire sommaire de la Corne Orientale de l'Afrique. (1972; Eng. trans., *History of the Horn of Africa from antiquity to Modern Times, in prep.*).
- ENCYCLOPAEDIA BRITANNICA.— Ethiopia.
- FROBENIUS, LEO 1933.— Kulturgeschichte Afrikas. *Phaidon-Verlag*.