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GENERAL CLIMATOLOGICAL CONSIDERATIONS IN RELATION TO TROPICAL BIOCLIMATOLOGY

J. P. NICOLAS

Dept. de Géographie, Institut Français d'Afrique Noire, Dakar, Senegal, W. Africa

GEOGRAPHERS usually consider climatology as an approach to the knowledge of a natural region; some of them, with the exception of physical geographers who are concerned mainly with human problems, emphasize climatological aspects.

In describing a tropical country we are obliged to consider the equilibrium which arises between atmosphere and living organism. To understand the environment where geographical facts are developing, more is needed than the analysis of the different factors representing this environment. A synthetic view of the problem through an evolutionary process is required. At first sight, changing the climatic influence may be of great importance, but on close inspection cyclical evolution may explain a lot of facts, provided that the environment be clearly defined.

A great deal of confusion exists now in the concept of environmentalism. This is not peculiar to tropical zone studies. The analysis of climate in an ecological study usually includes many factors apart from the living thing under study. The efforts of ecologists are well known but that of biogeographers is not. This method is erroneous because there is no "climate" as such, but only reactions between a physical state of atmosphere and a physiological state of living. In other words, a system of energy balance takes place. The living being has characteristics which differ according to its type of constitution and its physiological functions, one of the most important being thermoregulation. Climatic analysis cannot be conducted in the same way if the object of study is a snail as though it is a monkey. Even in a group of mammals, the method will be different for a sweating man and a panting dog.

Another source of confusion is the different point of view of the workers who study the biological equilibrium in climatic changes. These investigations are of paramount importance in our changing world where speed of travel is increasing and where people suddenly have to work in new environmental conditions. They find a justification in mines, in the microclimates of submarines, in jet-plane pilots' physiology. But this, strictly speaking is not bioclimatology, but the study of working environments. Usually workers in these fields investigate extreme conditions, which constitute a stress. Of more concern to the geographer is the research concerned with people working in petroleum fields, desert, etc.

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The geographical expression of climatic influence either on animals or on man includes the time factor, either a long-term influence covering several generations, or a short-term effect through years and centuries. We have begun to be convinced of this in temperate zones, but not in tropical ones, because all the studies of the effects of heat and cold have been made by white men for whom the climatic conditions approach the stress level in many cases. However, the extreme conditions that we are able to produce in climatic chambers are, in fact, very rare in nature, and if they occur in some places, it is difficult to say if these conditions are really extreme for adapted populations.

Thus, there are two main considerations to guide geographers in their bioclimatological investigations. First, climate is of no significance in itself, but only in combination with a living being, whose physiological functions have to be well known. Secondly, the duration of moderate conditions are more important than those of extreme ones, especially as populations are adapted to those extreme conditions, and because physiological investigations are not yet sufficiently advanced for us to be certain about racial differences.

Geographers must also take into account the sociological and psychological factors affecting the conditions dictated by the atmospheric complex. A typical effect of those factors is the spectacular change in the way in which white people live in the tropics as a result of improved housing and acclimatization.

All the experience acquired in the tropics leads me to express my wish that more observations be made on the environmental complex, and that through a knowledge of the different factors influencing a biological equilibrium, climate be considered with more attention to the living thing under study.