

An Appraisal of the Scientific Nature of Geography

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Abstract

The paper attempts to address the nature and content of geography as a scientific discipline. This is against the background of the misconceptions about the subject especially among non-geographers or pseudo geographers, particularly students of the Natural Sciences who have very little or no contact with academic geography. The paper discusses some contributions of geography to national development, and reviews some attempts at the development of scientific theories in geography. Finally, the paper attempts to place geography most appropriately as a science of the environment.

Introduction

Geography though a late comer in the academic environment, is one of the oldest fields of study, which has attracted the attention of scholars from ancient times. The field like any other man-invented discipline, has had its share of internal and external wranglings. The internal controversies were geared towards a critical reappraisal of its contents, philosophy, methodology and its relationships with other academic disciplines (Jeje, 1989). These changes in the methodology of geography since 1950 have been discussed elaborately by Abler et al (1971), Harvey(1976), Chorley and Haggett(1967). Haggett et al(1977), Bird (1993), Johnston(1986) and Jensen (1980). The external threats involve the subjection of the discipline and its practitioners to scrutiny from outside. It is the response to these external challenges that produced the Pure and Applied angles of geography.

Geography as a discipline has contributed to national development for quite a long time. In Germany, geographical knowledge was used to give direction and support to the policies of the state. Colonial geography, the concept of possibilism and regional approach were vigorously pursued in France. It was the concept of the pivot area of the heartland in the world island that Britain used as her basis of expansion and development. While America's development was guided by the man-nature relationship. Some developing nations example Nigeria went the extra mile to use geographers as agents of mass mobilization for economic and political awareness.

After the Second World War, attention shifted in the methodology of geography towards re-aligning the discipline into the mainstream of modern science. Yet, Jeje(1989) observed that " A lot many people now hold the opinion that geography is not a discipline on its own and

that its protagonist at best are dabblers in fields in which they have little or no expertise". Thus many geographers have often been asked the embarrassing question-what exactly is this your geography about? "This becomes more embarrassing when a practicing geographer - M.E Elliot I-first (1985) asserted that geography has neither existence nor future. It is in the light of this development that an attempt is made in this paper to identify the place of geography among the sciences.

What is Science?

The term science connotes different things to many people. Science is not any general or particular body of knowledge. Science is distinct because of its methodology. The word science is too large and complex a concept to be defined concisely. Conventional definitions of science tend to emphasis quite different features, depending on the point of view (Caldwell, 1992). In this regard Nkeonye (1992) defines science as a "systematic study of nature or a body of knowledge or information". This means that science enables us to build up the background information for the understanding of the basis of life and equips us with the knowledge necessary for the explanation of phenomenon that we come across in our daily life. Braithwaite (1960), cited in Harvey (1976), stated its aim as the establishment of general laws covering the behaviour of the empirical events or objects with which the science in question is concerned, and thereby enabling us to connect together our knowledge of the separately known events and to make

reliable predictions of events as yet unknown. For example, the advancement of our understanding of the way in which the observable world works. The development of logic, integrated and consistent description of how and why certain individual events occur. Such as, why do oranges fall from trees? Why do we experience eclipses etc. The laws of gravity, optics, chemical reactions, knowledge of the physiology of digestion, knowledge of the process of mountain building etc, are all different kinds of science. Therefore, basically the difficulty encountered in attempting to define science emerges primarily from the practice of confusing the content of science with its methodology. The methodological distinguishing characteristics of science are its ability to make and test hypothesis, generate empirical laws, which when accumulated serve as the building block for theories. In fact, Mario Bunge (1965) regards theorizing as synonymous with the scientific method when he concludes that 'no theory building no science'.

What does Geography study?

Geographical studies are as divergent as reflected by its numerous definitions. These divergent views stem from the focus of study; thus Peter Hagget(1969) defined geography as 'the study of the earth surface in the space within which human population lives', Ackerman (1958) stated that the fundamental approach to geography is the differentiation of the content of space on the earth surface and the analysis of space relations within the same universe. According to

Hartshorne (1959), geography is concerned with 'providing accurate, orderly and rational description and interpretation of the variable character of the earth surface'.

From these definitions it will be noted that two themes run through all; these are spatial association and areal differentiation themes, which seek to answer questions as observed by Johnson (1980), 'are there any relationships between phenomena in various locations and whether places are different in terms of the phenomena present there. The major topics addressed by geographers under both themes concern the relationships between man and his environment. Answers to these questions are often provided through the analysis of cause-effect relationship, probabilistic processes etc. Any method adopted usually depends on the values or objectives the investigator hopes to achieve and it is the method adopted in answering the above questions that qualifies geography under any of sciences.

Geography as a Science

In the past geography used to be strictly descriptive and taxonomic and therefore hardly stated and tested any hypothesis. Consequently, it was regarded as a non-scientific discipline no matter how exact it may be. Geography especially during the late 18th to early 19th century provided and even systematized data that was used by such sciences as geology, botany, sociology etc, but itself was considered non-scientific or as a protoscience. Today geography transcends its, past descriptive/taxonomic outlook. It is a basic knowledge

among geographers today that the discipline has shifted its emphasis (paradigm shift) from a basic concern with mere ordering of data, to a major interest in scientific analysis. In fact Boulding (1960) put it more succinctly thus:

"Geography is in a state of intellectual ferment, busy developing and absorbing new methods, especially quantitative methods, on all sides and quite consciously aware of its role as an integrator of many social sciences and natural sciences."

In the past four decade or so, especially with the advent of the quantitative revolution and the use of electronic images (in remote sensing and geographic information system), Geographical studies and research have demonstrated the formulation and testing of hypothesis, which are peculiar to spatial and environmental problems. In trying to understand the complex relationship between spatially variable phenomena, geographers adopt methods, which usually present their knowledge of facts in the form of concepts, relationships (laws), and principles that can be applied to all parts of the world. For example, it is known from Newton's law of gravitation that the earth's gravity acts vertically upon anybody moving on the surface of the earth. However, it is also an established fact that such a body is also liable to the influence of the earth's geostrophic force which gives the moving body a relative acceleration to the right or left depending on the hemisphere (Ferrel's law). Based on these and other laws like the universal gas

law and Hadley's principles, the Tricellular theory of atmospheric circulation was developed. Other theories developed to explain geographical phenomena include Walter Christaller's (1939), central place theory, Zipf's (1949) Rank size theory, T. Hagerstrand's (1965) Spatial diffusion theory, Christian Werner's (1969) Topological randomness theory among others. The result in any case is to produce a body of knowledge in a logical manner. This means the use of Theories, Models, and Hypotheses etc, all of which are different but mutually interrelated scientific ways of looking at the same phenomena. In general therefore, if the claim of any scientific enquiry is to provide systematic and responsibly supported explanations (Harvey, 1976), then the overall aim and methodology of geography is in consonance with the general principles of scientific enquiry.

What Science is Geography?

The position of geography as a science however, needs further qualification. Some of the most important concepts that are basic in geography are those of the 'environment' and 'society.' The two concepts are equally significant since the central issue in geography generally concerns man- in-the-environment and man-in-society. In particular geography has a good understanding of the significance of factors of location, the complexity of the man-environment interaction, the problems of environmental quality and a good experience in dealing with environmental systems and processes. Geographers however; realize that the problem of the environment must be looked

at not only in physical, chemical and biological terms, but very importantly too, in relation to human perceptions, needs, desires and location.

These general characteristics give geography a comparative advantage in environmental studies over other subjects. If we accept the view that, environmental science is concerned with the environment, or our surrounding, aid how the forces of nature and the hand of man have changed and are continuing to change the face of the earth (Encyclopaedia Britannica), then the comparative advantage of geography, as the leading environmental science discipline is adequately justified.

Some may argue that environmental issues or studies are not the exclusive preserve of geography. This is true since by nature the environment is a complexity the understanding of which must be a multidisciplinary affair. However, the fact still remains that the problem of the environment are usually best addressed where the expertise of the natural sciences, social sciences and environmental and location studies design are integrated. The geographic heuristic of environmental studies is the effort to effectively integrate knowledge from various fields and bring these to bear successfully on the solutions to the problems of the environment.

Conclusion

Geography, by its nature is an integrative and synthesizing science. It is a spatial science that deals with both the physical and human environment. It is not surprising

therefore, to note that geography is probably the only academic discipline that is located in more than one faculty of our Universities. It is neither an academic monolith, nor a jack-of-all trades, as some non-geographers would like to think.

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