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GEOGRAPHY AND TEACHING OF THE ENVIRONMENT : A REVIEW AND SUGGESTIONS

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ABSTRACT : The paper is divided into three parts. Part I is devoted to a review of the changing perspectives on the status of geography as an environmental science from early times to the present. In this part, the reasons for successive changes in geography's disciplinary focus on the environment have been briefly highlighted. Part II is devoted to a discussion on "Geography and the challenge of environmental education." One of the major tasks of environmental education is promotion of informed attitudes of concern for environmental quality and the process and nature of environmental deterioration. This is a most crucial task, since air and water become progressively worse at a rate which is so slow that people gradually "adapt" to it psychologically without being aware of the impending danger point. Detailed suggestions are offered regarding how environmental education can be integrated in geography curricula from the elementary school to the college level. Suggestions regarding teacher training programmes are also made. Part III begins with a short discussion on the vitally different nature of the presentday environmental concern from those found in the works of the earlier geographers – from Ratzel and Vidal de la Blache to Barrows. Attention is also drawn to the fact that although most of our present-day problems of environmental degradation may be traced to industrialization, urbanized economies, and "development", it is clearly too simplistic to cast advanced technology in the role of sole or even major villain. Technology cannot be viewed as an autonomous cause separate from economic growth which powers it and in turn is powered by it. Distinction is drawn between pollution of affluence and pollution of poverty, each of which requires different sets of resolution strategy – since like poverty, the problem of pollution is essentially a human and socio-economic problem which, in detail, is context specific.

From its earliest beginnings geography has been conceptualized as some kind of an "environmental science" – a discipline engaged in locating, exploring, describing, and analyzing the "environs" and contents of places occupied by different communities on the earth surface. Some scholars, in the tradition of Von Humboldt, pre-eminently concerned themselves with systematic analysis of the processes involved in the general worldwide patterns of the earth's environment in terms of such important elements as climate, landforms, vegetation cover and soils – i.e., elements that appeared to determine the degree of habitability of areas on the globe. There were others, in the tradition of Karl Ritter, who devoted their energies to detailed description and analysis of particular parts of the earth surface as divided into continents, countries, and places. This was a tradition that was pursued to great heights in France under the leadership of Vidal de la Blache who described geography as "the science of places." The systematic tradition of Von Humboldt (that seemed to parallel the efforts of workers in other physical and biological sciences also engaged in the study of the physical environment) suffered eclipse soon after the rise of separate systematic disciplines, each devoted to the study of a particular group of elements of the overall environment – plants, animals, soils, weather, waters and rocks. Studies in the regional tradition, concentrating on analysis of places and areas in terms of their overall structure were, however, continued, both in terms of the regional perspective of Ritter-and-Blache as well as the short-lived landschaften perspective that treated geography as a systematic science of areas.

In the middle of the 19th century, geography was faced with a great crisis of identity regarding its status between the natural sciences and humanities, as a series of new systematic sciences appropriated aspects of the physical environment that previously lay under the domain of geography. The one time mother of sciences now stood impoverished and dethroned. As a way out of the crisis two alternatives and competing paradigms of geography were advanced. One was the Social Darwinist concept that projected geography as the study of man's relationship to the environment – the so-called manland tradition that was pioneered in Ratzel's *Anthropogeographic.* The other was initiated in Richthofen's famous inaugural address of 1883 at Leipzig – a lead that was mot effectively marshalled by Alfred Hattener in the opening decades of the twentieth century. This concept treated geography as the study of the earth surface in terms of areal differentiation, and was essentially chorological and non-environmentalistic in perspective.

For a long time Ratzel's social Darwinist concept of geography as the study of man's relationship to his environment had held away – whether it was with an emphasis on the role of human choice (as in the possibilist tradition of French geography) or on influences and controls exerted by nature on the course of development of human societies (as visible, for example, in the works of Ellen Churchil Semple in U. S. A. and A. J. Herbertson in U. K.). With a view to steering clear through the misplaced controversy between possibilism and determinism, Harlan Barrows (1923) had presented an alternative approach of "geography as human ecology", in which he advocated the study of human societies in relation to their environment, and laid emphasis on environmental adaptation rather than environmental control. But in each of its three variations, the man-environment relationships approach – possibilistic or deterministic – retained faith in the philosophy of causality and invariably involved some kind of cause-and-effect analysis that demanded from the student more than superficial interest in the dynamics of the environment. Thus throughout this epoch geography retained its status as an environmental science.

In the opening decades of the twentieth century, as the positive philosophy of science caught the imagination of geographers, causality, causal mechanism, and cause-and-effect analysis became discredited concepts in the discipline, as elsewhere in other branches of study. This disenchantment with the philosophy of causality led to the great popularity of the alternative concept of geography as chorology. Thus, in his famous essay on "The Morphology of Landscape" Carl Sauer (1925), represented geography as "a science that finds its entire field in the landscape." Geography, he maintained, is concerned only to establish "the connections of phenomena" in the visible landscape, and these connections are results of spatial association rather than of some hidden causality. "Causal geography", Sauer asserted, had its day, and he now strongly pleaded the case for establishing geography as a "positive science." In the minds of many geographers causality was still so uncomfortably close to the discredited thesis of environmental determinism that Hartshorne was anxious to present geography as a science concerned with "the functional integration of phenomena" rather than with "the processes of particular kinds of phenomena" (Hartshorne, 1939, p. 593). Reiterating geography's commitment to the discovery of spatial associations, Hartshorne described geography as a "naive science" which looked at "things as they are actually arranged and related" (Hartshorne, 1939, p. 549). The net result of all this was that geography "continued to be confined to the demonstration of regularities – or 'simple correlation' – and was not permitted to disclose causalities" (Gregory, 1978, p. 30). Under these conditions, although geographers continued to pay lip sympathy to geographical concerns with earth-environment, the geographer's concern with the environment declined. Geography now ceased to be a useful, environmental science.

The Schaefer-Hartshorne dispute and the emergence of a "new" geography in the 1950s hardly meant any change in this regard. Since they both emphasized upon "the geometry of the landscape" (i.e., patterns), and both "excluded any conception of process from geographical inquiry" (Sack 1974, p. 452); it is hard to see how Hartahorne's "simple correlations" differ from Schaefer's "morphological laws" in that they can both be reduced to spatial patterns. The two scholars differed only with regard to the status to be ascribed to the two sets of studies in geography. "*In principle*, therefore, their disagreement was about ends and not means" (Gregory, 1978, p. 32).

The situation pertaining to the geographer's concern with the environment changed for the worst when in subsequent years spatial theory, psychology, and quantitative methods were combined into what came to be called "new geography", since the geographer's essential obsession with the geometries of space continued. Besides, the inversion of methodology that the new craze for quantification created, almost ensured that "the researcher remains in a methodological framework where one can examine only surface appearances of social reality."

However, by the mid-1960s the pot had started boiling. Now the Vietnam war and the related developments in the U. S. A. had created a general disenchantment with the ivory tower character of the social science disciplines; and by the end of the decade the condition of mankind had emerged as a major concern of the social science disciplines. In geography this became reflected in a growing emphasis on contemporary social problems, relevance in research, and participation in public policy formulation. Considerations of equity and social justice began supplementing those of economic efficiency previously adopted in passing judgements on spatial arrangement of human activity. With a heightened concern for societal utility, it began to be widely felt that "there should be less emphasis on the traditional academic roles of understanding processes, searching for verification of hypotheses, or generating new ideas, and more on application of what is already known. (And it was now generally felt) that the geographer should play an active role in persuading society to policies based on his latest findings, or his current generalisations and theories" (Taafe 1974, p. 11). As Kenneth Hare put it, it no longer matters whether sequent occupance is a useful concept, or whether factor analysis is a better analysis. "All that matters is that we bend our wits to help put things right, even if we feel in our bones that is hopeless" (Hare 1970, pp. 452–53).

This widely shared feeling led to shift in the objects of study in geography from supermarkets and highways to poverty and inequity. And a new generation of geographers now began to "see the objective of geography as the same as that of medicine – to postpone death and reduce suffering" (Kesperson, 1976, p. 11). Many now felt that in order to achieve the goal of a more socially relevant geography, geographers would have to rebuild their discipline based on the centrality of man-environment interactions; with a new brand of physical geography that leans heavily on biological ideas and sources. As Hare put it, "We must assert the old, essential truth that geography is the study of the earth as the habitat of man, and not some small sub-set of that gigantic theme" (Hare, 1977, p. 266).

Towards the end of the 1960s, the American public was overwhelmed with declarations of an impending environmental crisis, so that by mid-seventies there was a definite move towards "a more sophisticated and deliberate search for environmental understanding. (Thus leading to a stage where) Ecology has been institutionalized" (Mikesell 1974, p. 1). But despite this increased interest, the geographical contribution to the study of environment (or to environmentalism) has remained meagre, and "the debate on this most relevant of all issues has attracted remarkably little attention from geographers" (Mikesell, 1974, p. 19). This observation made ten years ago is still largely true, though there is a definite stir so that *even* we in India have become concerned.

Works on man-environment relationships that initially came to light as a result of this heightened concern for the environment, were of two types. The first, in the traditional mode, was concerned with geographical description and analysis. Representative efforts of this nature were the edited volumes of Manners and Mikesell (1974), and Berry and Horton (1974). The second type focussed more precisely on issues of environmental management (D'Riordan, 1971a, 1971b), with particular emphasis on its economic aspects since, as Kates (1972, p. 519) pointed out, economics provided the theories and prescriptions of the 1960s. Since the late seventies the emphasis changed to ecology, ecosystem, and preservation of the environment with a view to maintain healthy ecological balance. Air pollution and general environmental degradation as a result of indiscriminate exploitation of resources, have attracted attention of many scholars. Pedagogs have called for the need for geography to reframe its curricula to meet the new challenge of Environmental education.

II

GEOGRAPHY AND CHALLENGE OF ENVIRONMENTAL EDUCATION

One of the outstanding characteristics of our times is the headlong rush of science and technology leading to urban and industrialized economies; a development that has ushered a new era of prosperity to large sections of people through increases in production and expansion of job opportunities. But it has not been devoid of its banes for mankind. All large cities across the world face serious problems of air pollution and a host of rivers and inland lakes have become seriously polluted. Pesticides, once hailed as one of the greatest inventions of all times, have now posed threat of extinction to many species of fish and wildlife, and are thereby upsetting the natural balance.

The problem of environmental pollution and degradation has assumed serious proportions all the world over, in developed as well as the developing countries. While in the industrially more advanced societies of the West a general awareness of the problem has now been created so that governments have become responsive – even though largely through a pattern of "policy by crisis", in that long range comprehensive planning has generally been ignored – elsewhere even public awareness of the problem is lacking. What colossal havoc this lack of awareness can create is more than amply revealed by the December 1984 Bhopal gas tragedy. The technology for solving most of the environmental problems of modern times has no doubt been developed and has been in existence for sometime, but it has not been implemented owing to lack of public awareness of the dangers involved – a factory which may largely account for governmental indifference on the policy front. It is, therefore, rightly said that "many of our environmental problems are actually problems of human behaviour rather than problems of technology." (Swan, 1969).

One of the major tasks of environmental education, therefore, is to develop informed attitudes of concern for environmental quality and the process and nature of its deterioration One of the reasons for very low awareness of these problems is, for example, that air and water become progressively worse at a rate which is so slow that people "adapt" to it psychologically. Besides, most of the substances which pollute our atmosphere are colourless and odourless so that they are not easily recognizable until very high levels are reached. "An appropriate analog to our present response to environmental problems is that of a frog hopping into a Kettle of cold water placed on the stove. Because the frog is a cold-blooded animal capable of adapting to different temperatures, if the water temperature rises slowly enough he can be killed by boiling before he becomes concerned about his condition". (Swan, 1969).

Creating concern for environmental problems should be taken as part of geography curricula in schools. A comprehensive programme of environmental education should go far beyond the traditional concept of conservation of resources. It should inculcate awareness of and concern for man-made environmental problems, such as, air and water. pollution, improvement of the countryside, problems of over-irrigation, soil depletion, over grazing, indiscriminate use of pesticides and the like; and in the context of cities, the problems of slums, inequitable geographical distribution of civic amenities, traffic congestion etc. Thus, "Environmental education may be conceived as being directed toward developing a citizenry that is knowledgeable about its environment and its associated problems, aware of the opportunities for citizen participation in environmental problem solving, and motivated to take part in such problem solving" (Swan, 1969).

Environmental education must start from the early school stage. For this it is necessary that geography syllabii are closely integrated with those of science and biology so that there is no duplication of effort in the teaching of the environmental processes, ecosystem, and ecological balance etc. One of the tasks of the geography teacher should be to create in the pupil awareness about real world problems. This can be accomplished through properly designed field work in local geography wherein problems of environmental deterioration could be highlighted. Care should be taken that there is separate time allocation for environmental education and study of local geography. This may be made a cooperative venture under the leadership of a well informed geography teacher. In order that the work is done meaningfully, the project should first be taken in a few well-equipped schools but only after a well-designed teacher orientation programme has been imparted by experts in fields of ecology, pollution and environmental management so that environmental education, like most of geography education in the country at present, does not remain a mere ritual.

While at the lower levels in schools it shall be more logical to concentrate upon creating awareness about and concern for the quality of the physical environment and environmental protection; at the secondary school level the student could be introduced to environmental degradation resulting from socio-economic factors with reference to problems currently faced by the people in the hinterland of the school. In rural areas these could include problems pertaining to soils, prevention of gully erosion, deforestation, water logging due to over-irrigation, and problems posed by the agricultural technology in practice. This would appear also to be the right stage for the student to start probing reasons for, and the ways of putting a stop to, large-scale exodus of population in the younger age groups to cities and towns. In the case of schools located in urban areas, issues pertaining to urban plight and rise of slums and ghettos, and spatial inequities in the quality of public health services and similar other problems could be highlighted with a view to groom students into concerned citizens of the future. This may also be the right stage to impart knowledge about the nature of environmental degradation caused by industrial pollution. This could be continued upto the "plus two" stage.

Students graduating from these secondary schools should be sufficiently alive to the physical as well as socio-economic problems of the environment. As such they should be adequately prepared to take up field work in the hinterland of their colleges and to complete projects on specified topics. Project work should form an essential component of undergraduate training in geography. Given the standard of training of the existing generation of college teachers, a well-designed orientation programme for teachers manned by personnel drawn from various specializations – and not merely by whatsoever happens to form the faculty at the host institution, irrespective of status and standing as scholar, as presently in practice – shall be desirable. This orientation should include imparting of knowledge to teachers in the processes involved in socio-economic and physical environmental degradation of rural and urban areas under the supervision of nature experts in the respective fields. A team of researchers in geography may sit together to identify major gaps in the geographer's training in this regard with a view to underline the nature and objective of the courses to be offered by respective subject experts. The range of topics covered under the "citizens' report" on *The State of India's Environment, 1982,* should give a fair idea of our needs.

Field work should appear as a must if we want to put the environment back into geography. Unfortunately owing to the manner in which geography teaching has developed in India, field work has been at a complete discount. Without field work the student cannot meet the environment face to face – a confrontation without which the much needed sensibility about and concern for the environment cannot begin. And this "meeting" with the environment must begin right at the elementary school stage. For this the student need not go far. Extended walks through chosen areas around the school on weekends under the supervision of a well-informed teacher should initiate a sense of awareness for the local environment in the child. Similarly the school site provides a good enough laboratory for field work wherein the student could be got involved in probiems of site improvement and landscaping, something that in fact was, in a way, in practice under the scheme of basic education in the years immediately preceding independence (at least in the government-run established village schools, of one of which I have personal memories). We can learn from the experience of some other countries where considerable progress has already been made in the field of environmental education. In the Ann Arbor school system in the United States, for example, "Typical activities of school-site development programs are planting of wind breakers, planting shrubs and trees for beautification and to attract wild-life, constructing ponds, and building mounds to add diversity to the site and increase opportunities for creative play. In each case, students carry out a major share of the planning and developing activities. Moving into the secondary grades, (The students) are beginning to study local environmental problems throughout the community" (Swan, 1969).

Our University syllabii is geography would require thorough restructuring so that background knowledge about landforms and climate etc. at the undergraduate/honours level is made comprehensive enough to require no repetition of these in the form of compulsory courses at the postgraduate level. Their place could then be taken by a broad-based foundation course on Environmental Processes, Ecology, Ecosystem and Environmental Management. The time (usually two semester units) devoted to traditional physical geography may be more gainfully devoted to Environmental Education. A word of caution would appear necessary; before launching upon any programme of instruction on this topic proper reading material must be made available otherwise we shall be producing "excerpts" without knowledge and understanding.

This would appear to be the right place to add some concluding remarks about the scope and objective of a basic programme of instruction on environment at the advanced level. Following Soviet geographer Gerasimov (1983), the most important objectives of basic research in geography on the environment may be identified as:

1. All round optimization of the quality of human life by protecting and improving the properties of the environment;
2. Wasteless technology in industry and agriculture, and closed cycles of water consumption for the elimination of harmful wastes;
3. More rational use of natural resources, particularly of water and soil and biological resources, notably their protection, restoration, and extended reproduction;
4. Protection and preservation of the entire genetic fund of biota.

"The contents" of the major scientific branches of ecological studies in geography, according to Gerasimov, are:

1. Control over changes in the environment attributable to human activities (anthropogenic monitoring);
2. Scientific geographic forecasts of the consequence of economic activities on the environment;
3. Anticipation, attenuation, and overcoming of natural catastrophes;

Thus, a strong case is made out for developing geography into "the science of a *planned transformation and regulation of the environment* for man's continued existence and development."

III

Although the man-environment theme in geography may be traced back to the earliest beginnings of geography as a discipline, the current call for developing the subject into an environmental science – and its underlying philosophy and theory -- is altogether different in nature from the earlier man-environment relationships theme pursued under the leadership of Ritter, Ratzel, Blache, or Barrow. These earlier scholars were essentially concerned with questions regarding how far and in what manner the natural environment enters into the shaping of the course of human development in different areas of the earth surface – paying due attention to a proper scientific understanding of the processes of environmental dynamics so that a close liaison between physical and human geo graphy had been maintained. There was, however, no consciousness of the problems that arise from man's impact upon the environment, nor indeed was there any occasion to feel concerned about environmental degradation or ecological imbalances. Until our own time of rapid technological development following worldwide spread of the "benefits" of industrial revolution and establishment of worldwide system of quick transport and communications, the life of human communities the world over was tied essentially to the local environment. Man lived close to nature, deriving his existence from the soil and the forest of his own native area and taking due care that these remain intact for the next year's crop and the necessary quota of firewood and timber. Though in the process the environment did get damaged to some extent, nature was by and large able to cope with the relatively slow pace of human intervention so that environmental damages were restored in the usual process of nature. Ideas about conservation, in the contemporary sense, were therefore not relevant to those times.

In the post-industrial revolution period of the rising economies of scale following the emergence of ocean-borne world-wide trade and commerce, all this materially and drastically changed. The intimate relationship between man and his environment established through tens of centuries of adaptation and understanding, was now broken. The watch-word of the industrialized nations of the West became: "you cannot expect favours from nature; you must take them"; because large-scale economies were possible only through large-scale exploitation of natural resources. By this time revolutionary developments in science and technology had also added tremendously to man's ability to extract and use natural resources at rates many times faster than nature's capacity to restore them, so that our environment got progressively deteriorated to the point of adversely affecting the quality of life in the areas concerned. Secondly, as a result of large-scale industrializaticn and urbanization, profound physical and chemical transformations take place which, together with the parallel process of discharge into the environment of various kinds of wastes (including some poisonous ones), further compound the processes of environmental deterioration, so that today the consequences of industrialized society's impact on the environment constitutes one of the most pressing set of problems of survival. These problems pertain to protection, conservation, and transformation of the environment with a view to ensuring better prospects for the future.

A word of caution may be necessary here. "While there is little doubt that production techniques, the development of synthetic 'unnatural' substances and the use of energy-intensive technology have all added to the demand placed on natural systems, it is clearly too simplistic to cast advanced technology in the role of sole or even the major villain. Many of the most intransigent problems – soil erosion, desertification, water scarcity, deforestation and the degradation of urban environment – do not necessarily involve the application of sophisticated production technologies applied at scales incompatible with natural regenerative systems or with the economic and administrative capacity of society. Moreover, it is not meaningful to view technology as an autonomous cause separate from economic growth which powers it and in turn is powered by it" (Rees, 1984, p. 288).

Another important point to note is that problems of environment pollution and degradation, although of universal occurrence, defy universal solutions so that aggregation of the plurality of environmental concerns into one "package" has not proved satisfactory. "The diversity of socio-economic, political and administrative contexts in which environmental problems occur ensures that there are no universally applicable causal explanations (except at a level of generality and theoretical abstraction which has little practical relevance), no overall agreement about their importance and no panacea" (Rees, op. cit, p. 289). The nature and intensity of environmental problems of the highly industrialized and technologically advanced regions of the developed world are, for example, intrinsically very different from those of the less developed countries (LDS). In a general way, "it may be said that developed country environmental problems are caused by an overindulgent and wasteful pattern of consumption (and production) without considering environmental spillover, while developing country environmental problems are the result of poverty and under-development" (Ahmed, 1976, pp. 226–227). The two, therefore, call for materially different approaches to solution.

This basic distinction between pollution of affluence and of poverty must be kept in mind. In the less developed countries where pollution of poverty is the general rule, "it is the lack of, and the misallocation, of those resources essential to enable human beings to survive at baseline standards of living that must be the priority concern ... A complex of economic, social, demographic, institutional and political circumstances have combined to create the basic problems of meagre water supplies, poor sanitation and nutrition, insufficient housing and transport services, debilating disease and fuel shortages. A history of the Green Revolution has shown that any attempts to solve such problems by technological and financial packages are doomed to failure unless accompanied by sensitive analysis of the underlying socio-economic and political relationships" (Rees, 1984 op. cit.). Like poverty, the problem of pollution, therefore, is also essentially a socio-economic problem, and it requires to be viewed from that perspective. And this calls for a thorough understanding of the complex interaction between nature, and socio-economic and political systems in the specific contexts. Here is, therefore, a challenging task calling for the geographer's holistic perspective on man-environment interaction.

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