

ON THE NATURE OF PHYSICAL GEOGRAPHY<sup>1</sup>RAJMUND GALON<sup>2</sup>

## ABSTRACT

Galon, R. 1983 On the nature of physical geography. In: J. H. J. Terwindt & H. Van Steijn (eds): Developments in physical geography – a tribute to J. I. S. Zonneveld – Geol. Mijnbouw 62: 535-536.

The author considers the position of elementary sciences of the geographical environment, geomorphology, climatology, hydrography, biogeography, pedogeography or geography of soils, relative to physical geography and the other Earth sciences. Then he discusses the problem of contents and range of physical geography and its sub-disciplines.

## INTRODUCTION

The development of Earth sciences and of their research methods adds new directions and points of view to the traditional system of sciences. The particular sciences lose their character of individual compact scientific disciplines and assume the features of a group of sciences. Simultaneously these new sciences, which have only recently become distinguished, come nearer to other group of sciences by reason of their specialized topics of research, and create new substantial relationships.

## THE TOPICS OF PHYSICAL GEOGRAPHY

This well-known evolution can be illustrated by the example of physical geography, which in spite of the considerable specialization of its branches, seems to have preserved its traditional character of a vast science including geomorphology, climatology, hydrography, biogeography and pedogeography. It is presumed that all these disciplines are fully independent, as each has its own objectives, a well-defined range of interests and its own research methods. On the other hand, if, according to what has just been said, the above disciplines compose a system of related sciences, it certainly is not physical geography, which has its own particular objectives and its own research methods, but rather a group of sciences which could be defined as a system of elementary sciences of geographical environment. This is by no means a new idea, but considering the all too frequent treatment of physical geography as a collection of geomorphology, climatology etc., omitting the proper objectives of the physical geography (except complex physical geography), this idea deserves at least mentioning and substantiation.

There can be no doubt that the object of physical geography is the surface of the Earth as a complex of interacting exogenic factors intensified or diminished by endogenic processes and

as a complicated and varying reflection of the effects of that interaction. That dynamically varying geographical surface is referred to as geosphere or epigeosphere, also named geographical cover (KALESNIK, 1958). On the other hand, the elementary sciences of the geographical environment, such as geomorphology, climatology etc., are known to deal with the particular processes and their effects on the Earth's surface. The dissimilarity of the lines of research of physical geography and of the elementary sciences of geographical environment is illustrated by figures 1 and 2.

This dissimilarity of topics of investigation does not exclude some interrelationships between physical geography and the elementary sciences of geographical environment. Physical geography confirms that the components of geographical environment exist and change in mutual relationship. Geomorphology, climatology and the other sciences cannot study a given element of geographical environment without taking into account that interdependence. For instance, one cannot study landforms without considering their formation under given climatic, hydrographic or vegetable conditions. On the other hand, physical geography takes information from the particular elementary sciences of the geographical environment on the mechanism of action of one environmental element on others.

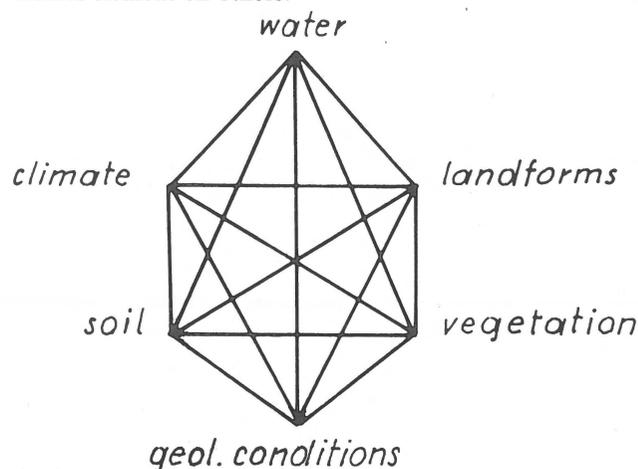


Fig. 1  
Point of view on physical geography.

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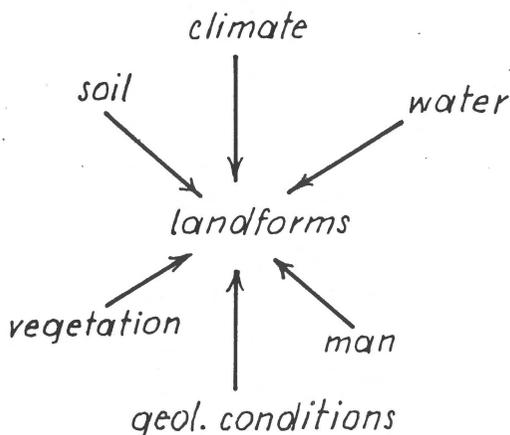


Fig. 2  
Geomorphology as one of the elementary sciences of the geographical environment.

Moreover, what is particularly noteworthy, the elementary sciences of the geographical environment are to a larger extent related with other Earth sciences, viz., geomorphology with geology, hydrography (now more and more frequently though wrongly called hydrology) and climatology with geophysics, and biogeography and pedogeography with biology (see Table I, columns A & B). It is impossible to be engaged in modern geomorphology without a good knowledge of many geological disciplines, such as sedimentology, lithology, or structural geology. At the universities of some countries, geomorphology is connected with geology even in faculty and institution, climatology with meteorology is taught within the framework of physics of the atmosphere, and hydrography comes within the scope of hydrological or water management institutions. Depending on the individual interests of a given researcher, we can also speak of a more geological – e.g. structural geomorphology – or more geographical geomorphology – e.g. climatic geomorphology –, and of a more geographical or more geophysical hydrography. In the latter case we are dealing rather with hydrology.

Physical geography (Table I, columns C & D) in the present-day meaning of the term is one of the Earth sciences, of the order of geology or geophysics (Table I, column A). It is also counterpart of social and economic geography in the system of geographical sciences (column E) and consists of a number of specialistic domains (column D). They assume

Table I The position of the elementary sciences of the geographical environment relative to physical geography and the other Earth sciences.

A	B	C	D	E
geology	geomorphology		phys. geogr.: general, regional,	socio-economic geography
geophysics	climatology hydrography	physical geography	historical, dynamic, complex or landscape science	
biology	biogeography pedogeography			

the status of serious sciences, comparable in rank to that of the particular elementary sciences of the geographical environment.

*General physical geography* is concerned with the evolution and present-day relief of the Earth's surface, the general budget of temperature and moisture, the zonality and azonality (i.e. with the most general problems referring to the physico-geographical face of the Earth), with an indication of further changes effected by human activity. General physical geography has recently benefitted from the advances in satellite photography and teledetection.

*Regional physical geography* considers the particular continents and ocean basins, ascertaining their physico-geographical particularities.

*Historical physical geography* – which can be considered as *paleogeography* – deals mainly with the changes and transformations of geographical landscape during the Quaternary, depending on the successive cold – glacial – and warm – interglacial – periods with particular consideration of the varying extent of inland ice, the eustatic fluctuations of sea level and the shifting of landscape zones.

*Dynamical physical geography* studies the movement of matter and the rhythmic processes in geographical environment, taking into account physical processes (geophysics of landscape), chemical processes (geochemistry of landscape) and organic processes (biology of landscape).

*Complex physical geography*, also called landscape science, establishes the divisibility of the epigeosphere into geocomplexes, ascertains the multistage structure of geographical environment and deals with physico-geographical regionalization, considering also its practical value (KONDRACKI, 1969).

CONCLUSION

Physical geography is traditionally treated first of all as a group of sciences as geomorphology, climatology etc. (column B). It is, however, more correct to define these disciplines as fully independent elementary sciences of the geographical environment. Physical geography is one of the great Earth sciences of the order of geology and geophysics. It is divided into general physical geography, regional physical geography etc. (column D). Physical geography as a whole plays an important part in the Earth sciences. It reveals and systematizes the vast and multistage mechanism of interaction of factors of the geographical environment and it points to its diversity in space as well as in time, while the epigeosphere is increasingly being transformed by the action of man.

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