Methodological Dilemmas of Geography*

The analysis of the state of Polish geography and tendencies of its development requires a methodological cogitation pertaining to the cognitive and social situation of geography as a scholarly discipline.¹ The aim of this paper is to show opposing standpoints pertaining to only some methodological problems that refer to the cognitive structure of geography. These problems comprise: 1) the investigative goal of geography, 2) the separate character of geography, 3) the investigative results of geography, and 4) the characterization of explanation in geography.

The analysis of these problems is based on the reconstruction of basic epistemologico-axiological assumptions that underlie them. Such reconstruction aims to explain or interpret the main ideas and premises pertaining to the structure of knowledge and the investigative procedure in geography which takes the form of model standpoints and their types. These standpoints are shown in the form of opposing propositions which comprise the names and compositions of the standpoints and a generally outlined qualification of the undertaken dilemmas.

1. THE INVESTIGATIVE GOAL OF GEOGRAPHY

What is the basic investigative goal of geography as a scholarly discipline, or what needs does geography serve? From the methodological point of view two basic standpoints give answers to these questions: that of 1) cognitivism and that of 2) practicism.

The standpoint of cognitivism assumes that the basic goal of geography

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¹ Cf. A. Kukliński, Dylematy rozwoju nauk geograficznych w Polsce (Dilemmas of the development of geographical sciences in Poland), *Biuletyn Komitetu Przestrzennego Zagospodarowania Kraju PAN*, 118, Warszawa 1982, pp. 230-244.

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is cognitive in character. ² It is determined by the realization of cognitive values of science. It is usually said that the primary cognitive value of science is the attainment of truth, the acquisition of the true picture of the world. According to J. Such, "to state that truth constitutes the aim of science is in principle correct but banal. A scholar does not aim at just any truth". ³ The adequacy of scholarly cognition is conditioned by the realization of cognitive values within the framework of science itself, namely, certainty, coherence, generality, simplicity and a highly informative content of knowledge. ⁴

The standpoint of cognitivism has two variants: 1a) pure or contemplative cognitivism, 1b) activistic cognitivism.

Pure cognitivism assumes that geography serves the acquisition of knowledge, i. e., the realization of cognitive goals which are of internal character, i. e., they are within the framework of geography itself, irrespective of its utility. These aims are: the description and/or understanding or explanation of certain properties and components of the world. The realization of these aims is obviously not uniform, especially in the case of such aims as the generality and informative content of geographical knowledge.

Activistic cognitivism assumes that geography serves the realization of not only the internal aims of science (the description and understanding or explanation of reality) but also of the external aims, namely the anticipation (forecasting) and monitoring of the course of events and processes in order to change the world and organize it better.

The standpoint of *practicism* is expressed in the view that the main aim of geography is to make practical activities (extracognitive practice) more efficient. "Practical activity means an activity undertaken in order to cause or maintain a specified state of affairs in a certain natural or social system". ⁵ Practical activities within the field of interest of geography may comprise not only activities aiming at changing the natural environment (e. g. building of a strip mine, regulation of the course of a river, a plan of spatial development of

⁵ A. Siemianowski, *Poznawcze i praktyczne funkcje nauk empirycznych* (Cognitive and practical functions of empirical sciences), Warszawa 1976, p. 51. a town), but also activities aiming at maintaining the existing state of affairs (e. g. a plan to maintain a high quality of the environment at a factory building site).

The standpoint of practicism exists in two variants: 2a) constructivist practicism, 2b) applicational practicism.

Constructivist practicism assumes that geography can directly solve practical problems, i. e. problems pertaining to practical activity, by constructing designs (plans) of maintaining or altering states of affairs or processes and defining the ways of their realization.

The standpoint of constructivist practicism is not very real in geography; its consequences are negative as 1) it leads to an inadequate and ineffective modification of the problem scope of geography shifting its weight on problems of little cognitive value and not large practical one; 2) it creates an illusive view in public opinion that geographers are capable of obtaining serious practical results, which, in confrontation with the actual results, lowers the prestige of geography; 3) it decreases the potential cognitive abilities of geography by introducing practical pseudo-problems.

Applicational practicism assumes that geography can indirectly contribute to the solving of practical problems through a correct use and application of geographical knowledge. It consists in 1) supplying initial information of diagnostic character, 2) building prognoses, 3) building optimal models of systems and processes.

The standpoint of applicational practicism expresses itself in so-called applied geography.⁶ Here two trends exist: 1) treating applied geography as a separate branch of geography directed at practical aims;⁷ 2) treating applied geography as a set of practical problems which can be solved on the basis of geographical knowledge.⁸ The latter trend seems to correspond better to the proposition of applicational practicism and the possibilities of applying geography to practical aims, especially to planning.⁹ Thus, the most important problem here is an adequate stock of geographical knowledge or possibilities of acquiring it.

The problem of applying geographical knowledge to practical aims has

² K. Ajdukiewicz, Zagadnienia i kierunki filozofii (Problems and trends in philosophy), Warszawa 1949, pp. 15-16, states that: "The term 'cognition' refers to both certain cognitive acts and cognitive results. (...) Both cognitive acts and cognitive results undergo evaluation. We evaluate them from the viewpoint of their truth or falsity, we also evaluate them from the viewpoint of their justification". A. J. Ayer (*The problem of knowledge*, Harmondsworth 1961, Polish transl.: *Problem poznania*, Warszawa 1965, p. 42) writes that "... The necessary and sufficient conditions for knowing that something is the case are first that what one is said to know be true, secondly that one be sure of it, and thirdly that one should have the right to be sure".

³ J. Such, *Wstep do metodologii ogólnej nauk* (Introduction to the general methodology of sciences), Poznań 1969, p. 16.

⁴ J. Such, *O uniwersalności praw nauki* (On the universality of the laws of science), Warszawa 1972, p. 11.

⁶ The conception and programme of applied geography is presented by S. Leszczycki, Geografia stosowana czy stosowanie badań geograficznych dla celów praktycznych (Applied geography or application of geographical research for practical purposes), *Przegląd Geograficzny*, 34, 1, 1962, pp. 3-23.

⁷ This variant is presented by O. Tulippe, La géographie appliquée, Bulletin de la Société Belge d'Etudes Géographiques, 25, 1, 1956, pp. 59-113.

⁸ This trend is presented by M. Phlipponneau, Géographie et action: Introduction à la géographie appliquée, Paris 1960.

^o Cf. B. Malisz, Rola badań geograficznych w planowaniu przestrzennym (The role of geographical research in physical planning), *Przegląd Geograficzny*, 49, 2, 1977, pp. 319-331.

two aspects: 1) of the scope, 2) of the type (standard) of knowledge. The aspect of the scope of knowledge refers to the choice of those investigative problems which are of practical importance, e. g. problems pertaining to water economics or the town system. The aspect of the type (standard) of knowledge refers to the cognitive quality of knowledge, e. g. the level of theoreticalness.

The formation of the aspect of scope is preferred in both the sphere of considerations on applied geography and the work done within the domain of scholarly policy (in Poland government projects, key projects, etc.). The problem of the standard of knowledge is entirely undersetimated.

The controversy between cognitivism and practicism takes on a different character depending on which variant of each of these standpoints is accepted. In the relation pure cognitivism (1a) — constructivist practicism (2a) this controversy shows incompatible standpoints; in the relation activistic cognitivism (1b) — applicational practicism (2b) the controversy is of complementary character.

By stressing the cognitive function activistic cognitivism limits the scope of application to well-grounded knowledge and subordinates activity to cognition. Applicational practicism, on the other hand, stressing the practical function, limits knowledge to that which is practically useful and subordinates cognition to activity. Both these standpoints may be treated as two components of socially committed science, of which one defines, unlimited by the scope of practice, cognitive possibilities of geography and the standard of this knowledge, while the other widens the scope of problems to practical ones taking into consideration the possibility of solving them.

2. THE SEPARATE CHARACTER OF GEOGRAPHY

What does the separate character of geography as a science consist in? There are two basic standpoints in this respect which we shall conventionally call: 1) objective separatism, 2) subjective separatism.

The standpoint of *objective separatism* sees the separate character of geography in the structure of reality which is the object of cognition, or in the methods of examining it.

This standpoint has two variants: 1a) substantial, 1b) methodological.

In the *substantial* variant the separate character of geography is defined by its domain, which consists of specified types of objects and their properties. The objects are represented by two formulations: systemic and attributive.

In the *systemic* formulation geography differs from other sciences as to the type of objects it examines. The subject of geography are material objects which have the character of real systems, i. e. highly complex objects whose components are so interrelated that they form a certain whole separated in relation to the environment.¹⁰ The systemic formulation of the subject of geography has a number of interpretations: a global man-environment system, a geographical system, a geosystem, a spatial system. The idea of the global system has been formulated by E. Ackerman, who states: "the universe treated by geographers is the world-wide man-natural environment system." ¹¹ Geographical systems according to Yu. G. Saushkin and V. S. Preobrazhenski are "systems which have formed on the surface of the Earth due to both natural and social processes, and as a result of interaction between them." ¹² With the help of the idea of a geosystem geographical landscape is also reconstructed. ¹³

Although the hitherto existing ideas of specific objects of the domain of geography as systems are not uniform and sufficiently precise, they are the only realistic and consistent attempt at defining substantially the domain of geography.

In the *attributive* formulation the subject of geography are not the objects themselves but certain kinds of object properties. The notion of a property comprises, besides real features of objects, also relational features, i. e. real relations taking place between objects. The attributive version is represented by two conceptions: chorological and interactionistic.

The chorological conception reduces these properties to spatial relations which take place between objects. The conception seeing the subject of geography in the examination of spatial relations (spatial distribution, spatial differentiation, location etc.) is strongly grounded at present. It originated from Kant, who understood geography as a science engaged in relations coexisting in space.¹⁴ It is best formulated by K. Schaefer, who states that the geographer: "must pay attention to the spatial arrangement of the phenomena in an area and not so much to the phenomena themselves. Spatial relations are the ones that matter in geography and no others."¹⁵

¹⁰ This conception of a system is based on the assumption that the whole reality comprises an infinite multitude of concrete objects which form concrete systems consisting of components interacting with one another. This conception renders more adequately intuitions which exist in the understanding of a system on the ground of biological and social sciences.

¹¹ E. Ackerman, Where is a research frontier? in: W. K. D. Davies, ed., *The conceptual re*volution in geography, London 1972, p. 272.

¹² Yu. G. Saushkin, V. S. Preobrazhenski (Polish transl.), Dyferencjacja i integracja nauk geograficznych w perspektywie (Differentiation and integration of geographical sciences in perspective), *Przegląd Zagranicznej Literatury Geograficznej*, 4, 1979, p. 62.

¹³ Cf. D. L. Armand (Polish transl.), Nauka o krajobrazie (The science of landscape), Warszawa 1950, p. 27.

¹⁴ I. A. May, Kant's concept of geography and its relation to recent geographical thought, Toronto 1970, p. 151 and 251.

¹⁵ F. Schaefer, Exceptionalism in geography, a methodological examination, Annals of the Association of American Geographers, 43, 1953, p. 228.

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The interactionistic conception, on the other hand, sees these properties in the interaction that exists between nature and society.

In the methodological variant the peculiarity of geography expresses itself in definite conceptions of investigative methods. This variant is expressed in two conceptions of methods: a geographical method and a regional method.

The concept of a geographical method consists in the spatial and geophysical formulation of various phenomena. The concept of a geographical method, although it comes from F. Ratzel, is nowadays formulated mainly outside geography.¹⁶

The concept of a regional method is based on the formal notion of a region and expresses spatial differentiation and integration of phenomena. "The regional concept is applicable, and the regional method is used in fact at every level of geographic study — states R. Hartshorne — along the continuum from that of the study of most elementary integrations (the extreme topical approach) to that of maximum integration (the extreme regional approach)."¹⁷

The standpoint of *subjective separatism* sees the separate character of geographical knowledge in the domain of research conducted by geographers as members of the community of scholars. This is expressed in the slogan that geography is what geographers are doing. This view is of purely reporting character and helps neither understand nor explain the investigative field of geography and geographical knowledge. Such bases should be looked for in the domain of investigative competence of geographers, whose membership of the social group of geographers-scholars is determined by specified social conventions. Consequently, one would be able to define the scope of problems designating the investigative field of geography which geographers would be able to solve.

In any case, the acceptance of the subjective conception leads to social authoritativism, which expresses itself in the fact that it is the social status of a knowledge-maker that decides on the character of it.

The controversy between objective and subjective separatism is of crucial character since, pertaining to the problem of delimiting the investigative field of geography, it states the way of defining the basic notions and assumptions that constitute the so-called pretheory of the discipline, which defines its main inves igative problems and explains the scope of geographical knowledge. The strongest standpoint in this respect is represented by objective separatism in its substantial variant, which formulates characteristic ontological assumptions referring to the character of objects being examined or their properties. The weakest standpoint is represented by subjective separatism, which does not formulate such principles but adopts an instrumental position. The basic criterion that the characterization of the domain of geography or its pretheory should meet is the maximal explanation on its basis of the scope of the investigative problems of geography and ensuring its openness, which is expressed in its innovative chances, i. e. in the possibility of investigating new aspects of reality.

3. THE INVESTIGATIVE RESULTS OF GEOGRAPHY

What investigative results are desired in geography? The analysis of answers to this question leads to the distinguishing of two basic standpoints: 1) descriptivism, 2) theoretism.

The standpoint of *descriptivism* sees such results in the form of cognitive description. ¹⁸ According to D. Harvey, "Under this heading (i. e. that of cognitive description) are included the collection, ordering and classification of data. (...) Cognitive description may thus range in quality from simple primary observations through to sophisticated descriptive statements." ¹⁹ R. Hartshorne, the main representative of this standpoint, understands the purpose of geography as "... the study that seeks to provide scientific description..." ²⁰ It should be, however, pointed out that apart from empirical description one can also find in geography elements of evaluating description, especially in the form of utilitarian evaluations (e. g. those based on bonitational methods).

The standpoint of descriptivism has two basic variants: 1a) regional descriptivism, 1b) problem descriptivism.

Regional descriptivism assumes that regional description is the final result of geographical research. The concept of regional description is not, however, clear enough, it is closer to narrative description than to classificational one. The main components of regional description seem to be: 1) delimitation of specified regions according to the accepted conception of regionalization, 2) synthetic characterization of regions from the viewpoint of integration of objects or processes taking place within them. Such description comprises, next to individual statements pertaining to states of affairs and processes, reporting statements, both detailed and general.

¹⁶ Cf. J. Topolski, Methodology of history, Dordrecht 1976.

¹⁷ R. Hartshorne, *Perspective on the nature of geography*, Chicago 1959, p. 129. Cf. also A. Wróbel, *Pojęcie regionu ekonomicznego a teoria geografii* (The notion of economic region and the theory of geography), Prace Geograficzne IG PAN, 48, Warszawa 1965.

¹⁸ The notion of description is differently understood and takes a different form both on the ground of methodology and the investigative practice of geography. The following are distinguished: observational description (base sentences which are the result of observation or an experiment), classificational description (the properties of the object under characterization as a representative of a certain class — genus or species), statistical description (total characteristics), diagnostic description (characteristics of the states of affairs with their evaluation), narrative description (characteristics of the states of affairs ordered in time and space).

¹⁹ D. Harvey, Explanation in geography, London 1969, p. 79.

²⁰ R. Hartshorne, op. cit., p. 172.

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Problem descriptivism aims at solving investigative problems in the form of results which are geographical generalizations, i. e. general statements, mainly statistical, of a spatially limited range, in the form of geographical names or geographical coordinates.²¹

The standpoint of *theoretism* assumes that theoretical knowledge is the final investigative result of geography. It is also assumed that theoretical knowledge is the condition of explaining — the basic cognitive aim of science. In a concise way, this is expressed in the thesis: "the quest for explanation is a quest for theory". ²² Theory construction is then the basic postulate conditioning the realization of the function of nomological explanation by geography and of the removal of the basic cause of its weakness and backwardness.

The standpoint of theoretism has two variants: 2a) empirical theoretism, 2b) evaluating theoretism.

According to *empirical theoretism* the standard of theory in geography does not differ basically from the concept of the theory which has established itself in natural science.

With regard to the above the problem of the character of theory in geography and the way of its construction emerges.

As far as the character of theory is concerned, two positions exist: restrictive and liberal. According to the restrictive position, theory should correspond to the main properties which theories of physics have. These are: 1) scientific laws as statements being part of a theory, 2) deductive-axiomatic way of relating and systematizing these statements, 3) explanatory and predictive character of the function of a theory. The liberal position does not take into account strict structural and logical rigours limiting them to: 1) the general character of statements, 2) the compatibility of statements with facts, 3) the prognostic function. The hitherto existing results show that in the restrictive position theories are reduced to general notional schemata that do not have a greater explanatory power. In the liberal position theories have a narrow temporal and spatial range of applications.

The way a theory is constructed, as any creative process, is not of a standard character and contains spontaneous elements. "Scientific theory construction — according to M. Bunge — is not a rule-directed activity although it is rule-controlled".²³ As far as geography is concerned two main trends of theory building have emerged: 1) model-theoretic, 2) model-heuristic. The model-theoretic strategy is linked to theory building through the construction of theoretical models understood as sets of assumptions which make ideal construction whose realization is to allow the explanation of facts. The results of this approach are still not satisfactory as "theories" obtained in this way take the form of notional schemata. And these constitute a group of categories of a small explanatory power. The greatest achievement in this respect has so far been W. Christaller's central place theory.

The model-heuristic strategy is based on the construction and empirical testing of different mathematical models (descriptive, optimization). This strategy has given rise to a number of theoretical conclusions, however, of a small degree of generality and range of application.

According to *evaluating theoretism*, geography formulates also axiological theories. These theories exist in two variants: 1) normative-optimization and 2) critical.

The standard of theory in the normative-optimization variant has been established in economy. The aim of this type of theory is not the explanation of facts but the description or indication of the ways (solutions) of the realization of specific aims. A special type of theories in the normative-optimization variant are mathematical theories and decision and operational models (the utility theory, the theory of games, the models of linear and nonlinear programming and others). These theories were found to be of interest to geography mainly in reference to the development of the location theory and transport models and recently also to the problems of natural environment.²⁴

These theories and models are mainly realized within the framework of regional science.²⁵ Their share in the structure of geographical knowledge based on the concepts of geography is still small.

The idea of critical theory was established in sociology on the basis of hermeneutic and phenomenological philosophy as a reaction to the empirical standard of theory.²⁶ One means here a survey on society as a whole in the historical perspective from the point of view of socio-political criticism and practice, i. e. not only in order to know what is happening but to realize what is to be done, how to plan and form the future which cannot be avoided,

²¹ Geographical generalizations make general statements which are numerically general sentences in whose wording proper (geographical) names or other spatial limitations which express their range, are present. If sentences of this type are made conditional, their antecedents do not give the conditions of the occurrence of phenomena presented in the consequents, but they only characterize the range of their occurrence.

²² H. Zetterberg, On theory and verification in sociology, Totowa 1965, p. 11.

²³ M. Bunge, The scientific research I, Berlin 1967, p. 459.

²⁴ Cf. W. Isard, Location and space economy, Cambridge Mass., 1956; D. M. Smith, Industrial location, New York 1971; M. J. Webber, Impact of uncertainty on location, Cambridge, Mass. 1972; M. Chisholm, In search of a basis for location theory, Progress in Geography, 3, 1971; G. F. White, Natural hazards research, in.: R. J. Chorley, ed., Directions in geography, London 1973.

²⁵ Cf. Z. Chojnicki, Problemy metodologiczne Regional Science (Methodological problems of Regional Science), *Przegląd Geograficzny*, 53, 2, 1981, pp. 267-283.

²⁶ The main representative of this conception is J. Habermas (*Theorie und Praxis. Sozialphi*losophische Studien, Neuwied 1963). Cf. also: Drogi współczesnej filozofii (The ways of contemporary philosophy), Warszawa 1978.

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without getting involved.²⁷ The crucial component of a critical theory understood in this way is the criticism of social ideology based on Marxist philosophy. In socio-economic geography the idea of critical theory got a response in the so-called radical geography which postulates that geography should get involved in the transformation of society through the criticism of ideologies (philosophical assumptions) underlying contemporary geography and especially certain social and economic assumptions (e. g. D. Harvey's criticism of land rent).²⁸

It should be pointed out that in a broader sense the concepts of critical theory were contained in the programme of geography by S. Leszczycki and especially in his postulate to link geographical investigations with the socialist building of social and economic life and an active part taken by geographers in this building.²⁹

The analysis of theories in geography shows that they are characterized by: 1) the dominance of empirical problems over axiological ones, 2) a low participation of scientific laws, 3) a narrow subject-matter range, 4) the existence mainly of theories of medium range which are not subordinated to more general theories.

The hitherto existing attempts at defining and characterizing theories in geography are not satisfactory. The main problems requiring solution are: 1) can a uniform standard theory be formulated in physical and socioeconomic geography? 2) do geographical theories derive from more basic (base) physical and socio-economic ones? 3) have these theories characteristic reference? 4) to what extent do the concepts of the theories derive from specific philosophical assumptions?

The controversy between descriptivism and theoretism in geography pertains not so much to the diagnosis of the state of geography as to the programme of its restructuring. This restructuring must, however, take into account restrictions imposed on the development of geography by its subjectmatter conceptions and research methods. The radical programmatic descriptivism which treats description as a desired global result of investigation, leads in consequence to the maintenance of geography at the proto-scientific stage, which limits its cognitive and practical functions. The radical programmatic theoretism, on the other hand, may lead to the formation of a methodological standard the realization of which goes beyond the subject-matter of geography and gives the results an extra-geographical character.

4. THE CHARACTER OF EXPLANATION IN GEOGRAPHY

What methodological character has explanation in geography? Two standpoints are distinguished in this respect: 1) nomological explanationism, and 2) extranomological explanationism.

Before these standpoints are presented, we must point out the controversies related to the conception and character of scientific explanation. As far as explanation is concerned, the widely differing views range between two extreme orientations: one assuming explanation as the basic methodological category and the main aim of science, and another generally disregarding explanation in the methodological analysis. ³⁰ We accept the first orientation mainly due to the fact that explanation determines the cognitive sense of science and the framework of an investigative procedure, and it also forms the basis for the opposition to the views treating science as a shortened description of facts and a technique of anticipation or only a tool of control over nature and man.

The notion of explanation is discussed in two main aspects: 1) the cognitive sense, 2) the logical form. The former sees the essence of explanation in the understanding of facts, i. e. rationalization of reality.³¹ The latter — in the character and logical structure of the answer to the question why a certain fact took place or why a certain regularity exists. The answer consists in giving a reason containing or constituting scientific laws, from which one could logically infer a sentence stating this fact or regularity.³²

In the methodological analysis, due to the influence of logical empiricism (neopositivism), the logical aspect of explanation is put to the fore, which, however, is criticised as only the consideration of both aspects — logical

³¹ Cf. M. Bunge, Causality, Cambridge 1959, p. 245.

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²⁷ J. Habermas, op. cit., 1963, p. 228.

²⁸ Cf. D. Gregory, *Ideology, science and human geography*, London 1978; W. Bunge, *Fitzge-rald: Geography of a revolution*, Cambridge, Mass. 1971; D. Harvey, *Social justice and the city*, London 1973; D. Harvey, What kind of geography for what kind of public policy? *Transactions of the Institute of British Geographers*, 63, 1974, pp. 18-24; R. Peet, ed., *Radical geography*. Alternative viewpoints on contemporary social issues, London 1977.

²⁹ S. Leszczycki, *Geografia jako nauka i wiedza stosowana* (Geography as a science and applied knowledge), Warszawa 1975.

³⁰ The first orientation is represented today by K. R. Popper, *The logic of scientific discovery*, London 1959; R. Braithwaite, *Scientific explanation*, Cambridge 1953; G. Bergman, *Philosophy* of science, Madison 1958; E. Nagel, *Structure of science*, New York 1961; C. G. Hempel, *Aspects* of scientific explanation, New York 1965; E. Nikitin, *Wyjaśnianie jako funkcja nauki* (Polish transl.) (Explanation as a function of science), Warszawa 1975; L. Nowak, *Wstep do idealizacyjnej teorii* nauki (Introduction to the idealizational theory of science), Warszawa 1977. The second orientation is represented by R. Wójcicki, *Topics in the formal methodology of empirical sciences*, Dordrecht 1979; A. Zinowjew, *Logika nauki* (Polish transl.) (The logic of science), Warszawa 1976.

³² R. Braithwaite, op. cit., 1953, p. 319; K. Ajdukiewicz, Logika pragmatyczna (Pragmatic logic), Warszawa 1965, p. 395; E. Nagel, op. cit., 1961.

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and epistemological — allows one to grasp the character of scientific explanation. 33

In contemporary methodology two variants of explanation have emerged: nomological and extranomological. Accordingly, two main standpoints as far as explanation in geography is concerned exist: nomological explanationism and extranomological explanationism.

The *nomological* aspect of explanation links it to scientific laws and has a uniform methodological standard. According to the nomological conception, the explanation of some fact amounts to proving that it is a case of some scientific law and the explanation of a regularity (scientific law) consists in deducing it from other more general scientific laws. ³⁴ In any case scientific explanation requires reference to scientific laws, whose cognitive character is the basic element determining the effectiveness or power of explanation.

The nomological conception expresses itself in different models of explanation: Hempel's deductive model, Nowak's idealizational model, and others.

The deductive model of explanation contains two elements: the explanans, i. e. sentences constituting scientific laws (and in the case of the explanation of facts also the initial conditions) by means of which one explains, and the explanandum, i. e. sentences stating facts or regularities which are being explained, as well as logical relations existing among them, such that the explanandum must be logically inferred from the explanans.³⁵

In such a variant explanation takes different forms and has different effectiveness depending on the character of 1) the explanandum, 2) the explanans, 3) logical relations existing between them.

The explanandum, which is the object of explanation, may comprise facts (events, processes) or scientific laws which show regularities.

The explanans contains scientific laws both in the case of the explanation of facts and of regularities. The explanation of facts requires, however, an additional determination of the so-called initial conditions, i. e. sentences about the realization of factual conditions contained in the named scientific laws. Scientific laws which are the basis for the explanation of facts can take

³⁴ According to C. G. Hempel (Explanation in science and in history, in: W. H. Dray, ed., *Philosophical analysis and history*, New York 1966, p. 97), this king of explanation "amounts to a deductive subsumption of the explanandum under principles which have the character of general laws: it answers the question 'Why did the explanandum-event occur?' by showing that the event resulted from the particular circumstances in $C_1, C_2, \ldots C_k$ in accordance with the laws $L_1, L_2, \ldots L_r$. This conception of explanation (...) has therefore been referred to as the covering law model, or as the deductive model, of explanation".

³⁵ The basic assumptions of the deductive model were formulated by K. R. Popper (*op. cit.*) and widened by C. G. Hempel (*op. cit.*, 1965; *Philosophy of natural science*, Englewood Cliffs 1966). Cf. also E. Mickiewicz, Spór wokół modeli wyjaśniania (The controversy around the models of explanation), *Studia Filozoficzne*, 3 (64), 1970, pp. 107-125.

on a different character. Special importance is attached to causal laws as these give necessary and sufficient conditions for certain events to occur, which gives them a high explanatory power. Noncausal laws, on the other hand (e. g. statistical, functional, developmental), have a lower explanatory power and their use is the object of methodological controversies.³⁶

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The explanation of regularities is provided through reference to other scientific laws which are more general, or more basic. This is connected with the construction of a theory as a system of logically related scientific laws.

Logical relations existing between the explanans and the explanandum are basically of deductive character.³⁷ However, in order to extend the range of explanation, in addition to deductive relations, inductive relations are also accepted when the fact which is being explained is not deducible from the explanans but only inductively justified with a smaller or greater degree of likelihood.

Considering the type of scientific laws (causal, statistical) and logical relations (deductive, inductive), different types of explanation are distinguished. As a principal standard, however, the so-called basic deductive-nomological model is accepted. The model is based on causal laws and deductive inference.³⁸

The idealizational model of explanation treats it as the realization of idealizational laws constituting the theory of the phenomena (events, processes) which are being explained.³⁹ Explanation understood in this way is thus based on laws of a specific type, i. e. idealizational laws arranged logically from the point of view of their generality and content in the form of a chain from a law to a phenomenon — which realizes them.

The standpoint of nomological explanationism assumes that scientific

³⁸ An original conception of the extension of the deductive model of explanation in the form of a model of univocal and historical explanation in the epistemological aspect is presented by J. Kmita *Szkice z teorii poznania naukowego* (Sketches on the theory of scientific cognition), Warszawa 1976, pp. 35-66.

³⁹ According to L. Nowak (op. cit., 1977, p. 94), "As the essence of a phenomenon which is ascertained in observation is given by the idealizational law, and its subsequent forms can only be given by its realizations, one can consequently explain... only with the help of a simple idealizational theory: the starting point for this is an idealizational law which subsequently undergoes realization". Cf. also L. Nowak, Pozytywistyczne koncepcje praw i wyjaśniania (Positivistic conceptions of laws and explanation), in: J. Kmita, ed., *Elementy marksistowskiej metodologii humanistyki* (Elements of the Marxist methodology of the humanities), Poznań 1973, p. 294. 20*

⁸³ Cf. M. Bunge, op. cit., 1967, p. 352.

³⁶ Cf. E. Nagel, op. cit., 1961.

³⁷ The problem of inferring the explanandum from the explanans is also controversial, e. g. the conception of inference is supported by J. Kmita, Z metodologicznych problemów interpretacji humanistycznej (On the methodological problems of humanistic interpretation), Warszawa 1971, p. 18, and it is criticised by Feyerabend, Jak być dobrym empirystą (How to be a good emiricist), Warszawa 1979, p. 64 and p. 78.

laws are an indispensable component of explanation.⁴⁰ In geography it exists in two variants: 1a) internalistic, 1b) externalistic.

In the *internalistic* variant nomological explanationism assumes that geographical knowledge contains scientific laws (or theories) which serve or which may serve as premises of the explanation of facts. The problem of the character of the peculiarity of scientific laws of geography naturally arises here. This problem is closely related to the problem of the methodological standard of a scientific law in geography, which is controversial and pertains to different conditions that statements constituting scientific laws should meet. We will not deal with this problem here and will limit ourselves to the problem of the peculiarity and individuality of scientific laws in geography.⁴¹

The problem of the peculiarity of scientific laws of geography, i. e. scientific laws being part of geographical knowledge, is also controversial. Two interpretations should be singled out here: referential and methodological.

In the referential interpretation the scientific laws of geography are laws which refer to a specific class of objects and/or properties being part of the domain of geography. According to the accepted conception of the referential specificity of geography the following types of scientific laws can be distinguished: 1) laws concerning "geographical" objects, e. g. geographical systems or geosystems, 2) laws concerning "geographical" properties or relations, e. g. the distribution or coexistence of different objects or their aggregates, 3) laws concerning "geographical" dependences, e. g. the interaction between natural phenomena and social and economic ones.

In the methodological interpretation, on the other hand, scientific laws of geography are defined through the investigative procedure of geographers or, more precisely, through the norms of this procedure, accepted or recognized by the community of scholars-geographers, irrespective of such or other referential assumptions.

The problem of the peculiarity of scientific laws of geography pertains to the level of reality to which these laws refer or to the character of variables which they contain. And here two interpretations are possible: reductionistic and antireductionistic.

In the reductionistic interpretation the scientific laws of geography (or theories) are certain specific physical (physico-chemical), biological, socioeconomic laws or their combinations (e. g. physico-social), or their factual realizations. Thus, scientific laws discovered by geography and being part of geographical knowledge as its integral components are natural or socioeconomic laws.

In the antireductionistic interpretation scientific laws of geography have an individual character usually connected with its referential specificity, which includes e. g. spatial relations.

In the *externalistic* version nomological explanationism amounts to the idea that the explanation of facts which are contained in geographical knowledge is based on scientific laws and theories borrowed from other sciences, namely physical, biological and socio-economic laws. In this formulation geography is only a consumer of these laws (and theories) using or adapting them to its purposes as it does not discover thom itself.

The extranomological variant of explanation does not have a uniform methodological standard and comprises those conceptions of explanation which do not refer to the scientific laws and logical relations that bind statements as far as generality is concerned. ⁴² These conceptions originated on the ground of and due to the opposition of the representatives of scientific disciplines (e. g. history, sociology) for which the nomological variant and especially the deductive-nomological model of explanation were too restrictive, and which have used a way of "explaining" that did not correspond to the nomological standard, thus risking the loss of their explanatory function and consequently their cognitive prestige. The criticism of the methodological bases of the nomological standard of explanation connected with logical empiricism had an important influence on the formulation of extranomological conceptions.

As the extranomological variant is connected with different philosophical disciplines and programmes, we shall limit ourselves to describing it as a standpoint of extranomological explanationism in geography.

The standpoint of *extranomological explanationism* assumes that explanation in geography can be carried out without the help of scientific laws and theories as deductive systems of sc entific laws. On the one hand, this standpoint is justified by the lack of scientific laws in geography or the uselessness of the laws of other disciplines to the explanation of facts that are contained in geographical knowledge and determined through geographical research. On the other hand, the extranomological standpoint originates from the anti-neopositivist opposition towards the scientistic conception of science and its methodological standard in geography.

The standpoint of extranomological explanationism in geography can be reconstructed in two variants: 2a) relationism, 2b) the conception of "understanding".

⁴⁰ The criticism of nomological explanationism in geography is presented by L. Guelke, Problems of scientific explanation in geography, *The Canadian Geographer*, 15, 1, 1971, pp. 38-53; cf. also A. M. Hay, Positivism in human geography: response to critics, in: D. T. Herbert, R. J. Johnston, eds., *Geography and the Urban Environment*, vol. II, Chichester 1979, pp. 1-26.

⁴¹ The problem of the character of scientific laws in geography is highly controversial and pertains to the degree of restrictiveness of conditions which are imposed on general statements as scientific laws.

⁴² Cf. J. L. Aronson, Explanations without laws, Journal of Philosophy, 17, 1969, pp. 541-577.

In the *relationist* variant the explanation of some event (state of affairs) consists in referring it to known events or in the determination of a relation that links it to a known event. ⁴³ Such relations are not considered from the point of view of their constancy and generality but from the point of view of the identification of a certain event in the class or set of known events.

One variant of relationism is explanation through the determination of an object or a state of affairs (event) as an element of a certain known real system. In this variant, which is called "a pattern model", "something is explained if it is so bound with other elements that together they make a uniform system." ⁴⁴ Explanation thus means inclusion of a certain object in a defined system.

Explanation understood in this way is widely accepted in geography, which concerns itself with the building and distribution of different objects of a high degree of complexity which constitute real systems. These systems are configurations of objects bound by real relations and separated from the environment surrounding them. The determination of their internal and external structure helps to identify different objects as their components and determine their occurrence, despite the unacquaintance with the laws of their formation.

The determination of the place of an object in the spatial structure of a system is a special case of this type of explanation in geography. This variant is justified by the conception of geography as a science about spatial relations and it has found its methodological expression in the so-called spatial analysis.

The relationist standpoint as regards explanation is treated as characteristic of the initial phase of the development of science. It also finds its justification on the ground of structuralism and functionalism.

Understanding (verstehen) is an equivalent, an alternative or a certain kind of explanation which has been established in the so-called "humanistic sociology". According to E. Mokrzycki, however, "none of the advocates of understanding took care to give a clear and possibly detailed characterization of this procedure." ⁴⁵ The notion of understanding is highly ambiguous and different in different contexts. Hence, it would be difficult to discuss this problem, even sketchily. ⁴⁶ We shall limit ourselves to giving three variants of understanding which are referred to in the methodological analysis in geography.

⁴³ Cf. R. W. Workman, What makes an explanation, *Philosophy of Science*, 31, 1964, pp. 241-254.

44 A. Kaplan, The conduct of inquiry, San Francisco 1964, p. 333.

⁴⁵ E. Mokrzycki, Założenia socjologii humanistycznej (The assumptions of the humanistic sociology), Warszawa 1971, p. 40.

⁴⁶ Cf. J. Topolski, Rozumienie historii (Understanding of history), Warszawa 1978, pp. 8-34.

The first classical variant comes from W. Dilthey and sees the peculiarity of understanding as a disclosure of the sense of human behaviour and creation. ⁴⁷ Here understanding means a certain cognitive method close to the interpretation of signs or sense of people's behaviour, different from explanation. In this variant understanding is an alternative of explanation for geographers who aim at the restructuring of geography on the ground of phenomenological and hermeneutic assumptions. This conception is, however, a methodological programme rather than a result of research.

The second variant of understanding pertains to the explanation of the rationality of human behaviour, which is different from the explanation of phenomena not pertaining to man. Understanding treated in this way is an explanation of rational activity through the reconstruction of its mental bases. ⁴⁸ This conception is proposed as an alternative to nomological explanation in geography. It takes the form of the programme of idealistic geography referring also to phenomenological assumptions. ⁴⁹

The third variant of understanding is close to the conception of notional relationism. According to M. Scriven, "understanding is approximately organized knowledge, i. e. knowledge about relations among different facts and/or laws. These relations are of different kinds — deductive, inductive, analogical etc." 50

The controversy between nomological and extranomological explanationism is a controversy concerning the preference of such investigative results which allow the realization of a specific conception of explanation. Nomological explanation assumes the development of scientific laws and empirical theories in geography; extranomological explanation assumes the development of cognitive description linked to the conception of a systemic approach to reality, and of evaluating theories.

This controversy has, however, a metamethodological aspect. Nomological explanation on the ground of the philosophy of science determines the criterion of the scientific character of a discipline and its maturity. Thus, it has an ennobling character. Extranomological explanation is an alternative whose realization leads to the restructuring of the methodological model of geography and geographical knowledge, mainly on the basis of the assumptions of hermeneutic and phenomenological philosophies. ⁵¹

⁴⁷ Cf. E. Mokrzycki, op. cit., 1971, p. 45 ff; cf. also S. Olczyk, Wyjaśnianie, rozumienie, interpretacja oznak (Explanation, understanding, interpretation of signs), *Studia Filozoficzne*, 3 (184), 1981, pp. 79-97.

⁴⁸ This conception is formulated by R. G. Collingwood, The idea of history, New York 1956.

⁴⁹ L. Guelke, An idealist alternative in human geography, Annals of the Association of American Geographers, 64, 2, 1974, pp. 193-202.

⁵⁰ M. Scriven, Explanation, prediction and laws, in: H. Feigl, G. Maxwell, eds, *Minnesota Studies in the Philosophy of Science*, vol. III, Minneapolis 1962, p. 225.

⁵¹ Cf. D. Gregory, Ideology, science and human geography, London 1978.

The analysis of methodological problems which I have discussed here, although, in my opinion, is essential, does not exhaust all methodological dilemmas of geography. These are issues such as: the problem of the level of reality which is of concern to geography, the character of coherence of geography, the character of the reference of geography, the criteria for the selection of investigative problems, the character of factors determining the development of geography, the role of valuation in geography, and others.

A presentation of these and other problems will allow a final settlement of views concerning the scientific character of geography and the determination of its methodological model or models.

Translator: Z. Nadstoga