

Supplementary Paper (from Foreword 2006):

From a general point of view, Geography deals with issues concerning the surface of the earth which are defined very differently with regard to their themes. This is apparent from the way in which the discipline is sub-divided, the wide variety of working groups as well as in any map. These issues affect, overlap and intertwine with one another in many ways. It is a chronological, hierarchical and spatial co-existence in which mankind and nature interact and initiate processes which alter their environments. Seen from this angle, the task of the geographer may be seen as making the complexity of this reality more transparent and showing how humanity has held its ground by continuous adaptation throughout the course of its cultural development.

Geography has become engrossed in this task by gradual stages. At its earliest stage (since around 1880) the subject of "regional geography" was concerned with regional units, i.e. it was directed towards understanding individual phenomena (according to WINDELBAND 1894, pp. 10 and RICKERT 1902, pp. 226), i.e. idiographically. General geography on the other hand was concerned with defining and explaining the forms observed in nature and landscapes cultivated by man, i.e. with determining the underlying laws, and was therefore nomothetically oriented.

At this time, general geography regarded itself as closely related to the natural sciences. The causal method of enquiry was used (von RICHTHOFEN 1903), not only in fields of physical and mathematical geography, but also in that of anthropogeography. The causal principle states that every cause has one or more effects and every effect one or more causes. According to this theory, the observation of materially definable forms is the fundamental factor in geography. Form represents effect in the interrelationship of cause and effect. By proceeding inductively from the effect, it is possible to determine the cause and transfer the result to other similar forms.

Geography has maintained its methodical position between the idiographic and the nomothetic approach, even if the assignment of the various fields of activity has shifted somewhat in the course of development. For example, regional geography as an idiographically orientated field of research has gradually become less predominant. In general geography, the nomothetic approach still dominates in physical geography (DIKAU 2005), whereas anthropogeography has presented a less uniform picture since around 1920:

The idiographic approach:

The idiographic method finds its application in historical geography. It is characterised by hermeneutic understanding. It is founded ultimately in the general act of perception by means of which mankind familiarises itself with the peculiarities of his environment. DILTHEY (1910/70, e.g. pp. 98, pp. 255) in particular made hermeneutics the determining method of enquiry in the humanities. Among other things, it governs the methods of dealing with texts, the evaluation of historical sources and archaeological findings. All that is known for certain must be corroborated by sources. The rest has to be fitted carefully together in such a way that an overall result is achieved which is as free of contradiction as possible. Enquiry can only proceed step by step, involving the whole network of arguments which may often be complex. The tighter the network, the more definite the final result will be, i.e. sources may have to be included in the process which are more remote from a spatial, material or chronological point of view. The interpretation to be preferred is the one which enables everything discovered about the object of enquiry to be fitted logically and accurately into the context.

This method requires background knowledge and sensitiveness and a large proportion of the argumentation consists of the enquirer's own reflections. In their conclusions, these are dependent to a great extent on their own environment and evolution (see below p. 8).

The nomothetic approach:

The idiographic approach stands in contrast to the natural-scientific explanation achieved by the nomothetic method of enquiry. It aims at the discovery and formulation of laws. From the outset, this approach is linked to certain methodic principles and methods, makes use of (for example) the language of mathematics and models, simulates processes etc.

Ever since its emergence between the two world wars, the methodic position of social geography has not always been entirely clear. In its early stages, both nomothetic (e.g. STEINMETZ 1913/35) and idiographic (e.g. van VUUREN, quoted by COOLS 1950) approaches can be observed. However, after World War II, the nomothetic approach soon predominated. Deterministic laws and models were first used or developed (e.g. CHRISTALLER 1933) in the so-called functional phase of geographic development (OVERBECK 1954). A close relationship with landscape science ('Landschaftskunde') is apparent (especially in BOBEK 1948). In consequence of the so-called quantitative revolution and the expansion of the statistical base in the 1950s, this phase gave way to another in which probabilistic and statistical methods were applied (e.g. GARRISON 1959/60; HÄGERSTRAND 1953/67). This in turn prepared the ground for applied social geography (and economic geography), even if this did not

achieve any importance in practice until the 1970s after the Geographers' Congress in Kiel. This development is also important to the extent that fundamental perspectives were shifted (BARTELS 1968; HARD 1973). Physical and anthropogeography separated. In social geography, human society itself became the object of research, with the behaviour of humans in social groups at its centre.

In the background, the system model is apparent. In it, the individuals as elements form the equal counterpart to the entities which are represented by social groups. These systems and elements are situated in the flow of information and energy ("flow-equilibrium systems") and are therefore open (BERTALANFFY 1950). They regulate themselves by backward coupling (WIENER 1948/68, pp. 124). Admittedly, social geography participated only superficially in this development, unlike the more ecologically oriented biogeography and the inorganic physical geography. In the field of anthropogeography, it is mainly economic geography that has to be mentioned in this context.

In general, it can be said that the nomothetic approach may yield a more solid foundation for further enquiry, although the nature of the explanation has changed over the course of time. From the positivistic point of view, it must be possible to verify theories according to certain fixed processes (POPPER 1934/89, pp. 7):

- 1) The theory must be examined by comparing the conclusions logically with one another to ensure that it is free of contradiction.
 - 2) The logical form of the theory must be examined to determine whether it has the character of an empirical scientific theory, e.g. that it is not tautological.
 - 3) It should be determined whether the theory being examined can be classified as a scientific advance compared to other theories.
 - 4) The theory should be tested by "empirical application" of the conclusions derived from it (verifiability).
- The theory must be formulated in such a way that its assertions may be disproved by experience (falsifiability, p. 15).

Constructivism and the discursive method in social geography:

In the 1980s and 1990s, the view became dominant in social geography that mankind itself represents the agent which shapes society from the bottom up, so to speak. Action-centred social geography became the focus of interest (especially WERLEN 1995-97). In this way the influence of positivism diminished and that of constructivism grew in importance (c.f. Wardenga, Gebhardt and Pohl, in: MÜLLER-MAHN and WARDENGA, publ., 2005).

Since the 1960s and 1970s, MATURANA and VARELA (1984/87) were developing their theory of autopoietic systems, explaining it using examples of living organisms. Unlike the flow-equilibrium systems,

the autopoietic systems not only regulate themselves, but also create themselves materially and spatially (see section 2.6).

Of particular interest for our reflections on this theory is the spatial relationship between interior and exterior. In contrast to the open flow-equilibrium systems, the authors saw the autopoietic systems as "structure-determined systems" which, as such, allow no "instructive" interactions. "... everything occurring in them occurs as a structural change which, at all times, is grounded in their structure, whether within the context of their own interior dynamism, or initiated (but not specified) through the circumstances of their own interactions" (MATURANA 1998, p. 322). This view gives rise to considerable epistemological consequences. He goes on to say "Nothing located outside a living system can determine what happens within this system, and since the observer is a living system, nothing located outside the observer can dictate anything within him or her, or what happens within him or her. It follows from this that the observer as a living system can make no essential assertions or declarations revealing or connoting anything independently of the operations by which he or she produces his or her assertions or declarations", and elsewhere (MATURANA and VARELA 1984/87, p.258) "*Everything* a person does - whether in seeing, tasting, selecting, refusing or speaking" - ... should be regarded "as a world which he has *produced* in coexistence with other persons (italics as in the original).

This position of "radical constructivism" stands or falls with the assumption of an enclosed cognitive cycle in the system of the organism (MATURANA and VARELA 1984/87, p. 260). As yet however, this has never been verified or demonstrated. On the contrary, the autopoietic system also seems to be an open system, i.e. that information (as in the flow and non-equilibrium system or the hierarchic system, see sections 2.3, 2.4, 2.5) can also penetrate from outside and decisively affect the way in which the system shapes itself materially and spatially (see section 2.6). The fact that we can conceive of reality as such as existing independently of ourselves and are therefore able to explore it, would make this understandable.

Besides this, it is becoming increasingly doubtful whether constructivism in its radical form represents a methodically relevant basis. A number of variants now exist which permit the existence of a reality outside the observer (a compilation of quotations and references appears in BEATS BIBLIONETZ 2005). However, it should be remembered that, thanks to the "filter" of our own intentions and ways of life, this cannot take place directly as POPPER (1987, p. 29) thought, but only with certain restrictions, so that we always find "exactly the right blend of regularity and variability, that mixture of stability and volatility which is so typical of human experience when we examine it more closely" (MATURANA and VARELA 1984/87, p. 259).

It seems to me that the current methodical discussion in social geography reflects this situation to a certain extent. A number of different theories, ideas and opinions co-exist freely alongside one another. These may have been developed with the assistance of the hermeneutic method or they may have evolved spontaneously or be based on well-known theories from other fields of endeavour (e.g. "Structuring theory" by Giddens or "System theory" by Luhmann; GIDDENS 1984/88 or LUHMANN 1984; "Theory import": SCHMIDT 2004). From a methodological point of view, a post modern climate seems to exist where "anything goes" (FEYERABEND 1975/86, pp. 21).

The individual theories are discussed, exchanged and scrutinised within groups of experts in various fields. This means that communication, i.e. language, plays an important role. However, from a technical point of view, language should not be seen purely as a means of conveying information, as WITTGENSTEIN stated in his early "Tractatus" (1922-1953/1990). Instead, it should be remembered that it is formed by the speakers as individuals to suit their own purposes. With this in mind, Wittgenstein later developed a theory of "linguistic play" in his "Philosophical Studies", where each "linguistic play" forms a functional unit which, as such, represents a way of life. This means that every thought and every idea is tied to the way in which the speaker thinks. This effectively nullifies the "idea of a transcendental subjectivity as the ultimate manifestation of ground" (GADAMER 1960/90, II, pp. 428).

This interferes with understanding in the "communication community". In order to achieve a consensus which is acceptable to all, certain rules should be observed (HABERMAS et al. 1981, particularly I, pp. 25).

- All those involved should have the same rights - a requirement which is seldom fulfilled as experience shows. Instead, an internal hierarchy develops (as is typical for small groups) in which certain members dominate. Discussion can then quickly become a power game. For this reason, APEL (1992, pp. 44) would welcome discussion which is "free of dominance and power", but admits that this would be impossible to realise.

- It should be agreed that the best arguments will be accepted. But here too, problems arise because understanding something or someone else is not possible without the willingness to exercise self-criticism. One has to listen, thereby accepting the possibility that one's own perception of the truth may be called into question (GADAMER 1960/90, II, p. 116). This delays the acceptance of innovative ideas.

- Another rule states that participants should only act cooperatively and be committed to achieving a consensus, e.g. in order to avoid conflicts of interest brought in from outside. This too is difficult. FOUCAULT (1973/81, p. 42) rightly asks "why has a certain statement come to the fore and not another instead?" He was unable to give an answer. "If every discussion has an outside, if its principles are subject to conditions, which may change but are

neither ultimately self-evident nor assertable, there can be no overriding instance which might be able to settle a conflict between discussions" (WALDENFELS 1990, p. 201).

Discussion should produce a result, even if it is accepted only by a majority of the participants. But what does "majority" mean in the context of scientific discussion? According to Pierce (quoted by APEL 1990, p. 115) it may lead to a "truth" as the regulative idea of a self-correcting process of research, thereby defining further procedure. Does such a truth offer a reliable base? There is no doubt that discussion is able to create a climate in which many good ideas may thrive, a fact whose importance should not be underestimated, as many pioneering impulses in social geography show (summarised e.g. by PEET 1998; HUBBARD, KITCHIN, BARTLEY and FULLER 2002). Discussion may then be of considerable heuristic value. Of greater importance however, is how close it brings the participants to the object (with regard to method and content) for the examination of which the discussion was initiated. In this context, majorities are of no importance, even if they create a feeling of confidence on the part of the participants.

In a society where diversity is constantly increasing, there is a growing demand for scientific precision, even with regard to theoretical statement. After all, there should be a process of mutual fertilisation between theory and practice in research. A change in our thinking therefore seems to be required. In our striving to understand complex reality, we should return to the natural-scientific perspective as our starting point. As we have shown above, such a change would be nothing unusual in our subject. [We see no foundation in the claim that "geography in its historical essence is a hermeneutic science" (Pohl, in MÜLLER-MAHN and WERDENG, publ., 2005, p. 15). See also section 2.4.2.1 above.]

The theory of complexity:

In the 1970s the Chaos Theory and Synergetics (HAKEN 1977/83) developed in the natural sciences, primarily in physics and chemistry. They describe the behaviour of non-linear systems whose parts (elements) obey their own deterministic laws, while the behaviour of the entities is unpredictable. A "deterministic chaos" is created, in which the elements join to create patterns. Anthropogeography took no part in this discussion, mainly because the spatial patterns discovered there appear to be of less importance in society or can be explained by other means. Perhaps this shows that the exact sciences deal with orders of magnitude in which the behaviour of the elements can be demonstrated only with the aid of complex apparatus, and that many of its phenomena can be described mathematically but explained only with great difficulty (if at all).

The development of research however continued and the study of chaos gave way to research into complexity. Increasingly refined methods were used to determine how diversified parts (elements) interact and react with one another, especially since the behaviour of these parts differs from that of the whole. This finds its expression in spatial and chronological self-organisation and emergence. The highly ambitious aim is to trace highly complex phenomena such as language, life and society, using, among others simulations. Like the System Theory, the Theory of Complexity is one of the great fundamental interdisciplinary theories. Many educational institutes in the USA (e.g. the Santa Fe Institute in New Mexico and the New England Complex Systems Institute in Cambridge, Mass.) are devoted to research in this field.

However, all attempts (on the part of physics, chemistry, biology and, subsequently, sociology) to deal with the problem of complexity have produced only a number of theories and approaches (e.g. BAR-YAM 2003) without doing justice to the central problem. Although the complex structuring of order is ubiquitous in the most diverse realms of being (characterised by processes, hierarchies and spatial differentiation) it has not yet been possible to represent this or explain its working in one unified theory. It seems that, here too, these disciplines have reached the limits set by their media and methods of enquiry.

This is where the Process Theory comes in. It links the seemingly anarchic behaviour of the elements with the laws characterising things in general, i.e. it links "from the bottom up" with "from the top down". To do this, it proceeds inductively, i.e. the path of enquiry leads from material observations step by step to more abstract levels by a process of reduction. This procedure also contains hermeneutic and phenomenological processes. At the most abstract level, that of the flow of information and energy, it is possible to formulate laws.

The examples are taken, for the most part, from geographical literature. Because of its development with regard to method and content, Geography is entitled and able, more than any other discipline, to make an important contribution to solving this problem. The order of magnitude most suitable for geography is the mesocosmos (VOLLMER 1985-86, I, pp.57), i.e. the world of our day-to-day experience. Mankind as a society is the medium of enquiry preferred by us. As participants, we are able to observe and understand its phenomena. In particular, it is the thematic division of society and its manifestation in institutions which favour us because they make the qualitative affinity clearer and the determination of the position of processes and systems easier. In this way, it becomes possible to gain insights into the intricate structure of processes. In this case, the wide variety of objects studied by geography proves to be an advantage.

Conversely, the interdisciplinary preoccupation with the subject of complexity may even provide stimuli for geography itself, which defines itself principally as a spatial science. Because, as this theoretical enquiry shows, space is ultimately formed through self-organisation and emergence, i.e. space cannot be understood without a knowledge of the structure and development of its material content. It seems to me that new and interesting tasks await our subject.