THE DYNAMICS OF SOCIAL AND CULTURAL CHANGE

R. Vanderstraeten
Faculty of Social Sciences, Utrecht University, the Netherlands

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Summary

Seen from a macro-dynamic point of view, the birth of modern society can be situated in the second half of the eighteenth century. To describe the basic characteristics of modern society, two levels should be distinguished, viz. the structural and the cultural level. According to the late Talcott Parsons, the dominant value pattern of modern society is the cultural pattern of instrumental activism. What is valued in modern society is not passive adjustment to the exigencies of the environment, but increasing the freedom of action within the environment and ultimately control over the environment. It is no longer adaptation to the environment, but adaptation of the environment to social needs. On the structural level, new patterns of societal differentiation emerged. According to Niklas Luhmann, the pattern which characterizes modern society is one of functional differentiation. Functional subsystems impose their particular perspective on the world. The environment is perceived through different lenses (e.g. through a political, legal, economic, educational, or scientific lens). These different perceptions are incommensurable. As a consequence, society cannot control its overall impact on the environment. Its structural and cultural characteristics limit its sensitivity vis-à-vis the environment. Awareness of these limitations is necessary when promoting sustainable development.

1. Introduction

We have become increasingly aware of the fact that our contemporary society not only changes the environment, but that it also undermines the conditions of its own

existence. The changes which society brings about in the environment hit back on social life and endanger our contemporary society. For sure, this is not an entirely new problem. Similar phenomena also occurred in earlier phases of social evolution; for example, deforestation or exploitation and depletion of fertile soil by semi-sedentary tribes. But the intensity and the scale with which the ecological problems nowadays impose themselves make it impossible to ignore them any longer. Judged from the rise of interest in ecological issues (e.g. in the mass media, in the new social movements), our society is currently alarming itself. Appropriate action is urgently requested; apparently we have not much time left. In this context, specific contributions of science are expected. But what has science, and what have the social sciences in particular, to offer in this regard? Have they developed the theories, and the conceptual tools and instruments necessary to describe, understand, predict, explain and/or resolve environmental problems?

It is not difficult to see that the social sciences cannot fall back on an established record of knowledge about the ecological conditions of society. The social sciences are traditionally characterized by an *intra-unit orientation*. They focus on internal points of view, that is, on phenomena and relationships that are situated within society and that do not refer to society's environment (e.g. ideological convictions about the foundations of the good society). This emphasis can, in part, be explained by the historical conditions of the emergence of the social sciences. From the onset, the social sciences needed to establish themselves in opposition to the already well-established natural sciences. The distinction between both types of science was seen in terms of a repartition of the 'objective' territory. The study of nature was left in the care of the natural sciences; natural objects were not the territory of the social sciences. These social sciences instead tried to focus on 'social facts' (as Emile Durkheim put it) or on 'social action' (in Max Weber's sense). Foremost, the founding fathers of the social sciences included intra-social relationships within the boundaries of the new discipline.

This repartition of the territory of 'objects' tends to carry on the distinction between nature and civilization (or culture), that emerged in Europe in the course of the eighteenth century. As will be argued, this particular opposition entails consequences that are of great importance in the context of our theme. The contrasting of nature and culture has, on the one hand, led to an instrumental attitude towards nature. Nature was defined as something that needed to be disciplined by culture, or that had to made fertile in the light of human needs. On the other hand, nature was almost disregarded within the cultural or social sciences. This neglect is even apparent in the so-called 'critical' social theory, which still has a lot of adherents (even among members of the new social movements). Although it criticizes the consumerism of the 'one dimensional man' (Herbert Marcuse), critical theory furthermore focuses on intra-social phenomena. It evaluates society in terms of the well-known human (i.e. bourgeois) ideals of freedom, rationality, or equality. It does not offer a critical assessment in the light of uncertain prospects or fears. But how can the ecological conditions of our society be perceived? What kind of theoretical perspective is needed to be able to observe the relationship between society and its environment?

Against this background, it can be argued that both the social sciences and society itself might benefit from a systems-theoretical perspective, that emphasizes the distinction

between a system and the environment. Since the pioneering work of Ludwig von Bertalanffy, modern systems theory particularly focuses on the interrelationship between the system and its environment. This systems-theoretical perspective, however, has hardly been influential within the social sciences. That it is able to provide a strong, alternative perspective within the social sciences has neither been clear. Regrettably, systems theory has been used to underpin a technological, instrumental attitude towards the environment. It was also used to study internal relationships within society, e.g. between an organization and its social environment (customers, governmental bodies, state legislation), or between the political system and its social context. Nevertheless, this systems approach enables to give due attention to society's extra-social environment. One needs to focus on the *difference* between society and its environment and on the *unity* of this difference.

In this article, the possibilities and limits of this approach cannot be abundantly illustrated. The following sections provide a tentative discussion of some crucial issues. The next part briefly describes some important developments within systems theory and cybernetics, that provide the foundations of an alternative theoretical view on ecological issues. The focus is on theories about self-organization and autopoiesis that have been developed in the second part of the twentieth century. In the second part of this article, this theoretical framework will be used to describe and explain how our modern society handles ecological problems. While focussing on the works of Talcott Parsons on culture and of Niklas Luhmann on social structure, society's awareness of the changes it brings about in its environment will be discussed. In the conclusion, directions towards a more rational handling of the interrelationship between society and its environment will be indicated. Overall, this article focuses on the dynamics of macroscopic changes within modern society.

2. Systems Theory

As this part of the encyclopedia is particularly concerned with the clarification of epistemological questions, the starting point of the following analysis is a reflection upon the specific details of new scientific approaches to the study of system/environment relationships. First, a brief overview of paradigm shifts in the field of general systems theory is presented. A distinction is made between three paradigms. This distinction focuses on the theoretical treatment and interpretation of system/environment relationships. In the course of these 'scientific revolutions', the autonomous nature and closure of systems is increasingly emphasized. Second, implications for a theory of social systems are discussed. It is indicated that the relevance of environments cannot be reduced to that of an encompassing super-system or of a series of environing systems with which interrelationships are established. The environment is the horizon of the system; it also contains *the chance* to seek or avoid relations with other systems. In the third section of this part, the epistemological consequences of this approach are outlined in terms of social constructivism. Social systems construct their environmental problems; what they perceive is dependent upon how they organize their perception. It is argued that knowledge of the conditions of our current ways of perceiving (or *not* perceiving) the environment will enable us to consider and institutionalize alternative points of view, that are more sensible to environmental problems.

2.1. 'Paradigm Change' in Systems Theory

As already briefly mentioned, modern systems theory has been strongly influenced by the work of Ludwig von Bertalanffy. His *General System Theory*, which originated in the period around the Second World War, is still influential in a number of research fields. Undoubtedly the best-known and most influential distinction, discussed by von Bertalanffy, is that between *closed* and *open systems*. Closed systems are, so to speak, self-satisfied systems. They do not interact with their environment. They do not have contact with elements that do not belong to the system itself (e.g. a clock). The maintenance of open systems, on the contrary, depends upon the continuous exchange of elements between these systems and their environment. The boundary of open systems is permeable. The behavior of complex, open systems is described as the result of an interaction between a system and its environment. In fact, a system's openness is seen to be both the basic condition *and* the basic problem of its existence. Because it can never entirely control its chaotic environment, it has to adapt to its environment. Therefore, this approach accords the primacy to the environment. Divergence between a system and its environment indicates a 'crisis' of the system; structural change within a system is interpreted as a functional, adaptive reaction to the environment.

Already in the early-sixties, the guiding principles of this kind of systems analysis were criticized, in particular by researchers working in the field of cybernetics. This field (which developed in part as a spin-off of 'General System Theory') focused on purposeful behavior, and incorporated the concepts of feedback and feedback control. According to this perspective, systems are able to act purposefully within a chaotic and threatening environment if they can process information about the results of their own actions as part of the information on which they continue to act. Using feedback control, systems are able to maintain their proper identity, to realize their own goals and/or to change themselves, notwithstanding the active exchange of matter with their environment. Systems are - as the cyberneticians claimed - self-referential, *self-organizing systems*. As a consequence, structural changes do not have to be understood as functional, adaptive reactions to the environment. System dynamics does not have to be attributed to external causes, but to internal efforts.

This circular feedback thinking of cybernetics is able to explain the maintenance of the structural characteristics of systems, but it is unable to provide an account of all the operations of a system. Defined in terms of self-organization, the meaning of the concept of self-reference remains restricted. Meanwhile, however, new developments within systems theory have made it possible to give this concept a more encompassing meaning. In this new 'paradigm', the concept of 'autopoiesis' is crucial (Maturana and Varela, 1980). *Autopoietic systems* are systems that produce the elements out of which they exist by means of a network of these elements themselves. To illustrate this tautological definition, an example may be helpful. The cell of an organic system is a complex production system, producing and synthesizing macromolecules of proteins, lipids, and enzymes, among others; it consists of about 10^5 macromolecules on the average. The entire macromolecular population of a given cell is renewed about 10^4 times during its lifetime. Throughout this staggering turnover of matter, the cell maintains its distinctiveness, cohesiveness, and relative autonomy. It produces myriads of components, yet it does not produce only something else - it produces itself. A cell maintains its

identity and distinctiveness during its life span. The maintenance of unity and wholeness, while the components themselves are being continuously or periodically disassembled and rebuilt, created and decimated, produced and consumed, is called 'autopoiesis'.

Autopoietic systems are, thus, self-referentially closed systems. They recursively produce the elements out of which they exist by the elements out of which they exist. Living systems do not import 'life' from their environment, but need to produce their own 'being alive'. This does not imply that autopoietic systems are windowless 'monads' (Leibniz). It means that autopoietic systems use the environment according to their own standards. External factors do not directly interfere with the functioning of a system; they need to be 'translated' into internal elements. The environment resonates in the system by means of the elements which the system itself produces. In this regard, one might also speak of 'order from noise', or of 'order out of chaos'. By implication, von Bertalanffy's distinction between open and closed system needs to be surpassed. Autopoietic systems are at the same time open and closed systems. Or, to put it more precise: *they can be open, because they are closed. The primary distinction within systems theory is that between system and environment*.

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Biographical Sketch

Raf Vanderstraeten (1966) presently teaches at the Faculty of Social Sciences of Utrecht University (the Netherlands). Previously, he worked at the University of Leuven (Belgium). He has also been a Visiting Fellow at the University of Bielefeld (Germany).