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The Logic of Observation: An Introduction to Constructivism

1. FROM "WHAT IS CONSTRUCTIVISM?" TO "WHAT CAN BE CALLED CONSTRUCTIVISM?"

Anyone who tries to define constructivism (or even radical constructivism), or to criticize constructivism as such (cf. Nüse *et al.*) very quickly faces a dilemma. It is obvious that (radical) constructivism is not a homogeneous theory. Nor was it developed by a homogeneous community of scholars, who agree on a common terminology. Instead, what is labeled "constructivism" in philosophy and in various fields of research (ranging from biology and family therapy to literary studies) is a complex discourse created by many voices coming from various sources (cf. Schmidt 1987, 1992). Also, we have to remember that "constructivism" is an observational concept. Many authors who have been classified as constructivists by critics or companions in fact reject the label; others — such as H.R. Maturana — never called themselves constructivists although especially his ideas have strongly influenced the discourse called "radical constructivism."

P. Janich has rightly reminded us that categorizing scholars in schools or movements is always a simplification: each scholar has his or her own mind and undergoes a life-long intellectual evolution (4). The confusion concerning constructivism is heightened by the fact that many "constructivisms" appear on the academic stage; there are, for instance, "social constructivism," "cognitive constructivism," "empirical constructivism," "Erlangen constructivism," "radical constructivism," and so on — let alone several constructivisms in the history of modern art, as well as mathematical constructivism (cf. Knorr-Cetina, Schmidt 1992). So what could or should we appropriately call "constructivism," and for what reasons?

A short glance at the list of the prominent subjects in constructivist discourses might provide a way out. Among these topics are: system and environment, observation and distinction, self-organization and self-reference, autonomy and regulation, organizational closure and structural determination. These topics refer to the multifarious roots of constructivist thinking in the past, including empirical theories of cognition (Maturana 1985, Roth 1992); Glasersfeld's radical constructivism based on Piaget's developmental

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psychology (1987); systems theory in biology and sociology (Hejl 1982, 1987); G. Günther's polycontextual logic (1976ff.) and G. Spencer Brown's logic of distinction (1972) which have recently been re-introduced into constructivist discourses by Luhmann (1985, 1990, 1990a).

Generally speaking, four main ways of characterizing the basic constructivist hypotheses may be discerned, at least as far as I can see: neuro-biological approaches following H.R. Maturana, F.J. Varela, and G. Roth; cybernetic approaches oriented towards H. von Foerster's work; socio-philosophical approaches influenced by N. Luhmann's writings; and psycho-philosophical approaches resulting from a novel reading of philosophical and psychological traditions (E. von Glasersfeld).

These approaches converge in one essential methodological maxim: all scholars should convert "what" questions into "how" questions. Here is why. We live in a world that is essentially defined by our cognitive and social activities, and so it seems reasonable to start with these activities and their complex conditions or presuppositions instead of trying to find a basis in objects or even in "nature," taken to be entities given in advance. This advice might perhaps be condensed into two slogans: "from objects to operations!" and "from identities to differences!" With these slogans constructivists react to a consequential decision with which European epistemology began some two thousand years ago. As S. Ceccato has shown, Greek epistemological discourse began with an unreflecting and disastrous initial operation. Philosophers such as Empedocles, Lycippus, and later on Plato, introduced the notion of (an active) perception, thus relating two components which implicitly were taken as givens: subject and object, observer and observed. Nobody realized at the time that the difference between subject and object, observer and observed is a difference produced by us, and that these notions are in a way already related to each other by our activity of distinguishing them. Consequently, establishing an explicit relation between the two by means of the newly introduced activity called perception evoked the idea that this should be an original activity which cannot be bypassed in any manner (cf. Zitterbarth).

Many critics, questioning the novelty of constructivist ideas, as well as so-called constructivists themselves — above all von Glasersfeld — have pointed to the fact that the importance of the role individuals and society play in the process of constituting reality has been acknowledged since the beginning of Greek philosophy. The respective gallery of ancestral portraits of allegedly constructivist philosophers comprises, among others, Democritus and Sextus Empiricus as well as Vico, Berkeley, Kant, Nietzsche, Vaihinger, Popper, Goodman, and Rorty. Other predecessors are detected in Gestalt psychology (W. Köhler, W. Metzger), social and developmental psychology (J. Piaget), attribution theory (G. Kelly) and P.L. Berger's and Th. Luckmann's bestseller *The Social Construction of Reality* (1966). Nor should we forget the contribution of media- and communication theories (cf. S. Weischenberg 1990). However, what matters more with respect to a proper evaluation of constructivism is not the identification of its ancestry, but an answer to the question whether or not, in a foreseeable future, the many-voiced interdisciplinary discourse of constructivism can be properly systematized, backed by empirical findings, and applied to solving philosophical as well as scientific and social problems. Moreover, I would recommend that intellectual historians check very carefully whether alleged precursors have argued in a constructivist manner themselves or whether sceptical argumentations in the history of thought are nowadays readable as constructivist in the light of constructivism(s).

2. REALITY AND OBSERVATION

No other problem has intrigued European philosophical thinking as intensely as the relation between being and consciousness and the search for true or objective knowledge. Since Democritus, philosophers who have called in question the objectivity of human knowledge have concentrated their argumentation on the subject and his/her active perception, which cannot be by-passed when we talk about reality, knowledge, and truth. Democritus admonishes philosophers that we can never compare perceived objects to unperceived ones because we live in a world of perceptions where only perception can be related to perception. Kant has redefined this sceptical argument in his transcendental epistemology, claiming that "the objects, we perceive, are not in themselves what we regard them to be ... and, as appearances, they do not exist in themselves but exclusively in us."[1] In this tradition the argument concentrates on the subject and his or her cognitive activities. The same argumentative strategy still governs today's constructivist epistemological discourse. E. von Glasersfeld, for example, claims that whatever is constructed as real "quite evidently is nothing else but the experiential worlds of subjects"[2] (1985, 21).

It is generally admitted by critics of constructivist epistemologies that this argument in fact de-ontologizes "the world" by decomposing it into worlds as experienced by each individual according to his/her conditions of perception. Nevertheless, von Glasersfeld's radical constructivism inherits basic problems of European philosophies of subjectivity, beginning with the

1 "... daß die Dinge, die wir anschauen, nicht das an sich selbst sind, wofür wir sie anschauen ... und als Erscheinungen nicht an sich selbst, sondern nur in uns existieren können" (*Kritik der reinen Vernunft* B 59).

2 "... ist offensichtlich nie mehr als die Erlebniswelt des einzelnen Subjekts" (1985, 21).

need to objectify human consciousness as the center of the world, which preserves the traditional distinction between subject and object — but in a weaker form (Nassehi 3).

Recently, Luhmann has strongly rejected this argument. He adopts a different strategy in an effort to transform Glasersfeld's radical constructivism into a constructivism which, in his eyes, really deserves the name. Luhmann blames radical constructivists for still — intuitively — presupposing that only human individuals — who else? — construct realities. Luhmann postpones an identification of observing agents, beginning instead with operations, i.e. with the operation of observation/observing. His argument in this regard closely follows G. Spencer Brown, who characterizes perception and knowledge as the introduction and post-processing of distinctions in a previously unmarked space. Drawing a distinction, i.e. marking a difference, prepares the designation of this distinction, which in turn only makes sense in a framework or a system of distinctions. The distinction one begins with is a basic operation that cannot be wiped out later on, which introduces a fundamental asymmetry. From now on we have to observe either this or the other side of the distinction, continue our operations either here or there or apply the distinction to itself (a so-called re-entry of a distinction into the system).

Each observation operates with a so-called blind spot. The distinction we apply cannot be observed in the very same observational process and at the same time. Of course it can be observed, legitimated or even rationalized afterwards in terms of a second-order observation — at the expense of another blind spot of course, viz. the blind spot the second-order observer implicitly makes use of, and so on.

Drawing a distinction depends on observations. Distinctions are contingent, since the environment does not contain distinctions: the environment is like it is (von Foerster 1985, 93).[3] The unity of observation(s) exists only in the observing system. Accordingly, perception and cognition do not provide us with objective representations of the environment *as such*. They are completely system-dependent constructions which change when other distinctions are applied.

It is very important to emphasize that distinctions are not drawn arbitrarily. Observing systems are determined by the evolution of their species and by experience, knowledge, norms, communications, etc. which shape any observation in terms of criteria or boundaries of contingencies. Constructive distinctions do not prove their value by means of some kind of immediate comparison with the environment. Instead, each observing system recursively controls its reality constructs by observing its own observations

3 "Die Umwelt enthält keine Information. Die Umwelt ist wie sie ist" (1985, 93).

or by observing other observers with regard to the consistency, acceptability or connectivity of the respective constructs. This argument underlies Luhmann's proposal to begin espistemological considerations with observations and not with observers, thus pointing to the fact that attributing observations to specific observing systems requires other distinctions connected to another set of presuppositions. According to Luhmann, not only living systems are able/apt to observe (= draw and designate distinctions) but also social systems (= networks of communications). In other words, he begins his argument solely with a difference (system/environment) which is not ontologically interpreted as a dissection of "the" one reality into parts, but is exclusively regarded as the result of distinctions which a system has drawn in a specific context.

> Accordingly, there is no ontological world which could be objectified without systems. Systems can only observe what other systems observe. The ontological theory of reality must be replaced by a theory of second-order observation, or, to follow Heinz von Foerster's formulation, by a 'second order cybernetics'."[4] (1986, 50. S.J. Schmidt, trans.)

According to Luhmann, cognition is made possible by a system's self-constituted, system-dependent processing of the distinction between system and environment, and by nothing else. "Each self-referential system disposes of exactly that kind of contact with the environment which the system itself makes possible; it has no environment *as such*" (1985, 146. S.J. Schmidt, trans.).[5] The unity of a system is constituted via self-referentiality, i.e. by observing and processing the difference between system and environment. Accordingly, Luhmann defines the notion of observation — on a rather abstract level — in terms of processing distinctions without linking observation to cognition alone (1985, 63). Self-observation emerges by introducing the system/environment-distinction into the system which constitutes itself via this distinction. Whatever appears as a unit or as an element is constituted by a system that makes use of an element as a point of reference for establishing relations.

Constructivist thinkers consensually hold the view that reality results from constructive operations of observing systems. Luhmann transforms this

4 "Es gibt danach keine systemfrei objektivierbare, keine ontologische Welt. Erreichbar ist nur, daß ein System beobachtet, was ein anderes System beobachtet. Die ontologische Welt-Theorie muß durch eine Theorie der Beobachtung zweiter Ordnung oder, um mit Heinz von Foerster zu formulieren, durch eine 'second order cybernetics' ersetzt werden" (1985, 50).

5 "Jedes selbstreferentielle System hat nur den Umweltkontakt, den es sich selbst ermöglicht, und keine Umwelt 'an sich'" (1985, 146).

hypothesis into the more general thesis that there is no ontological reality which can be objectified independent of systems. He concludes instead that there must be as many realities as there are observing systems. Luhmann continuously repeats that in the environment there are no correlates for the distinctions, observations and designations a system makes use of. Luhmann is very special in that he does not at all contest the reality of an outer world. Instead, he emphasizes that observing and distinguishing are system-dependent operations which import neither reality nor information into a system. Nevertheless there cannot be any doubt that the outer world exists, and that a real contact with this outside world is possible as a condition of the reality of a system's operations (1990a, 40). Cognizing systems, according to Luhmann, are real, observable systems inside a real world, without which they could neither exist nor recognize anything. What matters, from an epistemological point of view, is that this world is cognitively inaccessible (1990a, 41) to cognizing systems which by necessity live (in) their worlds of experience whose relations to "the real world/reality" are unobservable.

In his reply to critics of constructivism who contest its innovative power, Luhmann has epitomized the quarrel very clearly:

> If constructivism declared nothing else but the inaccessibility of the outer world *as such* and the self-containedness of cognition, without falling prey to the old (sceptical or solipsistic) doubt whether or not an outer world exists, it would present no innovative insights at all.[6] (1990a, 33. S.J. Schmidt, trans.)

What is new in constructivism is the form of constructive theories of a self-referential, operationally closed perception and cognition. Constructivist theories begin with a system/environment-distinction, with operational closure and self-referentiality. And these initial hypotheses are more and more backed by empirical research showing that only closed systems can perceive and know.

3. REALITY AND OBSERVER

In the previous section I concentrated on the problem of observation. In what follows I shall concentrate on human observers and their theoretical characterization. The hypothesis I shall advocate runs as follows: human observers, theoretically modelled as cognizing systems, can only observe and produce knowledge because they are operationally closed and separated from

6 "Soweit der Konstruktivismus nichts anderes behauptet als die Unzugänglichkeit der Außenwelt 'an sich' und das Eingeschlossensein des Erkennens, ohne damit dem alten (skeptischen oder 'solipsistischen') Zweifel zu verfallen, ob es eine Außenwelt überhaupt gibt — insoweit bringt er nichts neues" (1990, 33).

their environment. The emphasis here is on operational closure, since it is of course acknowledged that living systems must import food and energy from their environment in order to survive. This hypothesis is backed by empirical research; for example, there are the results of neuro-biologists presented by G. Roth and H. Schwegler.

In the past brain researchers favoured the so-called filter theory which assumed that neuronal filters, from the sensory periphery to the highest centers of perception, become more and more specific and selective. Today a model is preferred according to which stimulations of the brain are processed in parallel, distributed neuronal networks. Complex perceptual data are not represented by small neuronal units or even by single neurons, but by simultaneous activities of many neuronal cells or cell-combinations which are distributed throughout the brain. This model allows for interesting insights into the constructive character of perception. In the active process of perception, the brain and sensory organs "rummage through" the environment for stimuli which — according to previous experiences and expectations — are important for the cognizing system. Roth and Schwegler state,

> For the brain as well as for the sensory organs, as part of the world, it is impossible ... or even inappropriate to copy the world "as it really is." Instead, cognitive systems aim at gathering knowledge of the world which serves the purpose of survival (or at least serves the purposes of perceived interests). This distinction does not, of course, exist in the environment, which has rather different kinds of importance for different systems. The distinction must instead be constituted by the cognitive systems themselves. Criteria concerning what is important or not stem from the system itself, even if they have been acquired through individual learning or in the course of evolution via interaction with the environment. This is the basic self-referentiality of the brain and of the cognitive system.[7] (1991, 3. S.J. Schmidt, trans.)

According to Roth and Schwegler, the human brain is not born equipped with a "complete cognitive world." Instead neuronal states of excitement

7 "Es ist für das Gehirn und die Sinnesorgane als Teil der Welt sowohl im Prinzip unmöglich ... als auch unzweckmäßig, die Welt abzubilden, 'so wie sie wirklich ist.' Vielmehr ist es das Ziel des kognitiven Systems, Kenntnis über die Welt zu gewinnen, die für ein überlebensförderndes (oder zumindest einem aktuellen Interesse dienendes) Handeln ausreicht. Es muß daher Bedeutungshaftes von Unbedeutendem unterscheiden. Diese Unterscheidung existiert natürlich nicht in der Umwelt, die ja für verschiedene kognitive Systeme ganz verschieden bedeutungshaft ist, sondern muß durch das kognitive System selbst getroffen werden. Die Kriterien für Bedeutungshaftes entstammen vielmehr stets dem System selbst, auch wenn sie bei individuellem Lernen oder im Laufe der Evolution in Auseinandersetzung mit der Umwelt gewonnen wurden. Dies ist die grundsätzliche Selbstreferentialität des Gehirns bzw. des kognitiven Systems" (1991, 3).

gradually differentiate themselves in a self-organizing and self-referential way, giving rise to the cognitive diversity which is also consciously experienced later on. In the first years of one's life, neuronal states of excitement are grouped into the three dimensions of our experiential world: the body, the environment, and mental states (such as imagination, thinking, feeling, and remembering). All of this is achieved in the framework of anatomically determined feed-back relations between sensory organs, brain (centre) and motoric periphery. According to Roth and Schwegler, these dimensions result from secondary differentiations of the system itself and do not "belong" to different "domains of being" (4). There is a lot of evidence supporting the assumption that this self-differentiation differs quite remarkably from individual to individual. The authors conclude from these assumptions that each individual lives in his or her specific experiential world and that there must be more or less drastic divergences between these subject-dependent experiential worlds.

Due to the structure and function of the sensory organs as well as of the central neuronal system the cognitive system can only "accept" its own operations as reasons or stimuli for changes of its own states. Only by recursively operating on its own states can it establish boundaries between the system and the environment, thus generating the autonomy that preserves its own existence. By constantly applying its own operations to its own operations, the cognitive system creates an endogeneous order (which von Foerster has mathematically defined as "Eigen-values"). Here again it has to be underscored that the authors do not contest relations between cognitive systems and environments — otherwise the initial system/environment distinction would be meaningless. The environment can determine self-organizing systems in a causal and forecastable way — only when it is possible to simulate exactly the system's internal mode of operation.

Claiming that self-organizing systems are autonomous does not imply that they are isolated. Autonomy results from self-referentiality; in other words, "the relevance of all cognitive operations for behaviour can only be evaluated in relation to other cognitive operations and their impact. An evaluation in relation to 'objective givens' is impossible, since 'objective givens' have neither sense nor meaning"[8] (Roth and Schwegler 10. S.J. Schmidt, trans.). What we need in order to orient our activities in a successful way is not an objective copy of "reality" but merely a criterion like

8 "... daß die Bedeutung aller kognitiven Akte für das Verhalten stets nur an anderen kognitiven Akten und ihren Bedeutungen evaluiert werden können. Eine Evaluation an den 'objektiven Gegebenheiten' ist prinzipiell unmöglich, da die 'objektiven Gegebenheiten' gar keine Bedeutungen und keinen Sinn haben" (10).

viability. We must know or experience whether or not our constructs are viable in a problem-solving situation — whether they are objectively true or not is irrelevant at the level of processing. That question appears only at the level of second-order observations.

The essence of a constructivist epistemology is expressed in the distinction between "reality" and "actuality." "Actuality" designates the phenomenal world of our experiences, a world constructed by our real brain; this brain is cognitively inaccessible — even if one could open up one's head and look at one's brain. The construction of actuality does not happen in the phenomenal world since the constructor of our actual world(s) cannot be contained in it. This construction happens instead in a "reality" that is independent of our actuality. This reality is inaccessible to our experience but its existence must be postulated for logical as well as for ontological reasons. Nevertheless, we can formulate hypotheses concerning this reality, and these hypotheses must meet the requirements of reasonable argumentation in the social world of science. These hypotheses can never be checked directly, because nobody can observe the relation between reality and actuality.

By introducing the reality/actuality-distinction Roth and Schwegler try to resolve an alleged contradiction in constructivist thinking: how can constructivists regard the contents of actuality to be constructs while accepting, at the same time, that these constructs cannot arbitrarily be changed by us? The authors argue as follows: through genetic presuppositions and long-term experience the real brain "knows" what is viable in the real world. This knowledge directs the construction of actuality without removing its constructedness. Thus they conclude that "We as cognizing subjects are not the constructors of our perceptions and the source of our knowledge"[9] (11. S.J. Schmidt, trans.).

4. HOW RELIABLE ARE OUR CONSTRUCTIONS OF ACTUALITY?

Constructivists are often accused of being idealists or solipsists, and are attacked for advocating arbitrary constructions of reality. The distinction between actuality and reality introduced in the last paragraph can already serve as a first counterargument to this reproach. A second argument can be stated as follows: since human beings evidently dispose of similar instruments of perception and since they live together in permanent interaction, the units of interaction — called objects — resemble each other more or less,

9 "Wir als Erkenntnissubjekte sind nicht die Konstrukteure unserer Wahrnehmung und die Quelle unseres Wissens" (11).

and their constructedness escapes our attention (like a blind spot, so to say) unless we operate as second-order observers. As von Foerster writes:

> As the organism, due to its nervous activities, can only have knowledge of its own behaviour, these objects are, strictly speaking, signs for their varied own ways of behaviour. Consequently, objects are not primary entities but subject-dependent competences which have to be learned and which are, at the same time, influenced by the cultural context.[10] (1992, 279. S.J. Schmidt, trans.)

Von Foerster has provided detailed analyses of ways in which human observers — theoretically modelled as operationally closed self-organizing systems or non-trivial machines, depending on history and culture — constantly strive to transform their environments — including the other observers therein — into trivial machines with definite input- and output-relations. If in our society, language and culture, social roles, clothing and hairstyle are instrumentalized to trivialize non-trivial machines (especially other human beings) the goal is to reduce their unpredictability and indeterminacy in order to facilitate interaction and communication in a pragmatic way. The situation becomes even more complex the further we get from so-called sensory perception and move on to communication, conflict, discourse, and history. Certainly it is no accident that in these domains even "hard realists" grant more importance to "subjective factors." From a constructivist point of view, however, there is no essential difference with regard to constructivity. In both domains observing systems construct their meaningful actualities and try to make them compatible with others via interaction and communication. But, as we all know, it is much harder to trivialize other observers and come to a pleasing consensus in the social domain compared to establishing a consensus with regard to the existence of simple objects in a room.

The alleged objectivity of experimental scientific research does not, as constructivists say, result from a true copy of reality, but from methodically controlled trivialization. In other words, in empirical research data are constructed under conditions with reduced complexity, and these data are then rendered significant in the framework of theories and models.

This argument brings us back to the problem of the observer. Luhmann has repeatedly emphasized that observation is an empirical and in turn

10 "Da jedoch der Organismus aufgrund seiner Nerventätigkeit nur Wissen von seinem eigenen *Verhalten* haben kann, sind diese 'Objekte' strenggenommen Zeichen für die verschiedenen 'Eigenverhaltensweisen' des Organismus. Daraus folgt, daß Objekte oder Gegenstände keine primären Entitäten sind, sondern subjektabhängige Fertigkeiten, die gelernt werden müssen und die daher auch durch den kulturellen Kontext beeinflußt werden" (1992, 279).

observable operation depending on specific presuppositions, such as the structure and possible functions of the sensory organs, the way the motor periphery and brain work, and the memory functions or the emotional steering of cognitive operations by the limbic system. One of the most important prerequisites to our construction of actuality is of course language, which is acquired in a long process of (self-)socialization. Constructivists prefer to regard language as an instrument for coordinating behaviour, instead of modelling it exclusively as a semiotic system. Semantic reference is accordingly conceived of as a linguistic operation which relates to communication and not to the environment. In other words, language regulates behaviour by designating distinctions, thus allowing their social processing.

In functionally differentiated societies the contingency of observations is further restricted by discourses specific to social systems, i.e. by coherent domains of themes and knowledge plus pertinent forms and modes of communication (such as genres, styles, and metaphors). Finally, at the most general level, the contingency of observation is restricted by what is called culture. In a rather general way culture may be defined as a program to thematize — on all levels of communication — the fundamental dichotomies which lay the basis of a society's "world model." Among those dichotomies are, for example, real/fictive, good/bad, true/false, sacred/profane, poor/rich, beautiful/ugly, male/female. In terms of commonly shared collective knowledge, the "program culture" is differentiated into "cultural models," and provides cognitive and communicative systems with a framework of topics, values, images and legitimations. Culture is in turn confirmed and stabilized by cognitive and communicative operations (cf. Schmidt 1992a). Here again we might say that culture is constructed via the self-referential and self-organizing emergence of Eigen-values. Society constructs actuality and it does so conditioned by communication and culture; cognitively in the individuals as empirical instances of information-production, communicatively in the discourses performed by social systems in functionally differentiated societies. These constructs are reaffirmed by other constructs, not by comparison with the reality. This confirmation is achieved via the introduction of social criteria for the acceptability, evaluation, and continuation of these constructions. Consequently, the social construction of actuality is theoretically modelled in terms of a self-referential, self-organizing and self-legitimating process in which individuals participate to various degrees. The correlation of these participations seems to be temporal rather than causal, since every system (be it cognitive or communicative) controls its constructions of actuality by observing its own observations or other observers. As self-referential systems — cognitive or communicative ones — co-evolve in time, they ensure each observer's actuality construction by mutual observability.

Let me sum up these considerations: in the process of perceiving, for example, a glass on a table, the (first-order) observer is perfectly and justifiably sure that he or she sees what he or she sees and that the glass on the table exists. Only if this observation is observed by a second-order observer does it turn out that the process of perceiving makes use of distinctions which are dependent upon the observing system (e.g. the figure/ground-distinction) and its operational closure. The distinction between perception and object (or subject and object) is a distinction (= construction) which is used to "dissect" (= to observe) the environment. The unity of this distinction is the blind spot of the operation of perception. Accordingly the blind spot, made invisible in cognitive processes, serves as a "reality-guarantee" for the first-order observer.

5. CONSTRUCTIONS OF ACTUALITY AND THE MASS MEDIA

It goes without saying that the mass media today play an important role in making experiences and producing knowledge in all domains of communication; the media are crucial in politics, the economy, education, and so on. Mass media have evidently become instruments of actuality-construction which can no longer be overlooked.

The mass media seem to establish a world-model which — allegedly — is commonly shared by more and more people all over the world (in the so-called new world order). They evoke a feeling of participating in all the important "real events" all over the world. The problem with regard to these alleged functions is that the media, especially the audio-visual mass media such as television, do not and cannot represent reality, but stage and present something as reality. Accordingly, the basic problem concerning the mass media is authenticity. The authenticity of pictures (= visual surfaces) can no longer be reliably deduced or inferred from the pictures themselves. Instead, contextual information, program positions, media genres etc., in sum the totality of staging and presentation, have to be taken into consideration if we are to figure out how audio-visual surfaces have been realized and what kind of reference we can attribute to them.

In the past, prior to the introduction of the audio-visual media, only the pictures of the fine arts held their reference in suspense and drew the onlookers' attention to form. Today, more and more media-images hold their reference in suspense and draw the recipients' attention to their aesthetic qualities, a good example being recent trends in advertising (cf. Schmidt 1990a). It is the television viewers who either see pictures of reality — or just the reality of pictures on the box, and some of them are deciding that the very difference between these two options cannot be decided on — or does not matter. Some grant each medium its own reality, not worrying about discrepancies between the different media realities. As early as 1972,

E. Carpenter summarized empirical observations of young North Americans' use of the media as follows: "they regard media as self-contained environments, having little correspondence with other realities or environments. TV is its own reality, radio its reality, film still another reality. Each creates its own space, its own time" (45).

The mass-media undoubtedly form an integral part of everyone's environment. They shape (self-)socialization, communication, and the realization of cultural programs. Accordingly, the construction of actuality is more and more "imbued" by the media. For many of us real is what appears on TV. This is perhaps one of the reasons for the increasing fascination with cyberspaces, virtual realities and pictures without reference even though — or perhaps just because — these phenomena attack the reliability of our visual perception and replace (the principle of) two-valued mimesis by (the principle of) one-valued simulation.

In societies determined by the mass media we seem to be increasingly occupied with defining — in an operative and pragmatic, and no longer in an ontological way — what we accept as actuality. We try to adapt our activities to it and expect others to behave in a way that is compatible with our own attributions. In other words, the concept of actuality is contextualized in the framework of pragmatic operations which first and foremost define the "reality status" of cognitive as well as communicative operations. Consequently a strong element of temporalizing affects all constructions of actuality, which increasingly manifest their contingency. Constructions of actuality, unmoored from ontological concepts of reality, turn out to be systems-dependent. Actuality constructions are pluralized and differ from one another according to their acceptability, viability, their operationalization and their relevance for problem-solving and survival.

Today, this practical experience of the constructive and contingent character of "our world" — partially as a result of the media — becomes more and more an everyday experience, which in turn is increasingly thematized by the media. In this manner, a development that started in terms of functional differentiation in the late 18th century is accelerated. Social systems develop their system-specific models of actuality. The criteria for this pluralization of actuality models reside in the procedures and processes of their construction and in the specificities of their use or application; these criteria are not at all applied arbitrarily, but are negotiated via communication and interaction in the respective social systems.

This hasty look at some essential features of modern mass media societies suggests the conclusion that constructivist thinking, as a theory of cognition, has evidently emerged as a result of (or is at least closely linked to) the social evolution of a functionally differentiated mass media society. Constructivists are no longer vexed by the question how subject and object relate to each other, how the objectivity of perception can be achieved and

justified, and how true theories of individual and society are to be developed. Instead constructivists analyze the mechanisms, presuppositions, and criteria of/for cognitive and communicational constructions of actuality, viewing self-organization as the modus operandi of these constructive devices. This kind of constructivism, which essentially relies on von Foerster's work, might be called "operative constructivism."

6. CONSTRUCTIVISM AND LITERARY STUDIES

The essentials of constructivism have remarkable consequences for literary studies as well. As I have already developed and discussed these consequences in detail in several books and articles, I shall be brief on this subject in my concluding remarks.[11]

(a) A first consequence can be expressed with the slogan: "from literary texts to literary systems." The reason for this proposal is that the construction of meaning has to be located in self-organizing cognitive and communicative systems. In other words, if literary texts are no longer taken as objective givens bearing their meanings and values in themselves, then we have to look at the systems that process (produce, mediate, receive, and post-process) phenomena in order to turn them into literary phenomena. The key question is no longer what a literary text means, but how systems create, process, evaluate, canonize, etc. literary phenomena in the framework of the literary social system (cf. Schmidt 1990b).

(b) Any answer to this question requires empirical research into the structures, mechanisms, processes, and values governing those cognitive and communicative operations that focus on phenomena deemed literary according to implicit or explicit criteria of literariness. Consequently, literary studies have to be transformed into empirical studies in the framework of social and cultural studies (cf. Schmidt 1982, 1983a, 1983b).

(c) If we acknowledge the increasing role of mass media in all processes of actuality-construction, the print medium, which until now has been the privileged medium of literary phenomena, appears to be but one medium among others — one that has to compete — especially with the audio-visual media — for the attention of those involved in cognitive and communicative processes. In order to discern the specificity of literature we consequently have to observe the difference between literary works and other media offerings. This shift in perspective automatically transforms literary studies into a special branch of media studies (cf. Schmidt 1990c).

11 For an extensive, although not complete, bibliography of works of the Empirical Science of Literature/Constructivist Theory of Literature orientation cf. Tötösy (71-86).

(d) The concept of "the empirical" has to be reinterpreted in a constructivist framework. "Empirical" can no longer be defined in terms of "copying reality," as has been the case in some positivist and empiricist traditions. Instead, "empirical" means explicitly observing observations, in other words, observing the construction of data and their interpretation in explicitly spelled-out theories. In other words, empirical research means obtaining explicit control over the processes of constructions which lead to Eigen-values (= objects).

(e) Interpretation, which used to be one of the main concerns of literary studies, will be de-centred in a constructivist conception of literary studies. Since understanding cannot be objectified, and since meaning is no longer considered to be contained in the text itself, but as constructed cognitively and communicatively in the processing of textual materials, interpretation is recognized as an essayistic activity as opposed to a scientific procedure (cf. Schmidt 1983b, 1991c).

(f) Writing histories of literature, too, which can only be performed in the present, is viewed as a constructivist operation rather than a reconstructive one. History and the past are present constructs, depending on the devices, interests, needs, informations, materials, and values at hand now. This insight should affect our historiographical endeavours such that we become more sensitive to historiographical operations and their blind spots, which invisibly seem to guarantee the degree of reality we tacitly attribute to their outcomes (cf. Schmidt 1985).

These brief remarks are only meant to give a rough idea of some of the far-reaching transformations literary studies face when they seriously confront the essential intuitions of the epistemology of an operative constructivism. I think this challenge is quite thrilling, and can — if we are willing to accept this confrontation — lead to a new age of literary studies.

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On Metaphor in Poetry

To begin with I want to make some brief remarks on the functions of metaphor in general. What functions do metaphors have? Why are there metaphors at all?

I think that metaphors have three main functions in various contexts of human communication, viz. an emotive, a persuasive and a cognitive function. In the first case, a metaphor serves to express and transfer emotional attitudes. In the second it serves to persuade the audience as regards a course of action or a point of view. And in the third, it serves to express knowledge and belief and other cognitive insights. Striking examples of the emotive function of metaphor are metaphorical terms of abuse or praise, like "beast" and "angel." Examples of the persuasive function can easily be found in political and commercial propaganda. Metaphors with a cognitive function abound (or seem to abound) in philosophy, criticism, the humanities, and even in the sciences. In practice, the first and the second function will often overlap, as will the second and the third. To these three pragmatic functions we may add the role of metaphor as catachresis, i.e. the use of metaphor because no literal word to express the intended meaning is available.

These main functions of metaphor have been differently explained, depending on one's view of the meaning of metaphor in general.[1] Very briefly stated, in the past it was either substitution, or comparison, or interaction (projection; tension) that was considered to be the fundamental factor in the meaning of metaphor, and this has led to divergent views of the functions of metaphor as well.

Recently, there have been some attempts to explain the nature and the function of metaphor without any appeal to metaphorical meaning at all; that is, to explain the phenomenon of metaphor on the basis of its literal meanings only. Donald Davidson is the main and by far the most significant

1 The literature on metaphor is overwhelming. For a discussion of the main types of theories of metaphor, see Mooij (1976, esp. Chapters three, five, six and seven). A thorough discussion of the problems of metaphor in a historical as well as systematic perspective is Paul Ricoeur (1975, 1977). Ricoeur defends a tension-view of metaphor. An important recent study is Eva Feder Kittay (1987).

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