PREFACE

The circular view of the world

When the latest research report of the Biological Computer Laboratory was published on 1 November 1970, nobody could possibly have foreseen the repercussions of the ideas it contained. The essay of about 70 pages, entitled *Biology of Cognition,* represented a new departure in the history of philosophy and a central document for the school of thought that is known as constructivism today. Its author, the Chilean biologist Humberto R. Maturana, who was working in the USA at the time, in vigorous language pleads for the study of the processes of cognition from a biological perspective. Epistemology, the theory of knowledge — once a central domain of philosophy —is turned into a scientific discipline. It investigates thinking and perceiving by means of experiments and empirical procedures, and it completes this change of role both in self-presentation and methodology: the reflecting philosopher as the experimenter in the laboratory. Humberto R. Maturana unequivocally points out that all those seeking to probe the truth of what we perceive with the eyes of a biologist, will inevitably have to accept that they are themselves among the objects they want to describe. They are living systems that want to understand living systems. Human subjects study objects that are identical with themselves. The situation turns circular as perceivers struggle to understand the processes of perceiving. We are reminded of the mythological figure of the Ouroboros: the snake eating its own tail; a brain explaining the brain; human knowers striving to understand understanding. Human subjects turn into their own objects.

Humberto R. Maturana's essay, after only a few pages, comes up with a conclusion and a central statement that illuminates the basic tenets of constructivism, and thus the topic of this book, which is meant to be an introduction to this mode of thought in the form of interviews. His statement, at first glance, appears to be a triviality; on closer inspection, however, it discloses a different view of the world. It simply says: "Anything said is said by an observer." (Maturana 1979, p. 8) It is of crucial importance that the existence of an external reality is not denied here; that this is not a statement of solipsism declaring everything a chimera and figment of the individual mind. Nor can the author be suspected of being a naive realist. He does not believe in the observer-independent existence of objects that are — in an ontologically congruent way — mirrored in the human knower's mind. Maturana's views, and the constructivists' views in general, represent a middle course between the varieties of realism and the exaggerations of solipsism. Neither Maturana nor the other founding figures of the constructivist school of thought, which deals with the origin and creation of conceptions of reality, deny the existence of an external world; they all deny, however, that it is possible to know that external world in a subject-independent way. Every act of cognition, it is claimed, necessarily rests on the constructions of observers — and not on the point-to-point correspondence of perception and external reality. "Anything said is said by an observer."

Referring all knowledge back to knowing subjects manoeuvres these knowing subjects into the centre and makes them the focal topic. The ontological perspective, which entices us to search for invariable ontic facts, changes into a fundamental epistemological quest. We may and must now query how and what observers observe — and perhaps we can hope to find the answers in experiments on colour perception and gestalt comprehension. We may possibly expect to discover them in processes of stimulus encoding, and we may then attempt to show that the human brain, which has no direct contact with its environment, derives its internal perceptual riches that we *experience* as a colourful external world, from quantities of indistinguishable grey noise supplied by external stimuli. In other contexts, however, it is claimed that *reality* cannot be explained by recourse to the biological constitution of humans; its development and creation must be essen-

tially linked to social processes. It is, we hear, socially constructed and results from the dependence of human beings on groups and histories, on places and traditions. In this way, we could roam through disciplines and faculties — and everywhere encounter the millennium question of the observer. We come upon it in quantum physics and in systems theory, in the work of social psychologists and sociologists of knowledge, and we discover it in philosophy and cognitive science.

The discovery of the observer

However, the ominous figure of the observer, which seems to have become a stock in trade of any epistemological debate today, has not always been that prominent. It had to be uncovered and highlighted again by a number of cyberneticians, biologists, psychologists, and communication scientists — the originators of constructivism. They have provided key concepts for the international community of scientists, still relevant today, and they have managed to create an interdisciplinary forum for the critical discussion of crucial epistemological questions that has increasingly involved the general public. Their theses, concepts, and the possibilities of their application in management, education, and psychotherapy, are meanwhile debated even in the daily press. They are — following the order of the contributions to this volume — the physicist and cybernetician Heinz von Foerster, the psychologist Ernst von Glasersfeld, the biologists Humberto R. Maturana and Francisco J. Varela, the brain scientist Gerhard Roth, the communication scientist Siegfried J. Schmidt, the psychologists and family therapists Helm Stierlin and Paul Watzlawick. With their theories and models, stories and experiments, they have supplied new and epoch-specific arguments to substantiate the early epistemological doubts of the sceptics. They are united in their criticism of dogmatic positions of all forms and shapes, and they are precursors of an intellectual culture, which has removed the rigid barrier between the natural and the cultural sciences.

Still, despite everything the founding fathers of constructivism assembled here may have in common, there are naturally differences that divide them. Some of them describe the individual or even the individual brain as the relevant producer of reality; others base their conceptions on clearly larger-scale units like families, groups, societies, or cul-

tures. These different approaches cannot easily be reconciled because they rest on barely compatible premises. The biologists, cognitive and brain scientists, on the one hand, concentrate their constructivist argument primarily on the individual. Their focus of interest is on the singular and autonomous observer. For the communication scientists and the family therapists of a systemic persuasion, on the other hand, the emphasis is not primarily on the cognitive autonomy of human individuals but on their patently obvious social orientation. In their view, reality arises within the framework of a society — and that means that all individuals must be seen as entities that are formed by their societies and their cultures. They observe with the eyes of their groups, they see the world against the background of their origins, and they cannot, therefore, be regarded as virtually blind black boxes or monads because they are, under all circumstances, open and extremely receptive to external impressions.

One common denominator of the constructivists voicing their opinions here is, consequently, the concentration on the observer. The observer is the point of fixation for all the divergent interests; the observer, by general consent, plays the central role in any cognitive process. Despite all the differences, such a common research interest is in itself of great consequence, of course, because it entails the need to re-assess the investigative efforts of one's own in relation to those of others. It is, in particular, the evaluation of the description of a hypothesised external world that changes: if knowledge is strictly tied to the individual knower, then descriptions are necessarily always also self-descriptions. They reveal the cognitive strengths and weaknesses, predilections and interests of those who see and perceive something. The biologist and communication scientist Francisco J. Varela, who has meanwhile turned into a critic of constructivism, writes in one of his early papers about this possibly somewhat puzzling view of observation with great precision: "In finding the world as we do, we forget all we did to find it as such, and when we are reminded of it in retracing our steps back to indication, we find little more than a mirror-to-mirror image of ourselves and the world. In contrast with what is commonly assumed, a description, when carefully inspected, reveals the properties of the observer." (Varela 1975, p. 22) Such a view of things leads to the unpleasant realisation that our craving for certainty and

truth is shattered. The claim to objectivity has to be given up because one of the qualities of an objective description is that the properties of observers do not enter into it, do not influence and determine it. Heinz von Foerster's cryptically aphoristic definition of objectivity — another key statement of constructivism, and a topic of the first chapter in this book — can only be appreciated fully against this background: "Objectivity", he says, "is the subject's delusion that observing can be done without him."

Logical and rhetorical self-contradictions

We can, however, question the truth of this kind of truth and similar truths. Is it correct that everything depends on observers and that they are always present in their observations? What forces are at work in the real world of objects? When will objects resist the theses and theories we want to impress on them? How objective is the rejection of objective knowledge? Or more drastically: Is it true in an absolute sense that absolute truth is unknowable? Of course, questions of this kind cannot be answered, and certainly not in any definitive way; they are, as Heinz von Foerster would add, undecidable. We can only answer them personally for ourselves and we must, as a result, bear the burden of responsibility for such deeply personal acts of decision. Constructivist authors, who claim absolute truth for the assumption of the impossibility of attaining absolute truth, turn into meta-dogmatists and become entangled in a logical self-contradiction that may be expressed by the formula, "If they are right, they are wrong (and vice versa)." The use of an impersonal kind of language (exhibiting seemingly observer-unspecific characteristics) may, for this very reason, display a fundamental problem. A conventional researcher whose linguistic style excludes stories, parables, creative metaphors, and the description of personal thinking experiences, and who, in particular, clearly banishes all personal expressions from texts, must appear to write in a mode strongly suggesting claims to objectivity. Such language from constructivists and other sceptics creates a paradox, which we might term a *rhetorical self-contradiction.* In the case of a logical self-contradiction, statements are logically incompatible. The concept of a rhetorical self-contradiction means, however, that the chosen manner of expression, the diction, does not match the meaning to be conveyed. It indicates authority together

with a claim to finality and ultimate certainty, which can in no way be justified if the self-chosen premises are adhered to. It insinuates, through stylistic choices, the possibility of ultimate justification and objective description — and simultaneously questions it, on the content level, by using a diction and a jargon of irrevocability that is incompatible with the fundamental beliefs presupposed, beliefs that ought to inspire a different, more open and, in particular, an observer-bound manner of presentation and discourse. We could also put it this way: writing about constructivism inevitably raises the question of form, which in itself involves tackling the problem of form.

Although the interviews presented in this book may strike readers as not equally successful, I still believe that conversation and dialogue are particularly well suited to present the constructivist theory of the observer. Dialogue partners may contradict each other and even quarrel; specific insights, which might appear to command universal validity, if formulated by a single author, may be playfully approached from different angles without pushing towards final harmony and a synthesis obscuring all contradictions. The process of the emergence and the fabrication of thoughts becomes the actual point of fixation of what is to be achieved. The results surfacing in a real conversation are junctures for constantly extending and alternating one's thoughts. The exaggerations and fixations, the disparities and provocations, appear to be instances of transition and elements of a progression that fails to end in a new absolute. They are means and instruments, not result and certainty. The posture of an all-encompassing and unbroken presentation, which is required by ultimate truths and monolithic edifices of thought, is thus disrupted. The form is the message; a conversation, if at all successful, is always an expression of the basic constructivist thesis that *reality as such* does not exist but that there is a multiverse of diverse interpretations. As soon as one has understood that reality is something ineluctably individual and necessarily manifold, one quickly realises that the persons asserting this view are not at all in favour of being congregated in a party of believing constructivists. The very designation *constructivism* in the book's title implies, as several interviewees emphasised, a consonance of thought that simply does not exist. There is a certain danger that the peculiar characteristics of individual

research programmes and queries are lost under a label resembling a trendy slogan.

This is perhaps the reason why Humberto R. Maturana never uses the term in our conversation, why Heinz von Foerster prefers to be called a *curiosologist*, and why Helm Stierlin regards the era of constructivist textbooks with scepticism. It is a symptom, he says, of the coming to an end of a phase of creative anarchy, of wild, untethered thought production. There is the threat of an epistemological *biedermeier*. The constructivist thinking game is being turned into a norm, a new creed — a new truth. To avoid the fossilisation and dogmatisation of thinking, all so-called constructivists must constantly make clear that there can be no final proof and no observer-independent justification for their theses. Biology and brain research cannot, in any way, claim to be the trailblazers for the verification of constructivist assumptions; they can make them plausible, they can illustrate them, they can supply relevant indications, but they cannot prove their truth in an emphatic sense. Constructivism is itself only a construction (among many others); it cannot be tested for its truth but only for its utility, its viability. The main thing is, Ernst von Glasersfeld maintains in conversation, to develop effective procedures and assumptions, which will serve the purposes of particular observers. One must struggle to move forward, to explore whether one's theses and theories prove productive or whether the big unknown, ordinarily and quite roughly called *reality*, resists our interpretations. There are no plans for a new quest to conquer finality by way of seeking ultimate salvation in a modern variety of scepticism. On the contrary: "Any scepticism that is consistent can only be free-floating, well-founded but without foundations, or unfounded but with solid foundations, otherwise it will lose its magic and degenerate into dogmatism." (Fischer 1993, p. 96: translated from the German)

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