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http://www.univie.ac.at/constructivism/EvG/

In: S.A. Umpleby & V.N. Sadovsky (Eds.), A science of goal formulation. New York: Hemisphere, 1–8. 1991.

Knowing in Self-Regulating Organisms (A Constructivist Approach)

The earliest historical records we have of questions concerning knowledge and the activity of knowing are from the 6th century B.C. The thinkers who raised them are now usually referred to as pre-Socratics because, at least in the modern world, Socrates was famous before them.

What has been preserved from the pre-Socratics is nothing but a few fragments, the testimony of other writers, and the not always friendly references made to them by Plato in his dialogues. Nevertheless, there seems to be quite enough to show that several among these versatile men had no illusions about the possibility of "objective" knowledge. They realized full well that, once the knowing subject was separated from the objects that were to be known, there was an insurmountable logical obstacle. If the subject's "true" knowledge was to be a picture of the real world, one could never check its "truth" because there was no way of comparing the subject's knowledge with the objects it was supposed to depict.

In the history of Western theories of knowledge, the sceptics have never tired of repeating that argument and the professional philosophers have twisted and turned to find a way around it. They have come up with several very beautiful and even inspiring attempts, but it would be difficult to maintain that they have solved the problem.

The startling thing about this is that, although we cannot prove the truth of our knowledge, we seem to have a remarkably stable experiential reality in which we carry on with our daily living. We formulate explanations, we make predictions, and we even manage to control certain events in the field of our experience. Not only that. We also have scientific knowledge, and it seems to be the most solid. We rely on it, and it allows us to do many quite marvelous things.

For epistemologists, then, it may be useful to look at how we come to have that kind of knowledge. From my point of view, Humberto Maturana has provided the most lucid analysis of the procedure that is usually called "the scientific method".[1]

Maturana divides the procedure into four steps:

1) OBSERVATION. In order to count as "scientific", an

observation must be carried out under certain constraints, and the constraints must be made explicit (so that the observation can be repeated).

2) Observations may then be related by an HYPOTHESIS, usually an inductive hypothesis that involves causal connections.

3) By deduction a PREDICTION is derived from the hypothesis, a prediction that concerns an event that has not yet been observed.

4) The scientist then sets out to observe the predicted event; again, the OBSERVATION must take place under certain explicit constraints.

Throughout the four steps, what matters is experience. Observing is a way of experiencing and, to be scientific, it must be regulated by certain constraints. The hypotheses by means of which one then relates one's observations, connect experiences, not "things-in-themselves". The predictions, again, regard experiences, not events in some "real" world that lies beyond one's actual experience.

Seen in this way, the scientific method does not refer to, nor does it need, an ontological reality – it concerns exclusively the experiential world of observers.

Scientific knowledge, then, does not and could not yield a picture of the "real" world; it provides more or less reliable ways of dealing with experience. Hence it may be viable, but it can make no claim to "Truth", if "Truth" is to be understood as a correspondence to the ontologically real world. On the other hand, this way of looking at knowledge, be it scientific or other, makes it immune against the sceptics' perennial argument. Since this constructivist notion of knowledge does not claim to provide a picture of something beyond experience, the fact that one cannot compare it with such a something, does not detract from this kind of knowledge - it is either viable or it is not. Indeed, as a constructivist, I tend to go one step further: Since we have access only to experience and cannot get outside the experiential field, there is no way one could show that one's experiences are the effects of causes that lie outside the experiential world.

Saying that we have no cognitive access to a world beyond our experience may suggest to some that any such theory of knowledge must be very close to, if not identical with, the dreaded heresy of solipsism. I do not think that this applies to the kind of constructivism I have been promoting.

The reason is simply that, although we deny the traditionally posited iconic relation between knowledge and ontological reality, we substitute for it a different but no less specific relation. Unlike the notion of "truth", which requires a match, i.e. shared points, between the picture and what it is to represent, the notion of "viability" requires fit which, in this context, could be characterized precisely by the absence of shared points. The concept of "viability", however, does imply that there are or will be obstacles and constraints that impinge on whatever aspires to becoming viable. It is not the case that "anything goes", and it is precisely through its obstructions that ontological "reality" manifests itself: by impeding some of our actions and by thwarting some of our efforts. The salient point in all this is that, since this "reality" manifests itself only in failures of our acting and/or thinking, we have no way of describing it except in terms of actions and thoughts that turned out to be unsuccessful.

However, even if we accept this way of thinking for the moment, we would like to have a kind of knowledge that we can call "objective" as opposed to some lesser kinds of knowledge. I have elsewhere proposed a model that provides "objectivity" at the highest level of experiential reality.[2] Needless to say, this constructivist objectivity does not lie in or even point to a world of things-in-themselves, but lies wholly within the subject's field of experience, because it arises through the corroboration of

"Others" which the subjective observer can construct within his or her own experiential domain. This construction is, in fact, an extension of a suggestion Kant made in the 1st edition of his Critique of Pure Reason:

> "If one conceives of another thinking subject one necessarily imputes to that other the properties and capabilities by which one characterizes oneself as subject."[3]

This creation of Others in our likeness does not happen all at once. It begins quite harmlessly with the child imputing the capability of spontaneous movement to items in the experiential field that do not stay put. It is followed by the imputation of visual and auditory senses to animals, and it is crowned by the imputation of goal-directed behavior, deliberate planning, and experiential learning to Others whom one considers "like" oneself. Once this level of sophistication is reached, one spends a great deal of time explaining, predicting, and attempting to control these Others. That is to say, one now has models of moving, perceiving, planning, thinking, feeling, and even philosophizing Others in one's experiential field, models to whom one imputes the kinds of concepts, schemes, and rules one might oneself abstract from one's experience. These models incorporate some of the knowledge we ourselves have found useful and thus viable in our own dealings with experience. If, then, we are able to make a successful prediction about any one of these Others, the particular piece of knowledge which, in making the prediction, we have imputed to the Other, acquires a second order of viability: we now feel justified in saying that this piece of knowledge was found to be viable not only in our own sphere of actions but also in that of the Other. This, I believe, is as close as a constructivist can come to "objectivity".

It is obvious that the construction of a viability of which I can say with some justification that it seems to reach beyond my own field of experience into that of Others, must play an important part in the stabilization and solidification of my experiential reality. In fact, it helps to create that highest level of which we then believe that it is shared by Others and, therefore "more real" than anything experienced only by ourselves.

This kind of corroboration, one might think, is much more easily and much more generally achieved by linguistic communication. From the constructivist point of view, however, the notion of "sharing" as a result of a linguistic exchange turns out to be the result of the very same kind of imputation we have discussed above. This brief summary is not the place to expand on the constructivist approach to language and communication.[4] All I want to say here is that, in spite of the fact that it often feels as though the meaning of words and sentences were conveyed to us by the sounds of speech or the signs on a printed page, it is easy to show that meanings do not travel through space and must under all circumstances be constructed in the heads of the language users. If we then ask, what these meanings could be made of, we find that the only raw material available is the stock of experiential records the individual language user has so far accumulated. There is no doubt that these subjective meanings get modified, honed, and adapted throughout the course of social interaction. But this adaptation does not and cannot change the fact that the material of which these meanings consist can be taken only from the individual language user's subjective experience. (Note that, in this respect, social adaptation is analogous to

biological adaptation: it can do no more than bring out, recombine, or thwart what is already in the organism – it cannot instill new elements.)

It may be useful to repeat that constructivism does not deny reality, nor does it deny that the living organism interacts with an environment; but it does deny that the human knower can come to know reality in the ontological sense. The reason for this denial is simply that the human knower's interactions with the ontic world may reveal to some extent what the human knower can do – the space in which the human knower can move –, but they cannot reveal the nature of the constraints within which the human knower's movements are confined. Constructivism, thus, does not deny[4] the "existence" of Others, it merely holds that insofar as we know these Others, they are models that we ourselves construct.

In the light of what was said above about the levels of the reality that we construct of our experiences, Others are of very great importance: without them, we could not attain the highest level of that experiential reality. Thus, we need Others.

In the Western philosophical tradition, attempts to create a rational basis for ethics have never succeeded in finding an unquestionable justification for the initial assumption that we ought to consider Others as we consider ourselves. The model of the cognitive organism as a self-regulating entity that builds up "knowledge" as ways and means to maintain itself in whatever space the ontic world has left for it to live in, this model seems to justify the human organism's need for Others and, in doing so, it justifies the first requirement of any ethics on epistemological rather than on ethical grounds.

This, it seems to me, could have some far-reaching consequences. Once Others are seen as an epistemological requirement needed for the construction of our own experiential reality, we may be able to counteract some of the influence the concept of competition has wielded for so long owing to its unfortunate and largely erroneous association with the theory of evolution. Similarly, since the notion of "controlling others" tends to destroy the possibility of corroborating the viability of one's own cognitive structures, the constructivist approach to ethics would foster tolerance.

When competition and control of others are eliminated, we may come to have an interactive pattern of mature humanity. That pattern I would call "collaborative dialectic", because it would be very much like the pattern of biological evolution which, according to the most recent findings seems far less competitive than co-evolutionary.

Conclusion: If knowledge can be considered the result of the adaptive effort of cognitive organisms in their struggle to maintain their equilibrium in the face of perturbations, it does not seem reasonable for them to use this knowledge to compete with one another. On the contrary, it seems that in order to maintain not only their own equilibrium but also that of the planet on which they find themselves living they would have to foster in every conceivable way every kind of mutual collaboration.

Footnotes

1 To be published in *The tree of knowledge*, a forthcoming book by H. Maturana & F. Varela.

2 von Glasersfeld, E. *Steps in the construction of "others" and "reality": A study in self-regulation*. In Power, Autonomy, Utopia: New Approaches toward Complex Systems. New York: Plenum Press, 1986; in press.

3 Kant, I. *Kritik der reinen Vernunft*, (1. Auflage, 1781). Berlin: Akademieausgabe, Bd.IV, p.223.

4 von Glasersfeld, E. On the concept of interpretation. *Poetics*, 1983, 12, 207–218.
