Aspects of Constructivism: Vico, Berkeley, Piaget

Constructivism is a way of thinking about knowledge and the activity of knowing. For me, this way of thinking arose out of the practice of psycholinguistics, cognitive psychology, and some ten years of studying the works of Jean Piaget. In my effort to assimilate Piaget's ideas into a coherent, non-contradictory model of what I would call our rational component, I may, as some knowledgable Piagetians have remarked, have gone beyond what Piaget intended when he spoke of "constructivism." That is one of the reasons why, at a certain point, I decided to call my way of thinking "Radical Constructivism."

Recently the reviewer of a paper of mine commented that this approach to the problems of knowledge is "post-epistemological." I like this description because it accentuates the radical shift of the relation between knowledge and ontology. This shift replaces the conventional notion of ontological truth with the notion of experiential viability and leads to a far-reaching reorganization of the way we think of the world. I hasten to add that the constructivist perspective is not a new invention. I claim no credit for it, except as the coordinator of other people's ideas.

In what follows I briefly want to explain my interpretation of certain key ideas proposed by three among the thinkers from whom I drew as I was formulating the radical theory of knowing.

Vico and Berkeley have been dead for almost two and a half centuries, Piaget for a decade. None of them, I suspect, would agree whole-heartedly with my interpretation of what they intended to say. This does not greatly worry me. All three tended to disagree with most, if not all, of the interpretations of their work that came to their eyes during their life time. Had they witnessed the most recent developments in the philosophy of science, they might have been radicalized themselves.

One of the reasons why they were bound to be misunderstood was the simple fact that their thinking was truly original and involved a drastic change of some very basic concepts such as 'being', 'truth', and 'reality.' When they wrote about their ideas, however, they had to use words of the given language, words which their readers were likely to understand in terms of customary meaning, not in terms of a novel conceptualization.

Conceptual change, one might think, can be announced and made clear by means of explicit definitions. This sounds quite easy. In practice, however, it often goes wrong. Vico,

Berkeley, and Piaget, each in his way, provide excellent examples of the problem. I shall take the two earlier ones, who were close contemporaries, first.

Vico's Breach of a Philosophical Tradition

In the year 1710 two treatises on epistemology were published at opposite ends of Europe, one in Naples by Giambattista Vico, the other in Dublin by George Berkeley. Both authors broke with the age-old philosophical belief that human knowledge must in some way provide a representation of an observer-independent material reality. To many such a breach of a venerable tradition did not only seem unacceptable but indeed inconceivable.

When Vico said that humans can know only what humans have made, whereas God can know the world because He created it, his readers did not see, or did not want to see, that this statement implied not simply a restriction, but a change of the concept of human knowledge. In the philosophical tradition of the Western world, "to know" meant to have captured something that was true because it was "objective." And in this tradition, to be objective meant to represent something as it was supposed to exist in itself and for itself, something that was as it was, irrespective of any knower.

Most of the great philosophers were careful to mention that the human representation of the objective world would never be more than an approximation, but they nevertheless held out the hope that the approximation could become closer with time. This, indeed, was the basis of the general belief in the progress of knowledge and that this progress could be measured in terms of a better match with reality.

The sceptics, of course, had always argued that such a match between knowledge and reality could not be ascertained because knowledge could be compared only with other knowledge and never with reality itself. Since the sceptics' arguments could not be logically refuted, philosophers tried to get around them in the most ingenious ways. Their efforts make fascinating reading but, after more than two thousand five hundred years, it is fair to say that they did not succeed. One interesting aspect of this struggle is the fact that neither the sceptics nor the other philosophers thought of changing the concept of knowledge. In contrast, Vico's treatise suggested precisely that. He crystallized this view in the striking phrase: God is the artificer of nature, man the god of artifacts.[1] This entails a radical change. If humans can comprehend only what the human mind has made, namely its artifacts or, as we might say today, its "models", it is clear that the human mind could never comprehend God's reality.

Vico's notion that in order to know something one has to be able to account for the elements it contains and to trace the steps taken in putting them together, shifts the focus of attention from a supposedly pre-existing world to the active, generating agent of cognition. Instead of a passive recipient of data or "information", the cognizing subject is now the maker of knowledge. This change of perspective, obviously, has serious consequences for the notion of science and the character of scientific knowledge which, as a rule, is thought to be objective and therefore capable of providing the most reliable way towards a "true" representation of the observer-independent "real" world. Vico saw this with admirable clarity and did not hesitate to give us a revolutionary definition of human science as the endeavor "to make things correspond to one another in handsome relations."[2] The "things" he has in mind are, of course, the products of the human activities of perceiving and conceiv-

ing, that is, human constructs. Hence one can see in Vico the pioneer who explicitly embarked on the road of constructivism.

Berkeley's Definition of Existence

Berkeley was not as explicit with regard to the subject's constructive activity, but he was no less incisive in his contention that the things we perceive are the result of our perceptual activity and cannot be said to have "existence" in themselves. Innumerable philosophical discussions have been written about his famous dictum "esse est percipi", but all I have seen are flawed from my point of view. Berkeley introduces the Latin phrase that states that "being is to be perceived" at the very beginning (§3) of his treatise *Of the principles of human knowledge* and he uses it to present as crisply as possible his view concerning "what is meant by the term exists, when applied to sensible things":

> The table I write on I say exists, that is, I see and feel it; and if I were out of my study I should say it existed – meaning thereby that if I was in my study I might perceive it, or that some other spirit actually does perceive it. There was an odour, that is, it was smelt; there was a sound, that is, it was heard; a colour or figure, and it was perceived by sight or touch. This is all that I can understand by these and the like expressions. For as to what is said of the absolute existence of unthinking things without any relation to their being perceived, that seems perfectly unintelligible.[3]

I do not think that this passage is difficult to understand, provided one does not feel compelled to reconcile it with a preconceived idea of what "existence and the like expressions" must mean. Yet, Berkeley's contemporaries and his later commentators were unable to overcome this compulsion. They have gone, and still go, to great lengths to unravel how Berkeley might have intended the statement *esse est percipi* when it must have been obvious to him that the table he was writing on did not have to be perceived in order to exist. His philosophical critics are unable or unwilling to see that he is simply suggesting a new definition.

Berkeley argues that, qua experience, the table cannot be generated by anything but acts of perception which the perceiver coordinates to form the thing that goes by the name of "table." Where human knowledge is concerned, therefore, "sensible things", i.e., the sensory objects of which we are inclined to say that they "exist", are the objects we generate as we perceive.

In other words, Berkeley creates a definition of what it means "to exist" that seems unacceptable to traditional philosophers, because their tradition has held for over two thousand years that perception requires, as Socrates said, that something must exist before it can be perceived.

This, needless to say, is, a very partial exposition of Berkeley's epistemology. He is well aware of the fact that, once perceived, the idea of a thing can be re-presented, reflected upon, modified, and named by the human mind to serve in other circumstances – and that, once named, the name of the idea can be generalized. And in perfect consistence with this, he says that general ideas do not exist, because what we perceive is always a particular individual. He is also aware of the fact that the perceptual coordination that generates "things" from simple sense impressions requires relational notions which, themselves, are not perceptual. Consequently, these notions, that include space, time, and number, are "things of the mind" for him and do not belong to the realm of existence that is determined by perception.

This, I would claim, is perfectly compatible with Vico's assertion that the human mind can know only what the human mind itself makes. Indeed, in his *Alciphron*, discussing the knowledge we might have of God, Berkeley says:

> Passions and senses, as such, imply defect; but in knowledge simply, or as such, there is no defect. Knowledge, therefore, in the proper formal meaning of the word, may be attributed to God proportionably, that is, preserving a proportion to the infinite nature of God. We may say, therefore, that as God is infinitely above man, so is the knowledge of God infinitely above the knowledge of man.[4]

One might interpret the difference between human knowledge and God's as a merely quantitative one, but given Berkeley's firm assertion that, for us, only what we can perceive has existence, I prefer to believe that the world God knows must be the result of a rather different divine perception.

Hence, as a crude capsule of the two treatises of 1710 one could say that the Neapolitan proposed a change of the concept of human knowledge and the Irishman a change of what is meant by the expression "to exist."

Piaget's Contribution

Both these proposals are contained in Piaget's famous principle: "Intelligence organizes the world by organizing itself."[5] But there is a big difference between the two 18th century philosophers and Piaget, if one considers what prompted them to embark on their unorthodox ways of thinking. Vico and Berkeley were driven to approach the problem of human knowledge for two reasons. They profoundly disliked scepticism, which, though it had successfully undermined the concept of objective knowledge, was unwilling to relinquish it. Both Vico and Berkeley were convinced that Descartes had not only failed in neutralizing the sceptical disintegration of traditional values and beliefs but had indeed aggravated the situation by his pursuit of doubt in order to establish certainty. In contrast, Piaget, developed his constructivism on a biological basis.

In his works, Piaget frequently reiterates two points that are of fundamental importance in his epistemology:

1. knowledge is not a copy of reality but an accommodation to reality; and
2. the cognitive activity is adaptive.

If one insists on interpreting these statements within the framework of the traditional theories of knowledge (which have taken no account of either Vico's or Berkeley's proposals), one will be driven to conclude something like the following: It is no great revelation that knowledge cannot be a copy of what exists – knowledge, after all, is a mental commodity, and the world that exists is material; and to say that it is adaptive, is simply to state what we all believe, namely that our knowledge, as we work at it over time, tends to provide a better correspondence with reality.

This, I claim, disregards the fact that Piaget started as a biologist, investigated cognition as a biological function, and was not concerned with any traditional epistemology. As a boy, he transplanted mollusks from a lake to a fast flowing brook and observed that their next generation had accommodated their shape to the flowing water. Not having read Piaget's teen-age publications, I do not know whether he drew any general conclusions from the experiment at that time. However, it must have laid the foundation for his later work on the forces that operate in evolution. In any case, when he wrote The construction of reality in

the child he had formulated the principle according to which individual organisms accommodate when their internal equilibrium is perturbed.

Adaptation, thus, does not mean that organisms become like the environment, but rather that they find a way of "surviving" in the face of such environmental perturbations as they experience. Cognition, then, is an adaptive function, not because it might (or should) produce a mental representation of an independent objective world, but because it endeavors to produce viable conceptual structures that enable the cognizing subject to fit into the world it experiences. One of Piaget's descriptions of this process is:

> The general model of equilibration shows the interaction between observables and coordinations, that is, the collaboration of empirical and reflective abstrac1ions on all levels.[6]

Piaget's "observables" are obviously perceived and therefore belong to what Berkeley posited as "existing." The coordination of such sensibilia by means of empirical abstraction then give rise to the items that Berkeley called "sensible things" or, more strikingly, "the furniture of the earth."[7] And the actions of coordinating and abstracting involved in this process are actions of the cognizing subject or, in Vico's terms, are made by the subject and therefore accessible to its knowing.

With regard to reflective abstraction, Piaget has made it very clear that this way of operating would not be possible without the use of symbols. This, again, is something that Berkeley was well aware of when he said: "It is not, therefore, by mere contemplation of particular things, and much less of their abstract general ideas, that the mind makes her progress, but by an apposite choice and skilful management of signs."[8]

In spite of such echoes and apparent compatibilities, however, it would be doing violence to Piaget's epistemology to equate it with Berkeley's or Vico's. Whereas the Irish philosopher clearly asserts that his "sensible things" do not imply the existence of things in themselves prior to the acts of perception, and in Vico's view "man's artifacts" are in no sense replicas or copies of objects in God's world, Piaget does not altogether remove human knowledge from the notion of an independent ontological reality – he merely changes the relationship between the two. To him, as biologist, the constructs that result from empirical and reflective abstraction are at best adapted to the experienced environment. Like the physical structures that arose in biological evolution, the concepts and the picture of the experiential world which a cognizing individual constructs must prove viable in maintaining that individual's equilibrium. Thus the function of the cognitive capability is not to produce a "true" picture of an independent objective world, but rather to produce a livable organization of the world as it is experienced.

I have often been told that this is too radical an interpretation of Piaget. All I can answer is that in my view no interpretation, not even mine, should ever be considered the only one possible. On the other hand, I am confident that there are solid grounds to justify my interpretation as a viable one. In his *Insights and illusions of philosophy*, for example, Piaget says:

> What is important is the trilogy *reflection x deduction x experiment*, the first term representing the heuristic function and the other two cognitive verification, which is alone constitutive of "truth."[9] (Emphasis added.)

If we remember that experiments are, after all, nothing but controlled experience, the passage clearly states that, in order to be considered "truth", the products of reflection and deduction must prove viable in the realm of our experience. And for something to prove

viable does not mean that it has to match an ontic world, but that it fits into it without causing perturbations.

In my view, Piaget should have repeated this definition of truth in every book he wrote. The fact that he did not, allows many readers to think that he uses the term in the sense of the philosophical tradition, that is, as entailing a representation of "reality." This source of misunderstandings is aggravated by his frequent use of the word "representation."

If one takes seriously the fundamental assertion that knowing is an adaptive function, it is clear that no product of the cognitive activity will be a representation of whatever the cognizing subject is adapting to. The results of adaptation will have to fit into the world, not to copy it. Piaget uses the word "representation" for what Kant called *Vorstellung*, which is much closer to "idea" or "conception." Confusion arises because "representation", both in French and in English, designates a picture or copy of something else that is considered the original. But the products of the cognitive activity are the constructs of the cognitive activity and not represented images of an inaccessible original.

Piaget's Genetic Epistemology, from my point of view, constitutes a continuation and expansion of Kant's transcendental enterprise, that is, "the idea of a science whose internal architecture is to be designed entirely on principles derived from the critique of pure reason..."[10] Piaget remained true to Kant's (and also Vico's and Berkeley's) axiom "that reason can see only what she herself has brought forth according to her design."[11] But he goes beyond Kant, in that he was able to show that much of what Kant had to assume as given a priori could be explained by a developmental analysis of the cognizing subject's mental operations.

The Core of Radical Constructivism

The key ideas of this post-epistemological approach to the questions what is knowledge and how do we come to have it, can be summarized as follows:

1. What we call "knowledge" does not and could not represent a world that is supposed to be beyond our experiential interface with it. In this, constructivism agrees with the sceptics. But, like pragmatism, constructivism introduces a modified concept of knowledge. Knowledge pertains to the way in which we organize the world of our experience.

2. Radical constructivism does not deny an ulterior reality; it follows Vico in that it denies that human rational knowledge can attain a God-made world or produce anything that could rightly be called a representation of it.

3. It agrees with Berkeley that it is unintelligible to attribute existence to anything that cannot or could not at some time be perceived, because, as he said, "there is no rational evidence for the existence of an independent reality."[12]

4. It takes from Vico the basic idea that human knowledge is a human construction, an idea which Piaget – who, I believe, did not know the Neapolitan philosopher – developed very much further by minutely mapping the constructive conceptual operations by means of which human subjects furnish their experiential worlds.

5. Constructivism drops the requirement that knowledge be "true" in the sense that it matches an objective reality. All it requires of knowledge is that it be viable, in that it fits into the world of the knower's experience.

6. Inherent in radical constructivism is the realization that no knowledge can claim uniqueness. In other words, no matter how viable the solution to a problem might be, it can never be regarded as the only possible solution.

7. This last consideration, together with Leo Apostel's admonition that "a system should always be applied to itself,"[13] leads to the conclusion that radical constructivism cannot claim to be anything but one approach to the age-old problem of knowing. Only its application in contexts where a theory of knowing makes a difference can show whether or not it is a viable approach.

Conclusion

Radical constructivism relinquishes the venerable image of the human knower as a discoverer whose task is to find the truth about a world into which he comes as an objective observer. This is sufficient to make this theory of knowing unpopular. Human self-esteem was profoundly shaken when Copernicus suggested that the human planet was not the center of the universe. Now to be asked to give up the hope that human knowledge will eventually produce a true representation of that universe posited beyond the realm of experience, seems unacceptable, no matter how logical the arguments may be. Although everyone realizes at some juncture that life and the universe in which it has unfolded are ultimately an impenetrable mystery, few are inclined to accept the consequences of that realization for their rational efforts.

The constructivist approach to knowing is an attempt to safeguard reason from two equally pernicious fallacies. On the one hand, it counters the sceptics who have forever disparaged reason by demonstrating that it cannot lead to certain knowledge about the real world and thus, with or without intention, prepared the way for some irrationalism; on the other, it counters those (and there are many among them who call themselves scientists) who claim to have found the truth.

In my view, however, the constructivist orientation comprises far more than the critique of the traditional presupposition that objective knowledge is not only possible but also necessary. Once one accepts the view that all knowledge is a cognizing subject's construction, that subject regains such autonomy as it can find within the constraints of an unknowable world. And with autonomy comes responsibility. What we know, largely determines how we act. Consequently, if we want to act responsibly, we shall have to take responsibility also for the way we see the world.

Those who propound constructivist ideas must expect criticism and sometimes even animosity. And among the critics there are usually some who react in the same way as the anonymous reviewer of Vico's treatise at the beginning of the 18th century: They demand proof that the propounded thesis is true. Thus they miss the central point of this post-epistemological way of thinking. Radical constructivism does not claim to be anything but a model, that is, a construct whose value depends exclusively on its viability. In other words, it will sink or swim according to whether it manages to establish and maintain equilibrium in the sphere of rational cognition.

Postscript

In these pages I have simplified – perhaps oversimplified – the points of view of the three thinkers that I cited as relevant to radical constructivism. As a mitigating circumstance, I might say that if I had tried to consider each one's entire work, rather than a few brief statements, I would have had to write a book. This is not an excuse. Rather, I would maintain that the three thinkers had long working lives in the course of which, as their most knowledgeable students agree, they changed some of their ideas. It was not my purpose to produce a comprehensive account of how they developed their views. Piaget made clear that no matter how we try to accommodate to the view of others, we cannot help assimilating what we experience to our own conceptual structures. Hence, it should be taken for granted that my interpretation of the authors I have cited does not purport to be "objective" but is a frank assimilation to my own way of thinking.

Footnotes

1. Giambattista Vico, De antiquissima Italorum sapientia, 1710, Ch.7, §III.
2. Vico, loc.cit., §IV.
3. George Berkeley, A treatise concerning the principles of human understanding, 1710, Part I, §3.
4. George Berkeley, Alciphron or the minute philosopher (1755). In A. A. Luce & T. E. Jessop (Eds.), The works of George Berkeley, London: Nelson, 1950; p.170.
5. Jean Piaget, La construction du reel chez l'enfant. Neuchatel: Delachaux et Niestle, 1937; p.311.
6. Jean Piaget, in B. Inhelder, R. Garcia, & J. Voneche (Eds.), Epistemologie genetique et equilibration, Neuchatel: Delachaux et Niestle, 1977; p.14.
7. Berkeley, Treatise, Part I, §6.
8. Berkeley, Alciphron, p.304.
9. Jean Piaget, Insights and illusions of philosophy. New York: Meridian Books, 1971; p.232.
10. Immanuel Kant, Kritik der reinen Vernunft, 1787; B 27.
11. Kant, loc.cit., B XI.
12. Richard Popkin, Berkeley and Pyrrhonism, The Review of Metaphysics, 1951, 5(2); p.230.
13. Leo Apostel, in B. Inhelder, R. Garcia, & J. Voneche (Eds.), Epistemologie genetique et equilibration. Neuchatel: Delachaux et Niestle, 1977; p.61.