

IS REALITY VEILED?

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When I swat a fly, it is clear that I do not kill the thing-in-itself but only its phenomenon.

SCHOPENHAUER'S COMMENT ON KANT

1. Introduction

The Sophists were the first thinkers to have a clear idea of the subject's influence on knowledge: they discovered that knowledge was mind-dependent. The sentence that man is the measure of all things means that relativism and scepticism was the first conclusion of that discovery. Our situation is not very different from Protagoras' time, a proof that in philosophy the great problems and their possible solutions—or better, the way to deal with them—are very few.

Once we realize that the mind (or the organism) plays a role in the knowledge of things, the idea of the existence of an objective, man-independent world, yet knowable, becomes a problem; it is indeed one of the major problems of science and philosophy. The human participation in knowledge has been metaphorically described as a veil covering reality. After the Sophists, the veiled-reality thesis has been renewed by Hume, Bacon, Kant, Duhem, and closer to us in time, by Bernard d'Espagnat, Hilary Putnam, Thomas Kuhn, and Paul Feyerabend.

It has to be said at the outset that some important differences in subject matter and point of view separate our contemporaries just mentioned. D'Espagnat's main interest is the philosophy of nature, Putnam's, the philosophy of mind, Kuhn's, the history of scientific knowledge, Feyerabend's, the critique of the scientific methodology. Neither d'Espagnat nor Putnam would willingly class themselves as

relativists or anarchists. Nevertheless, there are in their work some striking similarities which justify their reunion, the main common thesis being that for all of them, reality is veiled by perception and language.

2. The "veiled reality" metaphor

Let us take a look at the metaphor. A veil is not a wall; a wall is a definite division of space, natural or artificial; it is an obstacle to the exercise of some of our capacities like movement, touch, and sight, and we can know next to nothing about what there is beyond the wall (of course, we can always propose some conjectures). On the other hand, a veil is exclusively an obstacle to sight. To prevent people from seeing them, some women put a veil on their faces, statues are veiled before their inauguration. Although a veil can also be natural (as the veil of clouds covering a volcano), it suggests, more than a wall does, the hand of man, that is, his will. A veil suggests a temporary covering of something. So at a given moment, a man uncovers the statue, the woman unveils her face. Even the volcano is not always wrapped in clouds. A veiled object can be touched, smelled, and if the veil happens to be close to the surface of the object, we can even guess its form, and eventually, its nature.

The veiled reality metaphor means that there is a reality-in-itself. That is why sometimes the doctrine that reality is veiled is considered — misleadingly— as a kind of realism. (Misleadingly, because often people go on to postulate that the order of things, their intelligibility, come from us, which is actually a token of idealism). It is not asserted that behind man's active participation in knowledge through sensation, perception, and thought, there is nothing, that man creates the world. There is a world independent from man.

To repeat with Protagoras that man is the measure of all things is not to say that the whole of reality is man-made. By observing, with Hume, that the mind has a great propensity to spread itself on external objects, we are recognizing the existence of external objects. To say that categories are applicable only to the world of phenomena is not to say that behind the phenomenon there is no noumenon (Kant). The remark that the observation of physical phenomena does not put us in touch with the reality hidden behind the sensible qualities does not imply the inexistence of such reality (Duhem).

If science is the description of the phenomenal world, and if in doing this we have discovered that we cannot separate man from extra-human nature—that is supposed to be one of the main lessons of the quantum-mechanical discovery of non-locality or non-separability—it does not follow that we never get the impression that we have touched reality, or that no other human activity like art or religion, has any chance of getting in touch with it (B. d'Espagnat). Nor is the incredible belief that the universe is man-made or man-dreamt implied by the thesis that ontology makes sense only within a given paradigm or theory (Kuhn, Feyerabend, Putnam).

In what follows, I discuss three contemporary versions of the idea that reality is veiled: B. d'Espagnat's philosophical lesson drawn from the discovery of non-separability or non-locality, Kuhn's and Feyerabend's thesis of the incommensurability of concepts, theories or paradigms, and Putnam's internalism.

3. Non-separability

B. d'Espagnat, in a way quite untypical of most contemporary scientists, and renewing the French tradition in the philosophy of nature, has done philosophers a service by making fully explicit the philosophical consequences of one of the main results of quantum mechanics, the discovery of non-separability. He has extended his scientific work by a series of comments on some recent views on the nature of science and its relations with philosophy, giving us an inside look at the way actual science works (as opposed to the science of epistemologists). What I will say here does not concern his entire work but only some of the main points directly connected with his main philosophical thesis that reality is veiled.

An idealist feature of positivism is the identification of reality-in-itself with our experience of it. According to positivism, all there is is phenomena and the measurable relations between them. D'Espagnat is well aware of the fact that the positivist and instrumentalist attitude is unsatisfactory because it leaves in us a gap in the understanding of reality: it would be much too anthropocentric to believe that behind phenomena there is nothing. The person as person, if not as scientist, tries to fill such a gap.

According to d'Espagnat, the best way to reason is the scientific approach which consists in going gradually from the most simple,

concrete, and empirical, to the more complex, abstract, and theoretical, while avoiding as carefully as possible the assertions not duly justified, and eliminating in passing the hypotheses refuted by the facts discovered. Most scientists agree with this way of conceiving reasoning. "My analyses", said Mach, "begin always with details belonging to physics, and then they go up towards more general considerations."

One of the clearest illustrations of this procedure are the writings of Galileo, a paradigm of the scientific spirit. Let us not hide the following evidence: d'Espagnat's and Mach's observation is a way of describing and defending the scientific (= experimental) way of reasoning, and of showing eventually (that is, every time that philosophy gives itself the same object), the superiority of science over philosophy.

This kind of procedure has given us today's most widely accepted interpretation of quantum mechanics, the Copenhagen version. In a word: there is no place for some deterministic supplementary variables hidden behind the manifest probability of observable elements. From the knowledge of the wave function at a given time, only some probabilistic information can be obtained. This theory —so the specialist tells us— has passed all the tests set for it in laboratory. It is a satisfactory description of observable or detectable phenomena. Since it is a theory as well confirmed as a theory can be, the physicist does not see why —in virtue of what— one would not accept its results and its philosophical implications.

Among the quantum-mechanical discoveries there is non-separability or non-locality, the idea that two objects, for instance, two correlated electrons (having the same associated wave) continue to influence each other after separation. (As everybody knows, Einstein made fun of this curious situation by calling it a case of telepathy). In other words, where we thought that there were two systems, there is actually only one.

Let us suppose that two electrons are sent in two different directions and each one of them received in two independent apparatus capable of registering the direction of their spins. It is possible to calculate the probability of finding that their spins have either the same sense or opposed senses. The John Bell's theorem of 1964 shows that the results calculated according to the orthodox interpretation (the electrons stay connected) are incompatible with the results obtained by means of the rival interpretation where it is assumed that once the two electrons are separated, they are no longer connected and each one of them is localized in a different associated wave. It is the orthodox interpretation

of quantum mechanics which has been verified because physicists have discovered non-separability.

One of the main consequences of non-separability, in conjunction with some other ideas constituting the orthodox interpretation of quantum mechanics, is the impossibility of performing an act of measurement without perturbing the object measured. This remark undermines one of the scientific criteria proposed to know when we get in touch with reality-in-itself. According to Einstein, Podolski and Rosen, "If, without in any way disturbing a system, we can predict with certainty (i.e., with probability equal to unity) the value of a physical quantity, then there exists an element of physical reality corresponding to this physical quantity".

If any object ends up sooner or later by interacting with other objects, it is reasonable to think that men and extra-human objects end up by forming a totality. "Everything is in everything and absolute separation is impossible... Nothing could exist in an absolutely separate manner and lead an independent existence." (Anaxagoras). The idea of a reality-in-itself, immersed in a man-independent space-time *continuum* ("nearby reality") becomes implausible. The physicist then goes on to embrace the doctrine that reality is veiled or faraway. One begins to see how their own researches have led Bohr and d'Espagnat to approach the Kantian theme of the conditions of knowledge, the main result being that the noumenal world is unknowable.

If non-separability is a real phenomenon, it is another indication that only a weak objectivity is possible, that is, intersubjectivity, the kind of objectivity which necessarily refers to the community of people. It is not an agreement, consciously sought, concerning technical or difficult points. The appeal to the community of men includes such simple procedures as agreement on the fact that a signal is green or red, on the fact that a light is on or off. D'Espagnat reminds us that, according to Bohr, an assertion is objective if it is valid for any normal observer. Strong objectivity, the community-independent access to reality-in-itself (the divine point of view) has not in this context an easy life. There are non-standard models where things are more favorable to strong objectivity, but they do not seem to be justified by the tests imagined for quantum mechanics.

Of course, to say that only weak objectivity is possible (that is, objectivity within a given paradigm, theory, or social group—internal or local objectivity) does not mean that a sentence is true because it is

believed by the majority of a given scientific community: weak objectivity is logically independent of what is believed by the majority (a weak objectivist or internalist would not be willing to abandon his doctrine because it is rejected by the majority). In other words, local objectivity is compatible with global subjectivity. The logical independence of truth from the belief of the majority does not transform weak objectivity (local objectivity) into a strong one because verification occurs within the phenomenal world (global subjectivity).

The criterion of invariability seems to be respected: a sentence is true, it reveals a feature of the world, if it remains identical through the evolution of theories, points of view, and ways of verification. But the world alluded to is the phenomenological world, a reality constituted (organized) by our way of seeing, not reality-in-itself. Object, says d'Espagnat, is not being.

Quantum mechanics functions, according to d'Espagnat's image, like a handbook for car-driving: it is not a description of the way the engine works. Anyone who steps on the accelerator, will feel an acceleration. The handbook does not fail. Quantum mechanics is "a recipe which works" (P. Valéry).

Here is, once more and in a nutshell, d'Espagnat's thesis: aware that there are long lasting rival theories aiming at describing reality in-itself (physicists seem to agree that, as far as the description of the empirical world of phenomena, quantum mechanics has no rival), he thinks that it is useless to ask of them to describe anything beyond phenomena. That is why, he argues, it is likely that reality-in-itself is not scientifically knowable, that is, in a way which is both certain and unambiguous. The proper object of science is thus empirical reality only directly or indirectly described by statement endowed with weak objectivity. This remark adds weight to the ancient relativistic and anti-realistic belief that it is hopeless to wait for a unified meta-theory that would be the final description of a unique reality-in-itself.

The global suggestion made by d'Espagnat is that there are some reasons, some facts, some a posteriori evidences which invite us to believe that there is not an ultimate reality, knowable yet independent of the human way of perceiving and thinking. Such a reality is veiled. It does not follow that it does not exist: d'Espagnat has criticized positivists and empiricists for thinking so. The philosophical lesson of quantum mechanics is epistemological, not ontological.

Reality, epistemologically veiled, can be touched, it is not absolutely beyond our capacities. Let us notice, in passing, that this means a difference between d'Espagnat and Kant since for the latter, reality-in-itself is absolutely unknowable. According to d'Espagnat, once in a while the scientist gets the impression that he has grasped reality-in-itself, a part of its structure. But reality veils her face, so the scientist has a difficult time in trying to say what is the part of reality he believes to have seen. D'Espagnat draws a lesson of modesty and tolerance: maybe this feeling of having touched reality is also present in other people having devoted their lives to non-scientific endeavors. After all, science does not pretend to exhaust the aspects of reality. Science has often been partially defined (by scientists themselves) as the description of phenomena.

4. Object is part of being

The non-specialist feels uneasy while speaking about things he does not know from first hand; the situation becomes more confusing when the professionals of a given theory do not agree about the facts established, nor about the right or more plausible interpretation of them. It is very uncomfortable for me to comment on the supposed evidences coming from quantum mechanics. On the other hand, I do not see how one can deal with the problem of the knowability of an independent reality without mentioning what scientists have to say about it according to their best knowledge. My comments on the results of quantum mechanics are thus external.

Let us notice that here reality is conceived as that which exists beyond sense impression. One of the first things to say then is that there is no need to see reality that way: man, and what goes inside him (with the exception of what exists only intentionally, within language) is also real; his sense impressions, sensations, and perceptions are real. Is real what is in both sides, so to speak, of sense impression. The real photons or waves which exist beyond sense impression come into the organism. Color vision is the set of those photons or waves in the organism. Thus, those real events, that is, those physical changes in the state of something, are not the cause of sensation, if by cause we mean that which exists exclusively before the effect: they are the substance of sensation. Color vision is the existence of those physical entities in the organism. The same can be said concerning the other kinds of sensation. This assertion is not refuted by the observation that different sets of

physical properties can be integrated in the vision of (roughly) the same color: a blue ocean and a blue sky are blue for different physical properties.

If, as I suggest, the real, physical events are not transformed when they come into the organism, if they are not just the cause which disappears after they produce the effect in the organism, it follows that the events entering into the composition of the thing in the intellect, in the object, as well as those parts of the state of the organism or of the central nervous system which do not exist only intentionally, are real parts of being. The problem then is not to go out to reach things as they are since we are part of reality, or, if you wish, reality in the form of physical events existing on the one or the other side of sensation, goes necessarily through us. Reality is not exclusively a special area of the universe, that area which exists beyond the reach of our senses.

Let us hope that some day neurophysiologists will be able to propose a theory of sensation in accord with the ideas expressed in this essay. This "dream" is more coherent and reasonable than the idealistic attitude which consists in assuming that we have absolutely no reason to think that there is in sensation a privileged contact with extra-human physical reality, an attitude extended by the dogma that even sensation is a human creation. My "wishful thinking" is also more reasonable than the assumption that scientific information has no bearing in philosophical discussions.

If quantum mechanics shows in detail what the ancients and the medievals felt, that man is part of nature, then, from a philosophical point of view, the idea of totality is not new. Let us willingly acknowledge that man and nature are ontologically tied, that they form a whole. In this sense, what quantum mechanics shows —non-separability— should not surprise us. On the contrary, what would really be strange and unbelievable, would be the demonstration that man and nature do not form an ontological whole.

I think that d'Espagnat traces too sharp a distinction between science and non-science, and between phenomena and reality-in-itself. Why should science be just the description of phenomena? Why should reasoning from bottom to top be preferable to beginning from the other end? Much of what d'Espagnat says follows logically from this conception of science and this conception of the best reasoning. On the contrary, if the aim of science is the search for intelligibility, and if intelligibility is not equivalent to the result of empirical research, one sees how

considerations other than those tied to reasoning from bottom to top may be pertinent. If intelligibility has also a metaphysical side, and if we associate this aspect to the summit of the intellectual process, reasoning from top to bottom looks as legitimate as the other way. In other words, if science and metaphysics do form one conceptual system, there is no reason to trace a sharp boundary between phenomena and noumena.

I conceive metaphysics as the rational antecedent and extension of science, the search for intelligibility and meaning beyond the observable. 'Metaphysics' does not mean 'ultra-physics' or 'trans-physics'. Everything is physical—which does not mean that everything is material since there is also the region of form; the physical universe has also a mathematical dimension. Thus metaphysics is the science of the physical properties of the universe which are beyond our power of detection.

How can we know that we have touched reality-in-itself? When we obtain the same results no matter how we investigate phenomena. Identity is a reliable criterion of reality. If quantum mechanics has been confirmed again and again, its value is more than conceptual coherence: it goes beyond theoretical harmony to touch reality. There are two opposite ways of understanding the role of quantum mechanics: according to the orthodox interpretation, it makes it impossible for us to know things as they are. According to another interpretation, in agreement with the idea that the highest objective of science is precisely to discover how things are even beyond the reach of our senses, it could be said that this theory allows us to have an understanding even of those phenomena which are far from adjusting themselves to our way of seeing and thinking.

If this criterion of identity, of multiple verification, is not a criterion of reality, I do not see how any other criterion would succeed. It is the business of each theory or science to specify its criteria for identity according to its own nature.

What has been said is applicable to Kantianism: Kant has sharply separated phenomena from noumena, science from metaphysics. It is not surprising that some people go on to deny the world of noumena: if it is absolutely unknowable, we cannot say anything about it, we are not even entitled to say that it exists. This shows the difficulty to acknowledge the existence of something about which we do not know anything. We have seen that d'Espagnat, conscious of the difficulty, does not want to commit himself to the view that reality is absolutely unknowable, and he sees in this a difference between his thought and

Kant's. But I do not think his reaction does away with the feeling of uneasiness awakened by the recognition that sometimes the scientist believes to have touched reality, although he is unable to say exactly what he has touched.

The picture one gets from d'Espagnat's thesis is not reassuring, and the natural and authentic feeling of uneasiness just mentioned is a clear sign that, if definitive, such an evaluation cannot be right. It is as if man were surrounded by shadowy figures, like those of Plato's allegory, living in a world devoid of substance and light. Let us abandon the idea that reality is distant or veiled, and let us render the world its substance and light. We will see that some intellectually articulated reasons can clarify the intuition that we can do better than hold that reality is veiled. (We will come back to the criticism of this thesis).

Before taking leave of this section, it is pertinent to point out that physicists have a tendency to distinguish neatly between reality extensively conceived as the set of subject-independent physical objects on the one side, and a subjective or intersubjective world, the world of perception, on the other. The subjective world seems to be here a cellar where the physicist throws everything he cannot or does not want to use.

But much of what is called subjective, as opposed to real, is in fact physically real, not in the sense that it is independent from the organism, or in the contemporary physical sense in which elementary particles are real, but in the sense in which a quality such as color becomes actual when an organism comes in touch with an organism-independent thing. For instance, since sensible qualities are physically real within perception, they are not subjective and should be dealt with by the physicist. (I guess it was something like this that R. Feynman had in mind when he thought there was no obstacle in principle for the physicist to do research in physiological psychology).

In a word, we can say that everything is physical if 'physics' is taken in the ancient Greek sense according to which the physical is approximatively what is objectively real; the physical includes the biological and psychological dimensions of organisms. Furthermore, we can say that something is real-in-itself not only if it exists beyond our reach but if the thing in question does not exist in an intentional manner as imaginary beings do. Knowledge of what is given in man's perception is knowledge of a reality-in-itself.

5. Incommensurability or progress?

It is the search for a unitary explanation based on the belief that there is, in the end, one truth belonging to the one world there is, which is unacceptable in Feyerabend's eyes. According to the objectivist, knowledge progresses towards more unity of explanation. But progress, says the relativist, is far from evident.

One of the main, rather implicit, ideas held by Feyerabend is that each person, being anchored in nature and in one particular society, has a reduced capacity for learning, which sets some limits to the accumulation of knowledge. That is why the truth of an assertion such as "of course, today we know more about the world than the Greeks" is not easy to grant. It depends on what we mean by *we*. We can venture to affirm that about the world *in general*, Aristotle knew more than any of our contemporaries. Furthermore, the great amount of knowledge *we* have is not *in us* but stored in archives, libraries, and so on. Heidegger used to have a pessimistic idea on truth similar to it: when we discover something, as when we make a hole in the ground, we cover something else by throwing the dirt around the hole. Part of the interest of relativism is that it reminds us that we are limited creatures. The belief in a unique truth is a mistake: man is not god.

The thesis that paradigms, ideologies, theories, and languages are closed systems has been recently stated by people like Kuhn and Feyerabend, more sensitive to the evolution of ideas and to the multiplicity of rival conceptual systems than to the empirical, logical, or structural dimensions of knowledge. We can compare a concept to another provided they share the same framework. Clearly, then, the relativist is an idealist: he starts out from the subjective side as if at the beginning there is language and culture which manufacture the world.

One way of outlining the relativist's thesis is the following: The meaning of important, central concepts can change. When that happens, there may be a change of theory, and, as a consequence, a change of perception and finally even a change of world. It is supposed that when a concept changes its meaning, the ancient and the new one become incommensurable, logically and empirically incomparable, because they do not have any longer either the same sense or the same referent. It is also asserted that there is no theory-independent observation or description of facts. (It is no wonder that Feyerabend is receptive to Bacon's comment that language does not limit its action to the

description of external facts: it shapes them). Among the main presuppositions of this view there is the contention that language is an activity more arbitrary and conventional than necessary and natural, that language can be disengaged from reality.

To say that the meaning of concepts may change to the point of becoming incomparable, and that with them our perception and even our world change, is an exaggeration and a mistake which has the merit of calling our attention to a fact easily forgotten by naïve realists and materialists: the world we live in is intentional, tied to human dimensions and interpretations. Who can believe that artists and thinkers on the one side, and military men on the other, take part in the same world? The National Stadium of Santiago (Chile) is not the same object for the young spectator, the tourist, and those who were imprisoned in it. A change of dimension (aesthetic, moral, economic, sexual, etc.) changes the meaning of the object.

Let us consider the passage from classical physics (CP) to quantum physics (QP). Specialists are not unanimous in answering to the following questions: Is QP an extension of CP? Is CP a limit of QP? Is CP a part of QP? If there is disagreement on the answer to these pressing questions, how can we be certain if, and to what extent, they are comparable? Let us take a look at Bunge's conclusions, based on the axiomatization of QP: a modified part of CP can be deduced from QP. CP has played an instrumental, heuristic role in the construction of QP. Even if CP is not a part of QP, CP is needed to test QP. We have here an illustration of the complexity of the incommensurability problem.

Any two concepts, e.g. Aristotle's and Galileo's motion, where one has evolved from the other, or formed in contrast with the other, if they are authentic rivals (as they are since nothing of Aristotelian physics remains in contemporary physics) then they are comparable. (By the way, one would have a hard time to find other examples of a theory so radically substituted by another theory). To know that two or more theories or visions of the world are different, comparable or incomparable, one has to understand them. We have touched here on an idea for a tale *à la Borges*: how is it that relativists, who think that there are different worlds, run through by different rationalities, get to expose and understand different worldviews and theories? The thesis of incommensurability is self-contradictory or self-refuting, as Putnam has said.

Feyerabend has reacted to Putnam's critique by observing that it contains two false assumptions: 1° that to understand foreign concepts we have to translate them; 2° that a successful translation does not transform the language into which the translation is made. Feyerabend argues, on the contrary, that the understanding of foreign concepts implies invention and learning rather than translation. In the process of learning, it is not unusual that concepts be transformed. Therefore, a new theory which includes an ancient theory does not necessarily save its meaning. It seems to me that this way of speaking suggests a reasonable weakening of the incommensurability thesis.

According to my conception of meaning, this is a complex entity, a function of the objective properties of the referent, of the properties of a system of symbols (the way a system of symbol organizes its content, generates its structures), and of the set of the interpreter's mind (attitude, cultural preparation, personal talent, etc.). In order to contend that a meaning has changed, one has to specify its elements and show which ones are different and which ones remain the same. A world where a process of change annihilates what existed before and creates something from nothing, is not ours. That is why Kuhn gives a step forward and a step backwards concerning his thesis that different paradigms literally build different worlds.

The observation that in change something remains the same, in conjunction with the idea that meaning is a complex entity, induces us to recognize that the illustration of the change of meaning proposed by both Kuhn and Feyerabend based on the perception of ambiguous figures like the head-of-rabbit / head-of-duck drawing does not work: these figures are far from deploying the complexity of the meaning of a concept or theory. Furthermore, in the case of ambiguous figures, there is one set of lines (an objective geometry) which remains the same through the different readings.

Granting that concepts, theories, paradigms, and ideologies play an active role in partially shaping our experience of the world, it has to be said that idealists and relativists are shortsighted because they do not see where concepts come from. What we witness in Kuhn's and Feyerabend's writings is one more example of my suggestion that one of the main premises of non-realists is that language —and, therefore, everything possible thanks to language, for instance, the human way of being in the world— is more arbitrary and conventional than natural. (By "natural" I mean in this context, although not exclusively: obeying to man's instinct

or tendency to survive.) We will come back to this common feature of non-realists after revision of some of Putnam's ideas.

The belief in an external world, independent from the subject who perceives it, constitutes the basis for all science of nature. That was Einstein's way of describing realism. Some other principles can be associated to this basis, logically dependent or independent from it. Some version or other of the correspondence theory of truth is logically tied to it, while the belief in an external reality does not imply, nor is it implied by, the assertion that such a reality is fixed, or that at a given moment there has to be only one theory which completely describes that independent reality. The exhaustive analysis of externalism would include a discussion of all the theses associated to externalism. Since I am discussing the idea that reality may be veiled, I concentrate mainly on the condition mentioned by Einstein.

I believe, for my part, that we must reject Einstein's condition: the internal / external opposition is the kind of dichotomic metaphor capable of suggesting the mutual exclusion of two substances (mind and matter, mind and extension, the human and the natural) that nourishes the endless parade of idealist arguments irrelevant and boring more often than not. If knowledge and truth means useful communication between man and his environment, useful communication becomes impossible if we postulate, at the outset, that the parts to enter in communication are separated. On the other hand, if we postulate that the world exists only within the word, the impossibility of truth as correspondence becomes evident.

There is absolutely no better way for the realist to cut the idealist's inspiration than to recognize a very simple natural fact: that the word is within the world, the intellect within reality, man within nature. That is why the lesson of non-separability, an argument against the kind of scientific realism embraced by Einstein, leaves untouched metaphysical or natural realism. There is no reality external to mind because the mind is in the external reality. If you wish: all there is is external reality.

It follows that the arguments against correspondence (where Putnam and others have spent much of their energy and ingenuity) touch only a superficial aspect of realism since the adequation between language and the world is underlain by a deeper ontological tie. In other words, the problems of correspondence (local or specific adequation between sentences or theories and facts) can be treated independently of metaphysical realism where a global adequation is assured by the fact

that man is a natural being. With these ideas in mind, let us take a look at some of Putnam's.

6. Internalism

One way Putnam has characterized his internalism or internal realism—which is actually a linguistic idealism and a conceptual relativism—runs: The question: “what objects make up the the world” makes sense only within a given theory or description. Our access to external objects is mediated through images, beliefs, judgments, etc. We do not have a description-independent access to raw experience or to the given of experience. We cannot treat understanding a sentence as knowing its truth conditions: since there is no psychologically free access to external objects, we cannot have a presuppositionless knowledge of truth conditions.

Why realism then? Because unless we prefer miracles, we have to recognize the existence of the entities postulated by our best or most successful descriptions put forward by common sense or by science. There are tables and trees and fields and particles. The idealism inscribed here is evident when there is ontological disagreement among our best description: the internalist has only a conventional way of making a decision since for him there is no fact of the matter.

Objects are given to us through experience, but in order for us to be conscious of an experience, we have to conceptualize it. Conceptualization may occur in terms of common sense concepts or in terms of scientific concepts. Thus a conscious experience, that is, an experience which means something to us, is constituted by our description. In conscious experience, we cannot neatly separate what belongs to the object itself from what belongs to our description of it.

This reminds us of what Bohr calls “the existence of the quantum of action”: in an experimental arrangement, we cannot neatly disentangle the measuring apparatus and the quantum object. Yet, from a realist point of view (not Putnam's), the fact has to be insisted on that, no matter how difficult it is to disentangle the thing-in-itself from our description of it, the distinction is real. Otherwise, the incredible conclusion will follow, that objects are created, invented or constructed, as we begin to be conscious of our experience: the internal object is not identical with the thing-in-itself; a real object is not an ideal entity.

It is pertinent to point out, once more, that the human organism, as any organism, is run through by physical entities or events such as photons or waves, and that the presence of these real, physical events in us is a sense impression or a sensation which is, of course, as physical as the organism, photons or waves. In this kind of physical, biological and psychological experience, the constitutive role of language, if it has one, can be neglected. In other words, the language used to describe this kind of experience is universal and its role is reduced to note or record a fact. Such is, by the way, the aim of science: to apprehend nature's intelligibility, to describe things as they are by using a universal language, and no system of symbols fulfills the requirement of universality better than mathematics.

Ontology, says the internalist, depends on concepts. Reality is veiled by concepts. How many objects are there in the world? (Strange question). Kant has been there: the notion of "one object" or "one entity" is not natural. The organization of reality in unities depends on what we mean by object or entity. We are asked to recall that meaning is use (Wittgenstein), and that the rules of formal logic do not uniquely determine the interpretation of logical connectives (Carnap).

Of course, the unity of some entities is less conventional than that of other entities. The unity of an ant is less conventional than the unity of a car. Putnam does not want to say that concerning the unity of something, everything is conventional. His reasonable point is that fact and convention form a continuum. It is then impossible to trace a sharp boundary between them. Some questions are addressed to the more natural part, others, to the more conventional. The disagreement lies in the distribution: while Putnam is interested in according the largest possible part to convention (to keep things within his internalism), I think, on the contrary, that we should try to do our best to reduce as much as possible the conventional and recover what is natural and necessary in our categories (to keep things within realist metaphysics).

Truth, for an internalist, cannot be the correspondence of our sentences with states of an independent world. Truth becomes a kind of idealized rational acceptability, an idealized object comparable to the idealized physical objects of physics which are useful fictions for the understanding of real physical events. In the hands of the internalist, these notions, truth and idealized rational acceptability, become interdependent. This observation is insufficient to found a theory of truth.

Actually, —what follows is only an observation, not a reproach— Putnam does not have a satisfactory theory of truth to offer.

Nor does he have a satisfactory theory of reason. His conclusion is that if reason is a problem, it does not have a solution. Modifying Neurath's picture according to which science is a boat people have to reconstruct to keep it floating, Putnam views rationality not as a boat but rather as a fleet where the various cultural activities are represented. The destiny of their occupants is to help each other; without it, there is no survival, boats may sink. These observations are pertinent, the suggestion deserves to be elaborated, but the problem of rationality within a non-realist frame is not my problem here.

Truth, for an internalist, is coherence, not correspondence. This distrustful glance over the capacity of concepts to describe things as they are in themselves differs typically from the optimism of those who, like Einstein, are convinced that even if it is true that perception can give us only an indirect or veiled grasp of reality, we can trust our conceptual capacity of understanding the external world.

The externalist may think that nature is ruled by a unique and coherent set of laws and that our representation of it has to enjoy the same properties. Now Putnam observes that according to a strong version of the Skolem-Löwenheim theorem, if T is any set of first order expressions satisfied by an infinite model, then it is also satisfied by models of any transfinite cardinality. Two models with different cardinality cannot be isomorphic. Among the philosophical lessons we can draw from this theorem, it is mentioned that the constraints imposed by a formalism to its objects are determined not only by that formalism, but also by the interpretation assigned to symbols beforehand. That would be one of the ways in which relativity (absence of unique discourse with unique reference) enters the system. Possibility of interpretation means, in part, possibility of convention. Putnam concludes that a formal system cannot represent reality as such —as externalism would have it— but our way, historically determined, of thinking about reality.

Ian Hacking has rightly commented that the technical argument based on the Skolem-Löwenheim argument presented by Putnam, concerns first-order expressions. Now neither natural language nor the scientific discourse can be totally and satisfactorily reduced to first-order expressions. Thus Putnam's point concerns only a part of natural or scientific language.

Putnam is sensitive to Kant's teachings concerning the impossibility of our getting to know reality-in-itself because phenomena are constituted by a priori elements. Furthermore, he reminds us that psychology shows some limits to what we can compare: we can set side by side several images, or several words, or several sentences, but we cannot compare symbols with external facts. Symbols form closed systems.

During the last ten years, Putnam has acted rather as a destroyer: he has argued against scientific realism, logical positivism, relativism, and functionalism, leaving the problems without solution.

7. *Natural categories*

According to Putnam, ontology is concept-dependent. There is no way out of concepts. This is a new version of an old idea: the typically human knowledge requires some system of symbols. The assertion that ontology is concept-dependent has an air of tautology: there is no human knowledge without man, no conceptual knowledge without concepts. Granted. But what is the origin of language?

When people see in conceptual or theoretic dependence an argument against realism, what they imply is that language is not as natural an activity as realists take it to be, that human categories (how we see and think) are more conventional than necessary. It follows that a way of reconquering the territory occupied by idealists is to restore the necessary biological and physical origin of language by going back to the original or natural sources of our categories, a strategy opposed to that which pays attention exclusively to the highly sophisticated development of language, that is, to the language at work, for instance, in science, literature and philosophy.

Nobody —except, of course, some analytic philosophers— believes today, as Cratylus did, that the study of words is the science of things (without qualification), and we smile at the idea that to show that language has a natural origin means to show that every word imitates a natural object or being, as some ancients believed. It is true however that at least some words were originally imitations of some real properties of things, or expressed man's spontaneous or instinctive reaction to them. Notice the physical and geometrical similarities between the utterance of the word "cave" and a cave. It has been pointed out that at the origin, language is poetical and mythical. We can imagine that Selene provoked a different æsthetic experience from the one suggested by Moon or Luna.

It is difficult not to believe that the meaning of a name is not a partial description of (or reaction to) an aspect of a thing, and so there is maybe a residue of truth in Cratylus' program after all.

Language has an empirical origin, but it is not the only one: it seems to have also an abstract or general origin. For centuries, people (among them, Adam Smith) have argued that a name is first given to a particular object, then generalized, while others (for instance, Leibniz) think that a particular object cannot receive a name unless a general idea, associated to a phonetic expression, exists beforehand. Still others (Husserl, Russell) do not see how logical truths could be obtained by empirical generalization.

The problem of the origin of language has many aspects and a long history, and we can find information and partial support for contradictory theses. As I suggested before, instead of reviewing those theses, what we need is to make plausible the idea that the fundamental categories of thought (there is some consensus among the different tables presented) have a natural origin, and reduce, as much as possible, the arbitrary or conventional parts of language.

Returning to Aristotle's approach, we realize that he was right in deriving categories from natural language because it allows us to survive. How could an animal live or learn anything if it were incapable of fixing in space and time the presence of other animals and significant objects, of transmitting vital information to its fellow creatures? That is why no table of category makes sense unless it contains substance, causality, space, and time.

Before becoming a sophisticated means for abstract thinking, language is there to communicate vital information concerning hunger, thirst, fear, search of mate. Cry, mimic, and gesture make up the first language of children. It is then reasonable to suppose with René Thom that one of the most urgent functions of language was the description and representation of processes in space and time, hence the importance of geometry for understanding the functioning of language.

René Thom points out that the main syntactic structures come from the formal structure of the major interactions of biological regulation. The biological predatory practice is a prototypical example of transitive action ("the cat eats the mouse".) The universal, for a realist, exists in extra-human nature before existing explicitly and symbolically in conceptual language. On the contrary, the nominalist tends to think that extra-human

reality is composed exclusively of particulars and that universal concepts are useful mental, fictitious devices to deal with particulars: a universal concept does not represent a universal property of nature.

The natural, Thomian approach of the origin of language views man as an organism trying to survive, like other animals. The opposite view consists in studying language from the other end, as a structured set of abstract symbols and rules. How can we imagine the beginning of human language? Man is a natural product living in a physical environment. Their relations leave marks on the organism. Now, instead of the actual marks impressed on us by animals and significant things, we place signs. Therefore, the origin of concepts is causal, and we can call this program "the causal theory of the origin of language". This suggests to me a rule for reducing the arbitrary (chosen by one person) or conventional (chosen by a group of people) elements of language:

Each time we study an element of language, let us consider it as a nearby or distant effect of the causal imprint of significative things on our organism.

If the origin of language is causal, it is not surprising that causality is one of the major natural categories, that the originality of human language lies in its capacity to express causal relations. Without language, man would be an animal whose attention would be automatically driven by any noise. Whereas an animal apprehends the properties of a thing as stimuli and only as stimuli, man, thanks to language and thought, can consciously distinguish what belongs to reality-in-itself from what belongs to his way of apprehending things given the characteristics of his receptors and of the way the information is treated by his central nervous system.

Language is a condition of objectivity. Another way of expressing this idea is to say that symbolic language introduces a distance (not a wall, not a veil) between reality and man. (This distance can be covered: it is not the distance implicit in d'Espagnat's thesis that reality is far away). Of course, the full explanation of the origin and development of human language is necessarily tied to the research in neuroscience concerning the development of this wonderful organ: the brain

The natural attitude just outlined allows us to recuperate Einstein's optimism as to the capacity of speculation to grasp things as they are. His faith or mystical mood becomes less mysterious. The idea of tensor is cognitively far from a child's cry, but then one of the advantages of

natural and formal language, is that their fixed structures and symbols can unfold themselves generating abstraction after abstraction. This is compatible with the realist hypothesis that the fundamental structures of mathematics are inscribed in pre-human nature and in the brain before they become the explicit and symbolic content of a particular science.

8. The logical-positivistic background

Science is not the only way of approaching reality, although it may be the best description of the world of phenomena. Reason is not equivalent to the "scientific method" (assuming, erroneously, that there is such a thing); other efforts could also be rational. I have mentioned d'Espagnat's suggestion that artists or religious people can experience what scientists sometimes feel: they may also have the impression of having touched things as they are. This reveals a kind of tolerance, modesty, and pluralism comparable to Putnam's image of reason as a fleet of boats. From the supposed —not definitely proved— impossibility of getting at reality-in-itself, some people have seen in it an argument for relativism or, more radically, for anarchism.

Most of the ideas developed by recent idealists (non- or anti-realists) have been provoked by logical positivistic doctrines. Idealists have reacted to the idea that empirical or scientific reality exhausts reality, that cognitive meaning or rationality has only two dimensions, the empirical and the formal. Having accepted the logical-positivistic characterization of knowledge, idealists have turned away from it too soon to propose a multiplicity of worlds and of rationalities. I propose a different strategy: first, we have to correct the logico-positivistic view of knowledge, second, let us see if it is possible to recuperate the classical belief that there is only one world run through by only one intelligibility attainable by one scientifico-metaphysical system.

9. Conclusion.

Are we justified in distinguishing neatly phenomena from noumena, science from metaphysics? I have answered: no. Granting that science deals with phenomena, do we have some criteria to know that we have touched reality-in-itself? Yes: remember the identity criterion. If human knowledge is conceptual and theoretical, can we transcend them to reach noumena? Yes: the origin of language is more natural than conventional.

Is reality composed of a fixed set of objects? Will we have, in the future, a unique, unified theory capable of explaining reality in its totality? (Stephen Hawking is quite optimistic concerning at least the unification of quantum mechanics and general relativity). Leaving aside these peripheral questions, I have shown how we can neutralize some of the main arguments for the thesis that reality is veiled.

It can be objected that instead of discussing in detail the arguments proposed by contemporary idealists, my strategy has consisted rather in changing the subject or the point of view. I have done this quite consciously. The reason is that the idealistic system is coherent, that if we grant its Kantian foundation, we remain caught in its web. The upshot is that Kantianism is not the only plausible doctrine, and that a host of sound, interesting problems can be recovered by a renewal of metaphysical realism.

I maintain that metaphysical realism, this rational extension of science whose objective is the apprehension of the intelligibility of nature, is the only coherent and full-fledged realism, while the other realisms are truncated forms of metaphysical realism, stepping stones towards metaphysical realism. But of course the conclusion of this little essay is not the place to justify such an assertion.

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