

# Science and Different Images of the World

Prof.Dr. Michele Marsonet, PhD  
Dean, School of Humanities, University of Genoa, Italy

## Abstract

It has often been claimed in contemporary philosophy that the scientific world-view will necessarily replace the view of the world provided by common sense. It may be argued, however, that common sense holds a sort of methodological primacy over the aforementioned scientific world-view. For example, the thesis of the indeterminacy of radical translation entails the impossibility of establishing what a scientific theory is talking about. We can say what a scientific theory deals with only by having recourse to our ordinary language, i.e., by assuming that we know and understand in advance what we are talking about normally, in our daily life. It follows that science cannot be conceived of as a form of knowledge which is totally independent of ordinary language and, therefore, alternative to it. According to such a stance, even scientific theories stem from the universe of meanings that belong to common language.

On his part Davidson, in challenging the scheme-content dualism, mentions both “a dualism of total scheme (or language) and uninterpreted content”, and “a dualism of conceptual scheme and empirical content”.<sup>1</sup> What we have here is a real *dichotomy* between these two elements, in the sense that the (conceptual) scheme is “other than” the (non-conceptual) content that is opposed to it. Now, Davidson’s rejection of the scheme-content distinction is supported by a set of arguments purporting to reject, first of all, the thesis that totally different conceptual schemes can actually exist. To put things in a very sketchy manner, he equates having a conceptual scheme with having a language, so that we face the following elements: (1) language as the organizing force; (2) what is organized, referred to as “experience”, “the stream of sensory experience”, and “physical evidence”; and, finally, (3) the failure of intertranslatability. It follows that “It is essential to this idea that there be something neutral and common that lies outside all schemes”.<sup>2</sup> If *this* is the situation, he goes on, then we could say that conceptual schemes that are different in a radical way from each other correspond to languages that are not intertranslatable. How can we, however, make sense of a total failure of intertranslatability among languages? For sure “we could not be in a position to judge that others had concepts or beliefs radically different from our own”.<sup>3</sup> Davidson’s conclusion is that if one gives up the dualism of scheme and world,

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<sup>1</sup> D. Davidson, “On the Very Idea of a Conceptual Scheme,” in *Inquiries into Truth and Interpretation*, Clarendon Press, Oxford, 1985, pp. 183-98.

<sup>2</sup> *Ibid.*, pp. 190-1.

<sup>3</sup> *Ibid.*, p. 197.

he will not give up the world, but will instead be able to “re-establish unmediated touch with the familiar objects whose antics make our sentences and opinions true”.<sup>4</sup>

Davidson’s solution is radical, but we are bound to ask at this point what the expressions “reality” and “world” mean for him. They seem to coincide with the world of common sense which is formed by the familiar objects whose antics - as he says - make our sentences and opinions true or false. These familiar objects are tables, chairs, houses, stars, etc., just as we perceive them in our daily life. One is not entitled to ignore, however, that the current discussions on the problem of scientific realism arise because there appears to be a strong asymmetry between the commonsense view of the world and the scientific one. For instance, the table that we see with our eyes is not the same table that we “see” through the mediation of scientific instruments, and this fact is not trivial. It is rather easy to reach a high level of inter-subjective agreement among the individuals present in a room about the color, size and weight of a table, and it can also be granted that we form our beliefs in this regard by triangulating with our interlocutors and the surrounding environment. Such an agreement, however, may turn out to be problematic when we try to reconcile this vision of the world with what today science tells us about it.

So, being in touch with such familiar objects as tables, chairs and stars “all the time” - as Richard Rorty adds - has a fundamental bearing only on the ontology of common sense, since our actual science shows that quite a different representation of reality can actually be provided (or, even better, it shows that those objects might *not* exist as men perceive them). Naturally, one can always resort to an objection of the following kind: Why should we deem the table viewed as a collection of subatomic particles more important than the table that our eyes see in daily life? After all, we can conduct our life well enough even ignoring what science claims (just like men did for many thousand years). This, however, may be judged as a serious underevaluation of the scientific enterprise. As a matter of fact, in the last centuries we are confronted not by one world-view, but by two complex images, each of which means to be a complete picture of man in the world. Wilfrid Sellars called these two perspectives, respectively, the *manifest* and the *scientific* image of man in the world.<sup>5</sup>

They are both intersubjective and non arbitrary. What are, however, these two images, and are they really alternative? Let us note, from the onset, that the two images we just mentioned are both idealizations in the same sense of Max Weber’s “ideal types”. This means that, in order to discover their actual presence, we need having recourse to a good deal of philosophical abstraction. In other words, they are not disclosed by mere empirical recognition. For instance, we live *in* the commonsense view of

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<sup>4</sup> *Ibid.*, p. 198.

<sup>5</sup> W. Sellars, “Philosophy and the Scientific Image of Man”, in *Science, Perception and Reality*, Routledge & Kegan Paul, London-New York, 1963, p. 1-40.

the world, and only a complex process of reflection makes us understand that we, as human beings, share a common view of the world, which is in turn determined by the fact that our physical structure bounds us to conceive of reality in a certain way rather than in another. Think about the importance that light, for example, has not only in daily life, but even in our philosophical conceptualization of the world. The story is complicated by the fact that each image has a history, and while the manifest image dates back to pre-history, the scientific image is constantly changing shape.

**Keywords:** science; language; common sense; scientific image; manifest image.

## Introduction

The following is the Sellarsian description of the manifest image: “The manifest image of man-in-the-world can be characterized in two ways, which are supplementary rather than alternative. It is, first, the framework in terms of which man came to be aware of himself as man-in-the-world. It is the framework in terms of which, to use an existentialist turn of phrase, man first encountered himself - which is, of course, when he came to be man. For it is no merely incidental feature of man that he has a conception of himself as man-in-the-world, just as it is obvious, on reflection, that if man had a radically different conception of himself he would be a radically different kind of man”.<sup>6</sup>

This characterization is important for our purposes. It entails, in fact, that a replacement of the commonsense image of the world would lead us to see ourselves in quite a different manner and, obviously, it may be asked to what extent this can actually occur. If man could not be man until he encountered himself, what we said above implies that this encounter (which is a *socially shared* one) took place in the manifest image. Switching to another image means that the aforementioned encounter should be re-worked from the start. But we also know that conceptual thinking is deeply entrenched in the manifest image. Since the ability to think is nothing but judging thoughts by standards of correctness and relevance, it should be noted that these standards, in turn, are relative to the manifest image, and their replacement is no easy task. On the other hand the manifest image is no naive conception, since it may be characterized as a refinement of a more primitive image which was gradually replaced during the cultural evolution of mankind. In this sense, the conceptual framework of the manifest image is, itself, a kind of scientific image. Sellars noted that “There is, however, one type of scientific reasoning which it, by stipulation, does *not* include, namely that which involves the postulation of imperceptible entities, and principles pertaining to them, to explain the behavior of perceptible things”.<sup>7</sup>

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<sup>6</sup> W. Sellars, *ibid.*, p. 6.

<sup>7</sup> W. Sellars, *ibid.*, p. 7.

We can say, at this point, that in our daily life the manifest image dominates the scientific one, and this entails quite important consequences. The philosophical vision of man in the world appears to someone to be distorted because of this fact, since man is *essentially* a being which conceives of himself in terms of the manifest image. If so, one is bound to conclude that man's conception of himself in the world does not easily accommodate the other image (the scientific one). The picture of man in the world that the scientific image provides us with seems to be at odds with the one provided by the manifest image, in the sense that there is tension between them. If the scientific image is correct, then man is not the sort of being he conceives himself to be, in the sense that his whole existence appears to be based on error. Sellars even notes that this is no novelty in the history of philosophy: "One thinks, for example, of Spinoza, who contrasted man as he falsely conceives himself to be with man as he discovers himself to be in the scientific enterprise. It might well be said that Spinoza drew a distinction between a "manifest" and a "scientific" image of man, rejecting the former as false and accepting the latter as true".<sup>8</sup>

If we recall that to ask what are the basic objects of a framework is to ask for a *classification* (and not for a simple list), it should be obvious to anyone that the basic objects of the manifest image are all kinds of living beings and all kinds of material things. But the manifest image itself is no "external" standard either, because it has an *objective* existence which transcends the personal opinions of individual thinkers. This means that in the manifest image we find truth and error, although the possibility is open that such image might have to be rejected, in the last analysis, as false. In other words, we can evaluate the correctness or incorrectness of the description provided by the manifest image by having recourse to well-established standards. If so, the fact that human beings are what they are because they think of themselves in terms of the manifest image, leads one to ask to what extent the manifest image of man can survive in a picture where the scientific image, which grew up in the last centuries, becomes the dominant element.

Furthermore, it looks plausible to think that the manifest image echoes, in a more or less adequate way, the *intelligible* structure of the world. Notice that we said the "intelligible" structure of the world, and not the structure of the world *as such*. There is, obviously, a great difference between these two expressions: The adjective "intelligible" makes the difference. However, we can say, at most, that our ordinary language mirrors the manifest image. This image includes not only commonsense objects, but also theories, beliefs, etc. It is an *interpretative* device, rather than a faithful and mechanical reproduction of what our senses perceive. Sensory data have meaning only within a theoretical framework. To say "This is a table" means already *to classify*. Nothing, in sensory stimulations, tells us that "this" is a table, which has some

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<sup>8</sup> W. Sellars, *ibid.*, p. 8.

characteristic in common with all the objects of the same kind. It is the *social* (inter-subjective) dimension that counts. Even if the manifest image were false, then, there is truth and error within it: it is *objective*. But this kind of objectivity is objectivity-for-us.

Ordinary language, thus, mirrors the manifest image at large. Obviously this fact is very important but, on the other hand, it does not authorize to claim - as some analytic philosophers today do - that language mirrors *the* world, so that the analysis of language would allow us to build some kind of absolute ontology. Were this be true, Micheal Dummett would be right in claiming that the philosophy of language replaced metaphysics, thus becoming the new "first philosophy".<sup>9</sup> We cannot say this because the manifest image is *not* the world. The importance of common sense cannot be denied: It is the main instrument we have at our disposal for interacting with the environment. Our natural language reflects the world of common sense, and this is perfectly obvious. But natural language is silent when dealing with quantum phenomena. Only someone believing in the equation "natural language = absolute ontology" may believe this.

According to this picture language is the best way at our disposal for getting a comprehensive view of reality. But one must be very careful in evaluating remarks like these. If they mean to tell us that the picture of the world inferred from language is the picture by which we organize our life and through which we get in touch with the world, no sound objection arises. But if they mean to convey the impression that this very picture and the world at large are one and the same thing (as Richard Rorty sometime seems to imply), and if we take this impression for granted, we shall indeed have great problems for specifying why, and how, today science provides us with a different kind of information. We should instead say that language makes manifest the large features of *our* reality. Naturally one can always try to build bridges between the commonsense image and the scientific one and, in the end, it may turn out that these bridges may - at least partially - be established. This move, however, needs a complex and patient work of analysis and exploration, a work that one does not find in the writings of those authors who endorse the stance mentioned above.

## The manifest image

What, then, about the problem of the relations between thought and the world? On the one side the constituents of thinking are believed to be at least qualitatively similar to the basic constituents of the world, while, on the other, the world is believed to be the *cause* of the events taking place in the mind (or, to put it in a different way, the events in the mind are supposed to echo the events occurring in

<sup>9</sup> See M. Dummett, Frege: *Philosophy of Language*, Duckworth, London, 1973, and M. Dummett, *The Logical Basis of Metaphysics*, Harvard University Press, Cambridge (Mass.), 1991.

the world). However, associating thoughts is different from associating images, in the sense that a “framework of conceptual thinking” is presupposed anyhow. And this makes us understand an important fact: The action of the world on the individuals can explain connections of the associative kind, but not the *rational* connections of which conceptual thinking is made. Obviously this does not mean to deny that the world really is the *cause* of the individual’s image of the world. Philosophy has insisted for centuries on the causal action of the world - conceived of as “intelligible” world - on the mind. But the causal role that nature plays with reference to conceptual thinking cannot be equated with a conditioning of the individual by his natural environment without the mediation of social and community standards. The role of the group as a mediating factor in this causal connection is indeed essential.

If we conceive experience as the stimulation of sensory receptors - as Quine does - we rule out the possibility of rational links between experience itself and beliefs, while conceptual schemes may be viewed not just as piecemeal beliefs, but rather as sets of logically interconnected beliefs. Sellars told us that the world of concepts is essentially formed by rational relations. In his most famous essay he claimed that when we describe the “states” that lead us to knowledge we not only describe them empirically, but also locate them in a logical space which has a rational character. And only within this logico-rational space are we able to *justify* what we say.<sup>10</sup> The essentially social character of conceptual thinking comes clearly to mind when we recognize that thinking would be impossible in the absence of common standards of correctness and relevance, which relate what a particular individual thinks to what anyone *ought* to think. The contrast between the “I” of the individual and the “anyone” of the group is indispensable to rational thought. The representation of themselves that the individuals of a group hold is essential to the existence of the group: *Communication* embodies, so to speak, the essence of conceptual thinking. But it is likewise evident that only within the group can communication have meaning.

All this, in turn, means to seriously question the traditional image of the Self. The “I think” presupposes anyhow the presence of group criteria determining the meaning of the “I” in relation to others: Clear and distinct ideas do not exist in isolation. So, one is then bound to ask in what sense, if any, could the manifest image survive the attempt to replace it by an image of man as conceived in merely scientific terms. It is evident, in fact, that man conceived of in purely scientific terms is quite different from man as he conceives himself according to the standards of the manifest image.

### The scientific image

As I noted previously, the scientific image of man is an idealization; it is difficult to define it in precise terms because it is constantly evolving. Moreover, it might be objected

<sup>10</sup> W. Sellars, “Empiricism and the Philosophy of Mind,” in *Science, Perception and Reality*, cit., p. 169.

that the scientific images are more than one, in the sense that physics, chemistry, biology, sociology, etc. have, each, a particular image of man, and each of these images should, in turn, be confronted with the manifest one. Nevertheless, when we turn our attention to *the* scientific image which emerges from the several images of the different sciences, we find that it means to be a *complete* image which is supposed to contain the whole truth about the world. Just for this reason the scientific image may be thought of as a *rival* image. From the point of view of the supporters of the scientific image, the manifest one is totally inadequate, since "true" reality is mirrored in the scientific image. As we have just seen, the objection is that the scientific image cannot replace the manifest without challenging and rejecting its own foundations.

At this point it is important to note that any argument purporting to show that commonsense objects is what *really* exists, ruling out the existence of other kinds of objects, operates within the framework of common sense and, thus, provides us with no *external* point of view from which to support it. It is no help resorting to the notions of consistency and inconsistency, since a framework may be inconsistent and, yet, be a successful conceptual scheme in daily practice. Many problems arise when some authors - and Sellars among them - endorse the primacy of the scientific image. Sellars, for example, accepts the view that "the scientific account of the world is (in principle) the adequate image"<sup>11</sup>, so that "science is the measure of all things, of what is that it is, and of what is not that is not."<sup>12</sup>

For sure there are many doubts about the possibility of construing such a scientific image (however idealized). The question in this regard is: *Which* scientific image are we talking or thinking about? A stable synthesis like the one envisioned above looks practically unachievable. One can endorse such a stance only if scientific research could come to a resting point, and it may be argued that we have no evidence that this is the case (or, even better, evidence goes in just the opposite direction). It should be noted, furthermore, that even the manifest image cannot be taken to be stable. As a matter of fact it evolves, bringing within its framework elements that come from the scientific image. The ontology of common sense is not stable and determined: It is not "given" once and forever. It continuously evolves by incorporating elements stemming from the scientific image.

A final remark is needed at this point. A picture like the one provided above makes sense only if science were something "neutral", while it looks more reasonable to think of it as *our* science. Science always is the result of inquiry into nature, and this is inevitably a matter of *transaction* in which nature is one party and the inquirer is the other. Given this fact, science is not something altogether independent from the

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<sup>11</sup> W. Sellars, "Philosophy and the Scientific Image of Man", cit., p. 36.

<sup>12</sup> W. Sellars, "Empiricism and the Philosophy of Mind," in *Science, Perception and Reality*, cit., p. 173.

scientists which practice it and from their peculiar proceedings. Just for this reason we cannot accept the Protagorean statement that “science is the measure of all things.”

### The notion of a “final theory”

Let us note now that science does not merely purport to produce theories, but it develops them for practical reasons: People are supposed to *use* those theories. The logic of explanation might come to a resting point only if science were able to attain completion. In the completed science (or “final theory”), in fact, men no longer need to inquire into the nature of objects; the final science is supposed to describe all possible aspects of the world, thus getting the picture of the world as it *really* is. In order to justify such a stance, one needs to adopt a Peircean position which assumes a linear progression in science, culminating in one - i.e., the final - theory. However, in our century uncertainty about the content of theories has grown fast, together with the feeling that there are *alternative* theories that can account equally well for all possible observations. Clearly the threat of relativism arises at this point, even though, nowadays, relativism no longer seems to be a threat, but just a fact of the matter.

Charles S. Peirce’s “long-run convergence” theory of scientific progress should thus be replaced by a more realistic position based on increasing success in scientific applications. But “perfection” (i.e.: the *completion* of the scientific project at large) looks, in principle, unfeasible. This means to oppose all those projects whose aim is the search for the “final theory”, a good case in question being that of the physicist Steven Weinberg.<sup>13</sup> We can never assume that a particular scientific theory - for instance, Einstein’s relativity theory - gives us *the* true picture of reality, since we know perfectly well from the history of science that, in a future we cannot actually foresee, it will be replaced by another theory. And it should be noted, moreover, that this future theory will be better for future scientists, but not *the best* in absolute terms, since its final destiny is to be displaced by yet another theory.

Scientific realism must thus be strictly tied to the distinction between reality-as-such and reality-as-we-think-of-it. There is little justification for believing that our present-day science describes the world as it really is, and this fact does not allow us to endorse an absolute and unconditioned scientific realism. In other words, if we claim that the theoretical entities of current science correctly pick up the structure of the world, we run into the inevitable risk of hypostatizing something - i.e., our present science - which is only an historically contingent product of humankind, valid in *this* particular period of its cultural evolution. But what about *future* science? We might in fact be tempted to say that, since present-day science is really bound to be imperfect and incomplete, perhaps future science will do the job, thus accomplishing that project of “perfected science”. Even in this case, however, many problems arise. First of all,

<sup>13</sup> See S. Weinberg, *Dreams of a Final Theory*, Pantheon Books, New York, 1992.

just *which* future are we talking about? There is indeed no reason to believe that tomorrow's science will be very different from ours as long as its capacity of providing the "correct" picture of reality is concerned. The fact is that scientific theories always have a finite lifespan. This is so for every human creation (and science *is* a human product, in any possible sense of the term).

Science, in sum, is not a stable system, but a dynamic process, and this fact leads us to view as problematic all those conceptions that place on the shoulders of future science the burden of perfection. Not even the fascinating theses of Charles S. Peirce escape this fate. According to Peirce's "convergent approximationism", the scientific results we are able to reach with the passing of time grow increasingly concordant, and the results consequently become less and less differentiated. Although such an optimistic picture cannot be rejected from a logical point of view, our historical experience, based on what the history of science teaches us, shows that the reverse is much more plausible. Ideal science, even when its realization is referred to the future, looks more a philosophical utopia than a feasible accomplishment (even though utopias are indeed useful when they are viewed as essentially "regulative" ideas).

This means, in turn, that our cognitive enterprise must be pursued in an imperfect world, and the strong realistic thesis that science faithfully describes the real world should be taken for what it is: A matter of *intent*. Instead of speaking of "science as such" (perhaps with a capital "S"), it is better to make our discourse more precise, dealing for instance with the science made by twentieth century scientists, or with the scientific conceptions held by scientists living in the seventeenth century, and so on.

On the other hand, the relations between commonsense claims and those made by science are rather complex, and we should get rid of the thesis that the scientific world-view is, in any possible meaning, better than that put forward by common sense. In particular, the exactness of technical scientific statements make them quite vulnerable while, in ordinary life, assertions are indeed vague, but on the other hand acquire security through inexactness. This situation can be explained well enough recalling that common sense has the fundamentally practical aim of providing the framework in which our daily life is to be conducted, and at this level we do not need great degrees of precision. Natural science's aim, instead, is that of looking for maximal definiteness, and thus for maximal precision and testability. Doing so, the vulnerability of scientific statements becomes quite obvious: It is just the inevitable other side of the coin of definiteness.

### **Science and practice**

Let us now go back to the claim that the commonsense view of the world is fated to be replaced by the scientific one. On what grounds can we claim the falsity of the manifest image? Clearly, we are allowed to make such a move only by adopting a teleological

view of science, i.e., by admitting the plausibility of a final theory. However it should also be noted that, in order to do that, we must take into account the manifest image as it looks like when we have a final science which can be presented as a real rival (as we said above, there is indeed no reason to believe that our *actual* scientific image is true). Since the present state of science is one of becoming, our actual science cannot have the force to replace common sense. It looks, in fact, absurd to compare the completed *future* science to the *present* manifest image. First of all, we do not know how this future science will look like, and, second, we cannot rule out the possibility that the manifest image develops even further, along with the scientific. It follows, then, that the second term of the comparison must be the scientific image "at the last possible stage", because nothing else could do the job.

If, however, we ask in *which context* the principle that authorizes the abandonment of one scheme in favor of another is located, the answer is that it should be located in the context of common sense itself. Any attempt to refine - and make more precise - the commonsense conceptual scheme in which we think about the world is motivated, at least primarily, by the necessity to *act* on the kinds of knowledge such refinements can produce. And this, in turn, means that the aforementioned refinements aim at making the scheme more responsive to our *practical* needs. The view of science's activity as postulating imperceptible entities to explain the behavior of the perceptible ones can be accommodated into this picture. For sure science began because of the need to explain, but this need is not an end in itself, since explanations are sought in order to grant the success of our practical endeavors.

So, not only does common sense produce the manifest image; it is also the framework in which science begins. Just in this sense, science is a part of the framework of common sense. Given the ineliminable practical side of our cognitive efforts, common sense would not initiate scientific inquiry without expecting to get something out of it, at least in the long run. Even common sense purports to answer the fundamental questions about the structure of the world, and it is likely to endorse whatever science has to say, once it is convinced that science can indeed answer the questions.

And this is the core of the problem, because common sense itself constantly undergoes the same sort of changes that characterize science. Common sense contains both beliefs and theories, which are constantly abandoned or developed and, if so, the image of the world that it generates must also change. There is indeed no reason to exclude that, if common sense is convinced of the value of specific scientific theories, it will adopt them. It follows that the acceptance of science is a common sense activity, and that the acceptance of the several scientific images of the world which evolve with the passing of time is a likely function of common sense, too. No doubt this entails a continuous refinement of the conceptual basis of common sense, a refinement which is detectable in our daily experience.

Recall that, according to the supporters of the scientific image, the “true” image of the world is supposedly generated by the final theory, while there is no doubt that the manifest image is produced by common sense. The final theory, in turn, is fated to replace common sense by redefining the terms of our ordinary language, and replacing the rules of thought entrenched in common sense with theoretical correlates. However, if common sense need not be in conflict with science in the long run, such a theory is practically unattainable. If the acceptance of the products of science is a function of common sense principles, and if, furthermore, this acceptance is essential to our understanding of the role of science, it is misleading to conceive of the scientific image as replacing the manifest. Science is promoted by common sense given our constant need to know in order to *act*.

Even granting the possibility of a final theory, for it to replace common sense requires that it be *rationally* accepted or adopted. And what is the reason for adopting science? To answer that the final theory must be adopted because it explains means to give only a sufficient, but not a necessary condition. Knowledge, as we said before, is for the sake of action. If the final theory is adopted for the sake of action, it becomes part of common sense, which is totally different from replacing it. To resort to a paradox, we might even say that, in these circumstances, the scientific image becomes the manifest one. Common sense is, in sum, presupposed: If the possibility to build a final theory fated to replace common sense depends in turn on the possibility of its rational adoption, such a replacement is devoid of meaning. Common sense turns out to be anyway the engine of the whole operation, since it just *uses* the picture generated by science.

This should make us understand, in addition, that the concept of “manifest image” cannot be too precise. The manifest image is a function of common sense, and common sense is not a static, but rather a *constantly changing* body of beliefs and principles. Its core characteristic is provided by the set of principles which encourages new ideas. Just for this reason we are bound to conclude that the basic principles of common sense have a fundamental methodological hold on us. Undeniably the “completed” science is not an actual possibility but, rather, a regulative ideal. It works just as the concept of utopia in political philosophy: It may be very dangerous if we take it to be an actual possibility, and not a regulative ideal.

### **The importance of conceptual schemes**

We have, thus, reasons for doubting that the fundamental principles of common sense can be replaced by a set of principles which can do a better job. In order to get this result, science should be conceived, once again, as progressing toward a unified completed stage in which it could take over from common sense, while the perceptible objects of daily life should be conceived of as not real. The abandonment

of the manifest image would follow as a logical consequence of this state of affairs and, perhaps, we should engage in a series of redefinitions using correspondence rules, a variety of which is already operative when, for example, we say that the table is really a collection of electrons.

The problem is that even microphysical particles, just like commonsense objects, are dependent on some kind of conceptual scheme. In a recent book Hilary Putnam replies to some arguments by Ian Hacking in the following way, commenting on Hacking's famous statement concerning positrons, "If you can spray them, then they are real":<sup>14</sup>

Now what does it mean to believe that "they" are "real"? If it means that one believes that there are *distinct things* called "positrons", then we are in trouble - a *lot* of trouble - with the theory (...) I suspect that Hacking wants to say that *here*, in *this* experiment, positrons are "real" *without saying what that means* (...) I do not, of course, wish to say that positrons aren't real. But believing that positrons are real has conceptual content only because we have a conceptual scheme - a very strange one, one which we don't fully "understand", but a successful one nonetheless - which enables us to know what to say about positrons, when we can picture them as objects we can spray and when we can't. Hacking's attempt to draw a sharp line between fact and theory (...) founders on precisely the interpenetration of fact and theory (...) the word "positron" isn't a *copy* of a reality, but a "notation", and it is the *theory* that instructs us in the use of the notation. Again the theory and the fact (positrons were sprayed) are not even notionally separable.<sup>15</sup>

We know that objects form the primary subjects of the framework of common sense, and the need to replace the manifest by the scientific image is justified by a principle which argues against ontological crowding, envisioning the elimination of a set of logical subjects in favor of another. But does such a principle make sense? One reason for endorsing this principle might be the fact that instrumentalists, for example, accept the manifest image as real, and view science as only a useful tool. However, it does not follow that this is the only way in which to deal with the manifest image. In other words, we cannot deny that commonsense objects are real because a philosophical trend we dislike accepts them. Recall that, according to Quine, we must resist the temptation to adopt an overcrowded ontology (an "overpopulated universe"<sup>16</sup>). But we would like to stress that the attempt to base ontology on a sort of linguistic/aesthetic preference looks unjustified: If reality were truly overcrowded from the ontological viewpoint, would it follow that we should give priority to our preferences rather than to the ontological structure of reality? Maybe Ockham's razor,

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<sup>14</sup> I. Hacking, *Representing and Intervening*, Cambridge University Press, Cambridge, 1993, pp. 21-4.

<sup>15</sup> H. Putnam, *Pragmatism: An Open Question*, Blackwell, Oxford-Cambridge (Mass.), 1995, pp. 59-61.

<sup>16</sup> W.V. Quine, "On What There Is", in *From a Logical Point of View*, Harvard University Press, Cambridge (MA)-London, 1980, p. 4.

after all, is not such a good ontological criterion: Why should we decide to simplify, following our personal taste and opinions, a reality which is itself complex?

To assert that, because of certain biological characteristics which permit perception of objects of certain sizes and sounds within certain frequency, those features hold absolute primacy means to deny free range to our other faculties. But just as it would be absurd to say that the world of objects and processes falling within our perceptual range is all that is real, similar claims for the world of imperceptible entities are unreasonable. A large class of items get in touch with us in a perceptual manner, despite what else might be true of them. This is independent of the role of language, which is not to deny that language has an important role in helping us organize our response to the world. The conclusion to be drawn from these remarks is that, given certain facts about ourselves, and that we live in a world which looks, in an unreflective way, different from the world pictured by science - but nevertheless real - the arguments for ontological simplicity tend to oversimplify a very complicated situation. If we recall that the principles which give rise to science are principles of the framework of common sense, then perhaps with a little more reflection on the characteristics of common sense we might get a better result.

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