

THE SCIENTIFIC IMAGES AND THE GLOBAL KNOWLEDGE OF THE HUMAN BEING

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Knowing What Man Is

Know yourself was considered already in antiquity as the imperative in which the core of wisdom is concentrated, and the force of this imperative was stressed by its being attributed to Apollo's oracle (hence to a divine source), so that a correct answer to the question implicit in this imperative ('Who am I?') was considered the solution to the problem of finding one's happiness. That of attaining an adequate knowledge of oneself is a task of paramount importance, since it coincides, in the last analysis, with the problem of finding a *sense* and a *value* for one's life and this is certainly the most radical and essential problem for every conscious being. Unfortunately many humans do not have the necessary time and existential conditions for devoting the adequate *reflection* to this capital issue, but no *conscious* life (i.e. no *genuinely human* life) can develop without some kind of awareness of this problem, simply because no human being can escape being confronted with the totality of his whole *experience* (i.e. his own *Life* taken in all its multifaceted dimensions), in which he is personally involved and has to find out *his* best way of spending life.

Is this an easy or a difficult task? At first it seems easy, since in the case of self-knowledge we do not need to 'cross the gap' between subject and object of knowledge, that is often seen as an obstacle in the effort of ascertaining 'how things are'. Nevertheless we quickly become convinced that in the effort of knowing ourselves we do not really enjoy a significant privilege with respect to the knowledge of the so-called 'external world': we do not know, for instance, how the internal structure and functioning of our body are organised, how our emotions can drive our conduct, how we can retain memories of past experiences, and so on. Of all these aspects of our reality

we do not have an *immediate knowledge*, and this is why humans have tried from time immemorial to obtain such a knowledge by using suitable *means*, or by resorting to reliable *sources and authorities*. This is true, in particular, not only regarding 'matters of fact' such as those we have just mentioned, but also (and even more significantly) regarding those 'ultimate questions' that regard the sense and value of Life taken globally, and which imply a correct understanding of 'what is man', of 'what is the world', and 'what is the position of man in the world', besides the question of whether this world exhausts the reality in which human life can find its sense and value. For many centuries humans have resorted to *religion* and *philosophy* as sources for the solution of the 'ultimate questions'. Simply because these were considered as the most reliable sources of *knowledge* in general, and the methods they used were divine *revelation* and *metaphysical speculation*.

The New Intellectual Authority: Modern Natural Science

The situation changed at the beginning of 'modernity', when a new source of knowledge, equipped with its peculiar methods, appeared in Western culture: the natural *science*, understood in the new 'modern' sense of this concept. This 'new science' (the adjective 'new' explicitly appears in the title of Galileo's scientifically most relevant work) was initially well aware of its limited and delimited scope, that is: (i) the object of inquiry was only the 'local motion' of material bodies, (ii) the aim of 'grasping the essence' of things was considered a desperate enterprise (the 'what is?' is not the kind of questions to be asked in this science), (iii) only strictly empirical evidence (phenomena) must be considered as reliable knowledge from which only prudent generalizations can be tentatively admitted, (iv) moreover, among the properties of material bodies only a few will be investigated, those that are expressible as mathematical magnitudes, (v) the combination of empirical evidence with mathematical calculations is the backbone of the *experimental method* thanks to which it is possible (and mandatory) to submit to test any not strictly empirically supported scientific assertion, (vi) in particular this mathematization and these experimental testing are possible because artificial *instruments* are designed for making observations and measurements.

The new natural science attained, in the course of just one century, such an impressive harvest of knowledge that even philosophers gradually became convinced that this progress was obtained not 'in spite of', but 'in virtue of' the above mentioned limitations. While thinkers like Descartes,

Spinoza and other 'rationalists' maintained that sound knowledge in any field can be acquired by a generalized adoption of the mathematical method of reasoning, other thinkers, and paradigmatically Kant, theorized that genuine knowledge in general is possible only by respecting the conditions fulfilled by the modern natural science (i.e., application of mathematical conceptualization to empirical phenomena). This science was, at that time, mechanics whose tacit ontological elements were matter and motion. Therefore it was implicitly admitted that genuine knowledge can be attained only in the domain of material things. Philosophers were aware of this situation and, apart from a minority that was already embracing a materialistic metaphysics, the majority was still adhering to the general conception that had been characteristic of Western philosophy and, in particular, admitted a spiritual and transcendent dimension of reality of which God was the supreme being and also humans participated, as far as their nature included the possession of a spiritual immortal soul. The most typical representative of this 'spiritualistic' trend was Descartes, whose philosophy was very welcome at his time especially for having found a plausible solution to the problem of recognizing the full value of the new mechanistic natural science and at the same time the no less genuine value of the metaphysical speculations. This solution consisted in the famous *dualism* according to which reality is split into two separate *substances* (*res cogitans* or spirit, and *res extensa* or matter), and while the study of material entities was entirely and exclusively attributed to the competence of the natural sciences, the study of the spiritual entities was entirely and exclusively attributed to the competence of metaphysics, religion and theology.

The Cartesian Dualism

Since the said partition reflected itself also in the consideration of man, the consequence was that the human body (which is a material substance) can and must be studied through the natural sciences and is exclusively endowed with material properties, while the human spirit is immaterial, is endowed with properties that cannot be investigated by natural science but can and must be studied and recognized with the tools of metaphysical knowledge (that, in particular, justifies the traditional perspectives of the Christian religion).

Despite its *prima facie* plausibility this compromise solution was rather fragile, especially in its interpretation of man. The ontological separateness of the two substances implied the impossibility that the one could act upon

the other or, in general, have any kind of causal influence on it, and this made impossible, for example, to explain sensory knowledge in which we form intellectual immaterial images of the external world that can act upon our material sense organs, or, inversely, to explain how an immaterial act of volition can produce the motion of my hand or any part of my material body. These, and similar, difficulties were actually the consequence of having artificially imagined something that is contrary to the most immediate content of our existential experience, that is, the *unity* of this experience, in which we do not distinguish soul and body, and, in any case, any human being apprehends himself as *one* and not as *two*. This is also reflected in our use of the language: when I say 'this is *my* hand' I do not mean that this hand is my 'property', but that it is 'part of' myself (at variance with the sense of a sentence like 'this is *my* car', which means the possession of something different from myself).

This is why a tendency towards the overcoming of this dualism was tacitly at work in the history of western philosophy and it can be seen as the programme of eliminating one of the two poles by 'reducing' it to the other: materialism pursued the proposal of reducing the whole of reality (in particular of man) to matter, by showing that the alleged spiritual characteristics are either the product of complex material structures or simply intellectual inventions; spiritualism attempted to prove the opposite thesis, that is, that matter is simply an initial still unconscious stage in the development of spirit. One could say that such opposite trends were not that new, after all, but we must consider what powerful support the materialistic perspective had received by the development of the new natural science. This development not only had shown that in the domain of matter a great and uncontroversial amount of new knowledge had been actually achieved, but that the validity of this knowledge could be proved also *concretely*, that is, through the construction of a great display of new artefacts, the *machines*.

The Fascination of Machine

The significance of machines in the development of Western culture is often recognized in the sense that they offered to humans the capability of magnifying their *practical power* of operation and production, paving the way to the industrial revolution. This is true, but even more significant is that modern machines are to a large extent the 'application' of knowledge acquired in the natural sciences, so that we know how they will function and why they will function in a given manner *before* their concrete realiza-

tion (they are *invented* or *projected* and not *discovered*). In this sense they seriously represent a tangible empirical *confirmation* of the scientific theories that were used in their design and play a genuine *intellectual role*. Moreover, in a machine nothing remains mysterious or secret: scientific knowledge completely *explains* its structure and functioning. Therefore, if of a certain object of study we are able to propose a 'model' in the form of a certain kind of machine, we have the impression of having completely understood and explained this object. We can call this the *epistemological purport* of the machine, which explains the fruitfulness of adopting machines for the modelling of different processes. But this feature very easily drew with itself an *ontological reduction*: if a certain domain X of investigation becomes intelligible by using models derived from a given natural science N, it seems obvious that its properties are reducible to properties of the objects treated by that science, and if N is concerned with material objects, its competence seems to become extended also over X (i.e. the properties of X are 'in the last analysis' also material).

This actually happened in the interpretation of the human being. Descartes was one of the first to present an articulated picture of the human organism as a complex mechanical machine, but he explicitly intended that this picture concerned exclusively the human body (including also several functions that we qualify as psychic and are common to many animals). In his view the spirit (that is, the sphere of our conscious activities and in particular self-consciousness) remains out of reach of this mechanical investigation and explanation, and taking the intellectual evidence of the *cogito* as starting point, metaphysical reflection can lead us to prove the existence of God, free will, the immortality of soul and the other fundamental metaphysical doctrines of the tradition. Other thinkers, however, who subscribed to a materialistic philosophy, did not follow this Cartesian distinction: in his famous work *L'homme machine* Lamettrie made the effort to show that the whole of human capabilities can be expressed and explained in terms of mechanical procedures taking place in the body, while the alleged spiritual realities in man and outside man are simply inventions of persons wanting to dominate people by exploiting their general ignorance and their fear of death. This trend never stopped in the following centuries: after mechanics, other sciences attained a leading position in the domain of natural sciences, and they easily suggested various forms of 'machines' (chemical, thermodynamic, electrodynamic, cybernetic, and so on) for the modelling of the human being, a modelling that was taken in a reductionist sense by all those who were inspired by a pre-

conceived materialist metaphysics. The novelty that has emerged more recently is that such machines (that formerly had the status of *conceptual* constructions very similar to the hypothetical constructions of scientific theories) can now be *concretely* realized and, in certain cases, can actually perform some functions and operations of which man (according to traditional views) is capable thanks to his intelligence. This is taken by several scholars as an evidence that no spiritual intelligence is needed in order to account for these functions. The reasons for which this conclusion is not justified cannot be discussed in this paper.

The Elimination of Finality

The elimination of spirit was not the only reason of dissatisfaction with the materialistic interpretation of reality based on the new natural sciences. An additional reason was that the methodological framework of these sciences explicitly excluded the consideration of *final causes*. Natural science could not dispense with the concept of cause and with causal explanation, but reduced it to the meaning of efficient cause (i.e., of something that 'produces' an event), that was introduced under the seemingly non-metaphysical notion of *force*. Force, that produces the *change* of motion (not motion itself, that is as primary as matter), acts on material bodies *from the outside* (and not from the inside, as the ancient formal and final causes were thought to act), and the result of physical actions is *fully determined* by the initial conditions and the applied forces, but does not conform to any design or pursue any goal. Therefore the suppression of finality and freedom were inexorably included in the worldview solely based on the new natural sciences and such an elimination (besides posing serious problems in the conceptual and theoretical construction of the lifesciences) jeopardized the possibility of giving a sense and a value to whatever reality, and cut the roots of morality. Once again the way for avoiding this conclusion was seen by several philosophers in the adoption of a *dualistic perspective*. Since it was impossible to deny that natural science had acquired a tremendous amount of knowledge by its methodological restrictions, it seemed legitimate to claim that this approach was pertinent precisely in the domain of nature, but not in other domains. The most interesting example of this special form of dualism is that of Kant, who maintains that deterministic efficient causality is necessarily present in our knowledge of nature, because this knowledge regards only *phenomena* that are organized deterministically by our own intellectual categories. But beside the world of phenome-

na (the only we really *know*) there is also the world of *noumena*, of 'things in themselves' that we cannot know in a proper sense, but we can *think of* without contradiction. In this world freedom and finality are thinkable and can exist, and we can even come to affirm their existence (without precisely knowing in what they consist and how they act) if we have other *sources* of information. For Kant this source is the interior experience of *morality*, that induces us to distinguish a *homo phenomenon* (a phenomenal man) deterministically included in nature and a *homo noumenon* (a noumenal man) endowed with free will, inviolable dignity, an end in itself and immortal. In short, we could say that with Kant the following dualistic compromise seemed attained: science has a full competence on natural phenomena, while philosophy has competence on man. The scientific discourse has a cognitive status in full sense, while the philosophical discourse has a less cogent cognitive status since its certitudes are rather 'moral certitudes' sharing to a certain extent the characteristics of a faith.

The Irruption of the 'Human Sciences'

But even this renewed version of dualism could not last too long. In the second half of the nineteenth century a new kind of sciences emerged whose domain of inquiry was precisely man (for this reason they are called in certain languages 'human sciences', though this expression is not common in English). While the inclusion of the study of man in the field of biology (significantly developed in the nineteenth century especially after the birth of the Darwinian evolution theory and the physical anthropology) was essentially a development of the perspective according to which the 'body' of man is a proper object of study of the natural sciences, these new sciences presented themselves as investigations of what has traditionally been considered the domain of the human 'spirit', that is, the individual human mind (that became the object of 'scientific psychology') and the collective product of the minds, that is, human culture (that became the object of sociology and various historical and social sciences). It is not really important, here, that the 'scientificity' of such new disciplines was advocated by certain authors in virtue of an alleged reducibility of their discourse to that of the natural sciences, by others in the name of a methodological affinity with these sciences, by others on the contrary, by vindicating a specificity of contents, aims and methods with respect to the natural sciences. What is important is the fact that, according to a view inaugurated by positivism, that became very influential and still dominates among cultivated people,

the creation of these sciences completed the maturation of an historical process in which science replaced philosophy everywhere and has been recognized as the only genuine form of *knowledge* that, in particular, can also offer the means for a *rational solution* to all human problems. This attitude is commonly also called *scientism*.

At first sight this situation has the advantage of having finally overcome *dualism* and its difficulties, in particular as regards the interpretation of man. But it is easy to see that this is not really the case. First, the majority of the partisans of scientism openly or tacitly subscribe to a materialistic worldview, so that the alleged elimination of dualism simply amounts to the old reductionist metaphysics. Second, the real shortcomings of dualism consisted in the fact that this perspective was unable to account for the *unity* of reality, and in particular of the reality of man, a unity in which the two dimensions have to interact, to become 'joined', so that the unity of experience that is present in every human being can be accounted for. Now, when the different sciences offer us their different *images* of reality (i.e. of *whatever* reality, including man), we are confronted not just with two, but with a very large display of images, so that the situation is not that of a reduction but of a multiplication of the difficulties already present in dualism. Indeed, contrary to a naïve first impression, two different sciences do not differ because they investigate two different domains of 'things', but because they investigate all things *from a delimited and specific point of view*. We can express this basic fact in different ways: from a logico-linguistic point of view we can say that every science adopts its specific *predicates* and constructs its technical vocabulary; from a methodological point of view we can say that every science provides the *methods* for establishing the *meaning* of its predicates and the immediate *truth* of its statements (criteria of *referentiality*); from an *ontological* point of view we can say that all this depends on the fact that every science does not investigate any reality *as a whole* but only a delimited number of *attributes* (properties and relations) of reality. These different ways of describing the situation amount to a unique fact: it is totally illusory to speak of *the scientific image* of reality globally understood no less than of any particular reality. This not so much owing to the fact that science is in continuous process of evolution and modification (such that it would be impossible to say *what is* this alleged scientific image), but especially because *there is not* a single scientific image, even taken at a given historical moment: there are the physical image, the chemical image, the biological image, the psychological image, the sociological image, and so on, and it is obvious that, given a certain

'thing', only a limited number of these different images can be applied to it (e.g. it would be meaningless to give the chemical image of a mathematical theorem or of a dream, or the psychological image of a stone). In short, it is an untenable claim to maintain (as Wilfrid Sellars once affirmed) that the progress of our knowledge consists in continuously replacing the *manifest image* of the world by its *scientific image*, because the former is intrinsically wrong and only the latter is true. Actually there is a sense according to which the manifest image and the different scientific images of the same reality may be 'true', but this sense must be carefully indicated.

Telling the Truth and Telling all the Truth

What has been said does not intend to underestimate the cognitive value of the scientific images. Quite the contrary, every scientific image is *partial* not only because it does not capture 'the whole of reality', but also 'the whole of any single reality', but this partiality is the price paid for a great advantage: *objectivity*. Indeed, it is the fact of having decided to *limit* attention to a few attributes of reality, of having denoted them in its language through technically well defined predicates, of having established standardized operational procedure for testing statements containing these predicates that has permitted to natural scientists first, and to other scientist later, to mutually control and test their empirical discoveries and theoretical constructions, attaining in such a way a considerable level of inter-subjective agreement and an increased knowledge *regarding those delimited aspects of reality* they intended to investigate. But this is tantamount to saying that the partial scientific images obtained in this way are *true*, provided that we are conscious that no proposition or set of propositions can be true (or false) 'in itself', but always and necessarily *about its domain of reference*. Now, since every science speaks only about its domain of reference, and since we can be confident that (despite never attaining an 'absolute certainty') it is able to produce a reliable *image of its domain*, we must conclude that this image is *true relatively to its domain of reference*. Precisely because truth is always relative in this referential sense, it would be absurd to pretend that any partial image is true also in other domains of reference, and even less in the whole of the thing from which the partial set of attributes has been selected. Coming to our theme, we say that any of the different sciences (natural and human) that offer scientific images of man, tells the truth about man, but *does not tell all the truth*. One could think that in order to know 'all the truth' it would be sufficient to cumulate the partial

truths coming from all the single sciences, but this conclusion is untenable. First, it makes allusion to a kind of infinite and indefinite task (not only the present sciences; but also the future ones should be taken into consideration); second, it is still biased by *scientism* because it is said that only the accumulation of scientific images can contribute to the attainment of the *complete truth*. But this is simply a dogmatic presupposition, that excludes the possibility that other kinds of truth could contribute to the attainment of the complete truth or, maybe better, of *the whole truth* (i.e. the truth regarding 'the whole' in its globality, in which also the relations between the different partial images should be considered).

The Richness of the Unity of Experience

In order to capture this global truth we have to rescue the cognitive relevance of many aspects of our *experience* in its full richness, such as we have already characterized it. In particular those aspects that are not strictly bound to sensory evidence alone and that we, nevertheless, commonly qualify as 'experience' (such as moral, aesthetic, religious, sentimental, affective experience), or are present to us in fundamental aspects of our cognitive activity, such as introspection or reflection. As we have already said, this Unity of Experience is, for every human, his *Life* that we could also call the *manifest image* of reality, not in the impoverished sense we encountered above, but in the sense of 'what is immediately present' to us and that, for this reason, is *methodologically* the starting point of any knowledge, but especially the *source of any fundamental problem*. This happens because the global unity of Life, once it becomes the object of reflection, inevitably generates the problems of its *sense and value*. This is *the problem* for every conscious being. and, characteristically, this problem generates the subquestion whether the value of Life is contained in the Unity of Experience or not. This is the *problem of the Absolute*, that coincides with the problem of giving a value to Life, that is of paramount interest for any human simply because from its solution depends *how one should* concretely conduct one's life. A conscious being, a being endowed with *reason*, inevitably wants to find the *true* solution to his problem of Life relying upon *knowledge and reasoning*. This is tantamount to recognizing that a *postulate of the rationality of the real* is implicit in this fundamental attitude, this postulate must be understood simply as the claim that it is possible to provide a conception of the Absolute capable of granting the value of Life. The effort will be that of transforming this postulate in a kind of theorem, by

actually finding this determination of the Absolute, and in this enterprise no element of truth can be disregarded. This is why the scientific truths must be included in this effort, because they become part of this Unity of Experience that we cannot ignore, but at the same time we are brought to consider what problems regarding the sense and value of Life overstep the possibility of treatment of these different scientific frameworks, and we easily find a great deal of them. In such a way we necessarily recover the full legitimacy of metaphysics as an intellectually not eliminable enterprise, since it is the only rational discourse concerning *the Whole* of reality, as well as the full intellectual legitimacy of the idea of *transcendence*, since this is (along with immanence) one of the two alternatives open to the rational solution of the problem of the Absolute. Of course, the existence of this problem and the postulate of the rationality of the real do not warrant that we will find the solution, and in this case this solution would be chosen as an act of *free faith*, as fortunately do many people who cannot devote themselves to philosophy. It is important, however, to see that this rational inquiry is possible and cannot be forbidden in the name of science.