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NOTES FOR AN
EPISTEMOLOGY OF HOLISM

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Author's Note

I. DESCARTES' INTUITIONISM AND CLASSICAL SCIENCE

Reality, any reality, when approached by a reasonably unprejudiced, inquisitive mind, can eventually acquire a thoroughly complex character. This impression of complexity can in turn unleash, especially in a subject trained in Western science, an eagerness for reducing the complexity to manageable terms by means of the construction of a theory. A beautiful theory often has the effect of lessening the impression of complexity and making us exclaim, "Well, so it was simpler than it looked, after all!" From this perspective it could be said, therefore, that the complexity or simplicity of any reality whatever is not so much a primary quality of the reality as a secondary quality depending on the state of our theory about that reality.

Now, a classic method for mastering the complexity of reality was formulated by Descartes in two of his famous rules: "Divide up each of the difficulties you are examining into as many parts as possible and into as many as require their best solution" and "Conduct your reflections in due order beginning with the simplest and easiest objects to know, in order to proceed little by little, as if by degrees, to knowing the most compound ones, also supposing an order among those which do not precede each other naturally."[1] This is often known as the "analytic" method, but it would be better to call it "analytic-synthetic" since, as transpires from reading the rules, the stage of analysis is followed by a stage of synthesis or composition of the elements separated by the analysis.

As is well known, the Cartesian strategy received a wide consensus, at least in the West. Empiricism added to it the principal according to which any theory, to be scientific, must be empirically grounded. The integration of the empiricism principle with the Cartesian method was the historical base of the experimental method. Experimental control rules such as the one which requires changing one variable at a time while keeping all the others constant and subsequently bringing together the different results obtained, clearly constitute an empirical translation of the Cartesian method.

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Now the consensus referred to was not universal; there were always dissenters. Henri Bergson,[2] for example, made the following criticism of the Cartesian method: When we analyze a whole, the elements we distinguish are not real parts of that whole but elements which have a considerable degree of abstraction. They are obtained using a specific symbolic apparatus and are distinguished only from a given perspective ("paradigm" we would say nowadays). Therefore, concludes Bergson, it is highly misleading to believe that on rejoining those elements we shall obtain an adequate representation of the original whole. This does not mean, says Bergson, that the analytic-synthetic method — which he, like Descartes, considers to be the characteristic method of science — will not supply any type of knowledge. On the contrary, it certainly does supply knowledge, although "external," of the objects being studied. This knowledge moreover, is all we need for practical purposes. For a profound knowledge of reality, however, the analytic-synthetic method is, according to Bergson, completely inadequate and should be replaced by intuition, which is a direct, experiential, non-symbolic way of knowing the essence of an object.

It is easy to smile at Bergson's intuitive omnipotence. But although he was surely wrong about the infallibility he attributed to intuition, what we know today about the process of scientific discovery makes it difficult to accept that Cartesian-type stories can give a full account of what really happens. Just as it is hardly believable that a cognitively important result can be due solely to intuition, neither is it true that it can be attributed entirely to the application of the analytic-synthetic method. Actually, this method is incapable of telling us, at least only by itself, whether what we analyze and synthetize is trivial or really significant — so, the progress of knowledge seems to require something more than analysis and synthesis.

I think that the foregoing is true also for the physical sciences. Let me take a famous example. At the age of 23, Newton conceived the idea — we do not know to what extent helped by the fall of an apple — that it is the same force which holds the planets and the moon in their orbits, which causes the tides and which causes a body to fall to the earth when left without support. He also thought that, being the same force, it should in all cases work according to the same mathematical law. He thus found the mathematical law of gravity and extended it to any two bodies in the universe, unifying in this way terrestrial and celestial mechanics developed respectively by Galileo and Kepler. Starting from this point, Newton constructed an axiomatic system endowed with an extraordinary analytic and synthetic power and which could be viewed as a

beautiful illustration of the Cartesian method. But the fundamental ideas were certainly not obtained by only following a Cartesian strategy. The prodigious leap of imagination which they suppose lead us to suspect the presence of some creative demon, which could perhaps be called intuition although not surely Bergsonian intuition since it must have been an intuition happily and closely mixed in Newton's mind with the mathematical apparatus which he developed.[3]

II. OPEN, INTERWOVEN SYSTEMS AND HUMAN SCIENCES

Newton's mechanics and other great achievements in the physical sciences involve the selection of a set of variables and, on this basis, the construction of a theory which is at the same time wide in scope and empirically well supported. The conjunction of all these features is no doubt more difficult to find in the human sciences than in the physical sciences. A major reason for this difference lies, in my opinion, not so much in allegedly intrinsic virtues of the method which physical sciences follow but rather in the nature of the systems they study.

While they generally are open systems, as in the human sciences, their degree of openness is very often low and they can be considered, without great distortion, as if they were closed. Such is the case, for example, of the solar system or a system of chemical reactions in a test tube. When this condition is not met, i.e., when the physical systems are not quasi-closed, the result tends to be that the corresponding physical sciences are relatively less advanced, as occurs for example with meteorology.

In fact, human sciences are very often faced with extremely open systems. Personality, small groups, urban or rural communities, are systems in which it can be very difficult to draw a clear-cut distinction between what is internal and what is external. In view of this, different types of compromises take place. Some people, dazzled by its success in the physical sciences, cling to a blind application of the analytic-synthetic method (or of its empirical translation, the experimental method) assuming that it has the magic virtue of dignifying all that is done in its name. In this way they attempt to isolate simple elements in every area, the simplest possible ones as Descartes wanted, and subsequently to combine them until they can account for the complexity of the reality being studied. Behaviorism is a classic example of this strategy. In their search for the atoms of behavior, several generations of behaviorists devoted themselves to torture systematically many more generations of rats in order to carefully measure their responses to carefully chosen and controlled stimuli. In spite of so much care, however,

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after various decades of sustained efforts the building of a bridge between laboratory rats and human beings could not even be commenced.

There are also other people who, although followers of the analytic-synthetic method, see clearly that its successful applications depends on an adequate systemic framework. Faced with the difficulty of constructing such frameworks in the human sciences, their strategy consists of making the typical move of the physical sciences, i.e., to consider open systems as if they were closed. Thus, personality, small groups, economic, political and other human systems have been approached in this way. Mutually independent sets of psychological, economic, political and other kinds of variables have been stated and different theories were constructed using them. We have doubtless learned much from such attempts. However, we must recognize that these efforts have not been completely successful. It is relatively easy to show (and it has been shown) for every one of the great systems in the human sciences, from Freud to Parsons, that something very significant and relevant remains outside the picture, whether they are large realities like culture (in Freud) or concrete human beings (in Parsons) or more abstract categories of processes such as conflict or change. And these shortcomings of theoretical systems in the human sciences become dramatically visible when they appear unable to explain — let's not say predict — certain facts which are then labeled as "anomalous" or "residual." So it is not strange that there are people who feel tempted to follow in the footsteps of Bergson and throw away, or at least relegate to a second place, the analytic-synthetic method and in general all the methods reminding one of the physical sciences. What happens, according to them, is that the object of physical sciences is completely different from that of human sciences. Therefore, they conclude, the method of approach must also be quite different. This point of view is upheld today for example by phenomenological-existential psychology, the so-called "third force" between behaviorism (asystemic application of the analytic-synthetic method) and psycho-analysis (systemism plus degradation of the analytic-synthetic method).

Ronald Laing, for example, says: "The natural sciences know nothing about the relation between behavior and experience. The nature of this relation is mysterious, in Marcel's sense of the term. In other words, it is not an objective problem. There is no traditional logic which expresses it, there is no method developed to understand its nature. . . . The relationship between experience and behavior is the cornerstone which the builders cannot omit without danger; without it the whole structure of our theory and our practice would collapse."[4] Abraham Maslow, on expressing his dissatisfaction

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with the exclusive application of the analytic-synthetic method, states: "To the seeker for knowledge about persons, abstract knowledge, scientific laws and generalizations, statistical tables and expectations are all useful if they can be humanized, personalized. . . . Not only must I perceive you holistically, but I must analyze you holistically rather than reductively."[5]

To sum up, these thinkers propose a holistic-experiential approach[6] to human reality. An attractive feature of some American defenders of this approach (Maslow, Rogers, May and others) is that they do not try to assign it exclusivity. Maslow, for example, advocates its integration with what he calls "verbal-conceptual knowledge."[7] As I have already suggested, I am also convinced of the need for integrating in the human sciences the analytic-synthetic and the holistic-experiential approaches. First of all, because I believe it is worth while to generalize a statement made by George Homans on introducing his study of small groups: "Nothing which can throw light on the group should be disregarded for doctrinary reasons. We are blind enough without having to voluntarily narrow our vision."[8] But my main reason in favor of the integration between the two approaches is that I think like Maslow, that the experiential-holistic way to knowledge is in the human sciences at least as important as the analytic-synthetic way (in fact it is not absent either from the physical sciences, as shown, for example, by Arthur Koestler's exploration of the creative act or by Michael Ponanyi's research of personal foundations of scientific knowledge; but that is another story). It is enough to think of the role of clinical methods or participant observation in psychology and anthropology to realize the importance of the experiential and holistic approach in the building of human theories.

Turning again to our main problem — how to tackle successfully human systems — we have to admit that integration of analysis-synthesis and experiential holisis cannot be the final word. Such integration is essential to provide substance and meaning especially in the first steps of theory construction. But, as the level of abstraction becomes higher, experiential holisis becomes less feasible. So a new kind of integration will be necessary: an integration among different perspectives of the human scene. To develop this idea, let us return to the description of some general characteristics of human systems. I have already said that they are extremely open systems. I would now add that they are overlapping, or better, interwoven. What does that mean? It is not easy to convey the full meaning of this notion. I will only say that each human system is constituted, develops and is maintained in an environment constituted by other human systems,

both at its own level and at other levels of aggregation, with which is is intimately inter-connected.

If, for example, we take an individual human system — a person — it is clear that his processes of constitution, development and maintenance imply permanent interchange with other personal systems (his own level), with infra-personal systems (the biological level), and with supra-personal systems (the socio-cultural level). By the way, let us recall that close interweaving among systems also exists at the biological level. That is why the science of living systems and their environment — ecology — has not been able to restrict itself either to the classical strategy of the physical sciences.[9] Nevertheless, in human systems the presence of language and culture bring about complexities which are absent in other stages and pose original epistemological problems. For example, which is the role played in an individual system by the representation which the system has of itself? Therefore ecological strategy, although closer than that of physical sciences, cannot be completely adequate either for human sciences.

Hopefully, it is now clear that the interweaving among human systems makes it unwise to consider a personal system as if it were closed. But neither would it be wise to dissolve a personal system in the infra-, inter-, or supra-personal systems of which it forms part, denying it, so to speak, its own ontological status. And this because of two reasons: (1) because a personal system is not only made of up materials supplied by the infra-, inter-, and supra-personal systems with which it is interwoven (the experience of one's own body or of one's own mental states are examples of irreducible private dimensions), and (2) because a personal system is structured according to patterns which never exactly match the ideal patterns of its interpersonal and social environment. As someone once said, in certain aspects every man is equal to all other men; in other aspects he is equal to some men; but in certain other aspects he is not equal to any other man.

Similarly, the study of some given supra-personal system cannot be entirely satisfactory either if it does not take into account the systems of its same level and of other levels with which it is interwoven. So it must embrace, for example, the way in which the supra-personal system is represented in the mind of its concrete individual bearers. In other words, it does tackle the problem of the "construction of reality," as Alfred Schutz would say.

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I therefore advocate an integration between the different human sciences. But the integration I have in mind is a particular one. As it is usually conceived, integration is an attempt to coordinate the results which each discipline reaches separately. What is generally obtained is not a true integration but rather a mere juxtaposition. The integration I propose here must be started up long before, in the very development of each discipline. It does not imply, however, erasing inter-disciplinary differences. But it does imply that every human science ceases to be a closed universe. In my view, each discipline distinguishes from the others only by differences of emphasis within the total scope of human reality. Thus, psychology would be a discipline which puts more emphasis, focusses its attention on personal systems, but that does not mean that theory construction in psychology can simply ignore conceptualizations and theories arising from economics, politics, etc. And something equivalent can be said of economics, political science and the other human sciences. Only open, closely interwoven sciences can account for systems which are open and closely interwoven too.

III. SOPHISTICATED HOLISM: AN ALL-EMBRACING STRATEGY

Let me now try to add some flesh to this skeleton and think of all these things in the light of a future study entitled "Visions of Desirable Societies."

On the one hand, a title like that leads one to imagine large structures: the economic structure, the political structure, etc. of a desirable society. On the other, it brings to mind persons: how will their value priorities be, their beliefs and their style of communication with others and with themselves, etc. I will call those who are more prone to explore large social structures *socio-theorists*, while those more interested in small psychological structures will be called *psycho-theorists*. Socio-theorists tend to hold a none-too-high opinion of psycho-theorists, and vice versa.

Let us imagine a socio-theorist S at the moment of beginning his work on "Visions of Desirable Societies." When considering how to approach the subject, S decides to slice the total social structure to be constructed into partial structures (the economic structure, the political structure, etc.) and subsequently to relate these partial structures one with another in some way until obtaining the total picture. A strategy of this kind would be clearly an application of the analytical-synthetic method. It could give some good fruits. That depends, among other things, on S's ingenuity. Nevertheless, there are certain crucial aspects of a vision of a desirable society that this strategy will tend to leave aside, independently of how ingenious S could be. In the first place, it will tend to ignore the dimensions which do not belong in particular to any of the partial structures but rather to the social structure as a whole. Take, for example, the expansionism of J. Galtung's[10] "alpha" structures (large and vertical social structures). Expansionism is not a quality which could be attributed solely or primarily to any one of the partial structures referred to above. On the contrary, it cuts through all of them and we can say that it transcends them to become a quality of (Western) society as a whole. This does not mean that it is a ghostly or mysterious quality. As Galtung points out, there is an identifiable cycle which feeds expansion but it is a cycle

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which includes and unifies all the partial structures.

Secondly, the strategy followed by S will likely tend to generate a certain anti-psychological bias. In its extreme form, this bias will lead to neglecting altogether the relationships between large social structures and psychological microstructures and in its milder form it will make room for psychological microstructures but only considered as mere reflections of the large social structures.[11] In fact, S's anti-psychologism is not unconnected with its already mentioned disregard of qualities which cut across different partial structures since very often psychological variables have potentially this power. Consider, for instance, authoritarianism, or even better, the complex construct known as "social character." Social character is clearly a quality which stands in a feed-back relationship not with one social structure but with different social structures, from the economic to the psychological ones. Finally, a third trait of S's strategy would be its tendency to ignore, at least explicitly, the global, scarcely articulated and affectively colored vision of a desirable society which S as a human being, not as a faculty or research team member, probably has incorporated into his personal structure. That vision is the result of the more or less painful confrontation between S's potentialities and needs and his experience as a social being. It is an underlying, "tacit" vision as Michael Polanyi would say. By leaving it aside and neither nourishing his analysis with it nor checking his synthesis against it, S interrupts the explicit-tacit, conscious-subconscious cycle which endows knowledge with its richness and power.

To summarize, S's strategy leaves no room for the introduction of cross-cutting variables characterizing the social structure as a whole, for the integration of socio- with psycho-theory and for a dialogue between experiential vision and analysis.

Now let us turn to a psycho-theorist called P at the moment of starting to sketch a desirable society (or, more precisely, its members). We shall suppose that he decides to apply a strategy isomorphic with that of S; i.e., he slices the total personal structure into partial structures — for example, an affective-motivational system on the one hand and an information processing system on the other — and then he attempts to put together the total structure by summing up the partial structures and their relationships. (If P were a social psychologist, the procedure could be similar, although applied to small groups.) Now it is to be expected that once again some important things will remain outside the picture. As before, the dimensions that cut across the partial systems will be left out. The study of these dimensions, known as the psychology of personality, is in

our academic world just another speciality, and it happens that P is not a specialist in that. (For their part personality specialists also work on their own subject without bothering too much about the work of specialists like P.) In the second place P like S also tends to leave aside his daily experience of persons and groups. He substitutes experiments for experience. His utopic imagination is only fed by and checked against "hard" facts, not facts belonging to his diffuse experience of life.

Finally the socio-theory variables will tend to be left aside. Of course it will be accepted that a human being is inconceivable without a social context but this context will be considered more as a kind of frame than as an internal component of personal systems. The anti-psychological bias of S has its counterpart in the anti-sociological bias of P.

To summarize, P's methodology seems to be as inadequate as S's and for the same reasons. Therefore, it is to be expected that the visions of both will be equally unsatisfactory. Now, what would happen if we were to combine the visions of S and P? Could it not be that the faults of the one will be balanced by the virtues of the other and vice versa so as to obtain a single satisfactory vision? Unfortunately it can be expected that this will not be the case. Since neither S nor P make reference to properties which only result from the interplay of the whole system and not just some of its parts (let us call them *holistic properties*) it is difficult to see how these properties can emerge by combining visions in which they do not even appear.

But we can go one step further and suppose that S and P decide to incorporate, each in his own field, some of these holistic properties. Not even then can they provide us with what we are seeking: total and at the same time detailed and articulated visions of desirable societies. It happens that P, by neglecting the relationship of the person or the small groups with the large social structure, will not really be capable of providing us with a satisfactory vision of persons or small groups themselves. And S, being unaware of how the social structures are constructed in the mind (and in the body) of human beings, will lack knowledge of fundamental aspects of these same structures. For example, his account of the processes of reproduction and change of structures will be essentially incomplete.

The moral of this story is now obvious. If we wish to obtain epistemologically satisfactory visions of desirable societies, it is necessary to put together tools of the scientific-utopic imagination that customarily are kept separated: analysis-synthesis,

experiential holisis, socio- and psycho-theory. The tension between all these elements is apparent in such a wide subject as visions of entire societies. In some way, however, this tension is *always* with us when we are dealing with human systems. Hence the need of tension-reducing strategies, the need to integrate those opposing elements into a balanced epistemological system. It is clear that none of the elements referred to is sufficient by itself. In this paper I put emphasis on showing the insufficiency of analysis-synthesis but this does not mean that experiential holisis is sufficient. The complexity of human systems and their interweaving makes it unbelievable that true understanding of them can be obtained by means of an intuitive act, or even through a chain of intuitive acts. Analysis and synthesis are essential tools which must be put to work. At the same time, however, the approach I suggest does not expect to reach a representation of the system only at the end of the process of analysis and synthesis, but instead it introduces a holistic and experiential vision of the system at the very beginning. This vision is articulated and modified through analysis and synthesis until a holistic vision is obtained, which is in turn modified by further analysis and synthesis, and so on. This process eventually leads to a vision of human systems which is holistic but no longer experiential since analysis and synthesis have raised it to a high level of abstraction, very far from (but not alien to) immediate experience. I have once called[12] an understanding which produces this kind of visions a sophisticated holistic understanding. But you could perhaps find a better name.

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NOTES

1. R. Descartes, *Discours de la Méthode* (Paris: Libraire Philosophique J. Vrin, 1964), pp. 69-70. It should be remembered that Descartes considers that intuition should validate the point of departure and each of the steps of the deductions made in the process of analysis, but this sort of intuition is different from the holistic sort of intuition to which I refer later on.

2. Cf. H. Bergson, *Introducción à la Metafísica y la Intuición Filosófica* (Buenos Aires, 1956). The essay to which I refer particularly here — "Introduction à la Métaphysique" — appeared in 1903 in the *Revue de Métaphysique et Morale*.

3. I would like to quote here the words of Bernard Cohen, an outstanding historian of science and the director of the edition of Isaac Newton's scientific work. Referring to Newton's generalization of the law of gravitation to any pair of objects in the universe, Cohen says: "There are no mathematics — whether algebra, geometry or calculus — which would justify this audacious step. We can only say that it is one of those triumphs which inspire in the common man feelings of humility in the presence of genius." (*El Nacimiento de una Nueva Física* [Buenos Aires: Eudeba, 1961], p. 201. Original title: *The Birth of a New Physics* [New York: Doubleday, 1960].)

4. R.D. Laing, *Experiencia y Alienación en la Vida Contemporánea* (Buenos Aires: Paidós), pp. 17-18. Original title: *The Politics of Experience* (New York: Pantheon, 1967).

5. A. Maslow, *The Psychology of Science* (New York: Harper, 1966), pp. 11.

6. I differenciate "holisis" from "synthesis" and "experiential" from "experimental." Holisis differs from synthesis in that it does not, or does not necessarily, pass through a prior stage of analysis. And "experiential" differs from "experimental" in that the former adjective refers to a natural real context and experience taken as a whole while the latter refers to a controlled artificial setting in which only small portions of experience are taken into account.

7. Carl Rogers has taken some concrete steps in this direction. Cf. C. Rogers, "Toward a Science of the Person," in T. Wann, ed., *Behaviorism and Phenomenology* (Chicago: University of Chicago Press, 1964); also included in O. Nudler, ed., *Problemas Epistemológicos de la Psicología* (Mexico: Trillas, 1978).

8. G. Homans, *El Grupo Humano* (Buenos Aires: Eudeba, 1963), p. 50. Original title: *The Human Group* (New York: Harcourt, 1950).

9. Cf. G. Gallopin, "Los Componentes Biológicos de los Sistemas Ecológicos y las Actividades Humanas" (Fundación Bariloche, 1977).

10. J. Galtung, "Alternative Visions of Desirable Societies," Part II, presented at a meeting of the GPID Project, Mexico, 5-8 April 1978.

11. In connection with this last kind of anti-psychologism in social theory, let us quote from Gouldner's comments on Parsons' system: "Although Parsons is at pains to stress the different

levels of integration and analysis (the biological, psychological, cultural and social system levels), in none of them there is a conceptual provision made that would focus directly and systematically on a human system. . . . In Parson's social world, the human system, the embodied socialized individual, is not recognized outside the other four levels. The human system disappears in Parson's framework. . . . It is as if the obvious existence of people is an embarrassment as his theoretical system develops, especially as it moves from action scheme to social system analysis, the embodied and socialized individual is lost from sight." A. Gouldner, *The Coming Crisis of Western Sociology* (New York: Basic Books, 1970), pp. 223-24.

12. O. Nudler, "The Person as a System: Towards a Theory of Human Needs," presented at a meeting of the GPID project on Human Needs, Berlin, 28-30 May 1978.