

“The Whole and Its Parts”, *Nature and Systems*, 1, 1979, 32-6

## **The Whole and Its Parts**

*Joseph Agassi*

Ever since I began my philosophical studies, I learned that one of the major issues in perennial philosophy is whether the whole equals its parts or is more than its parts. That never ceased to puzzle me: I had no doubt that we are all agreed that in one sense the whole is the sum of its parts, in another sense not. To give the simplest example let us consider a machine, a simple machine such as a mere clock. The party that says the whole is the sum of its parts says that in a machine there is nothing more to the whole than its parts: to know each and all parts of a machine is to know it all: and their opponents say, oh no: the machine is soulless; we are not. What this little debate amounts to is that both parties agree on two fundamental theses. First that machines are sums of their parts: second, that living things are mysterious if viewed as more than the sum of their parts. Those who view every whole as the sum of its parts insisted that each whole is nothing more mysterious than a machine, a mere clockwork. They even viewed the whole universe as such; they were called mechanists. Their opponents were called organicists. They agreed with the mechanists about the machine: a machine, they conceded, is indeed nothing mysterious and is no more than the sum of its parts. They agreed that a non-functioning organism, a dead animal, a dead person, for example, is only the sum of its parts, yet a living person is *more* than that: that is to say, the anti-mechanists declared that an animal, particularly a human being, has a soul that is mysterious, because it is not any part of the human being: it is the whole of a human being minus each of his parts. It is the added extra, yet it is not an extra part. Proof: were the soul a part proper, a real entity, then putting body and soul together would make a whole that equals its parts. The organicist's conception of the soul is viewed by all as mysterious, not the mechanist's conception. There is much confusion in the literature about the little that I have thus far said. For example, what I said makes it clear that Descartes was a mechanist, both with respect to the soulless organisms like cats and dogs, and with respect to organisms endowed with souls, namely human beings. Likewise, what I have said makes it clear that those who deny Descartes' view on the existence of the soul may be mechanists who view the human being as a machine more akin to cats and dogs than Descartes thought: but they also may be organicists who simply deny that the soul is a cog in a machine as an arm or a leg or a neuron may be. and who claim that the living body is living by virtue of the proper though mysterious coordination between all its cogs. Thus, a philosopher like Gilbert Ryle who is viewed as a mechanist because he says it is a category mistake to compare the soul to the arm or the liver, such a philosopher is an organicist, plain and simple.

The really plain cause for the confusion is, as often is the case, that both parties are clearly in error and the confusion usually come to mask the two joint mistakes: making machines soulless and making souls mysterious. The obvious fact is that the organicist makes a serious mistake when conceding to the mechanist that machines

are not organisms. For, just as a living human being is an organism, whereas a dead corpse is not, so a motor that purrs merrily and roars when it performs a heavy task is more alive than when it rusts on a junk heap. Not only that. The organicists should concede something to the mechanists. The organicists make a big thing about the fact that biologists, unlike engineers, have no spare parts. Yet spare parts have been invented, not only mechanical ones such as the hooks that replace arms and the spectacles that replace a removed defective cornea; there are spare parts that integrate in the system, such as infused blood. and even transplants that take, from skin grafts to heart transplants, particularly artificial transplants, such as pace-makers.

Once we admit that even a machine has a structure that is essential to its operation as a machine, we are willing to view the soul as less than mysterious. In particular, we are tempted to identify the soul with the proper structure, where the proper is what functions. Of course, function is one point about the propriety of a structure: the starting point. Quite another is the detail: the cogs are placed where and act how (the laws of force and of motion of the parts, as it were); when do parts act so that their interaction coordinates to produce the function, which is our starting point. And so it is not surprising that in some cases we seek a defective cog and wish to replace it so as to restore a function, and in other cases we wish to synchronize the operations of the parts. In the case of malfunctions of the human bodies, their repair is called medicine and the ones who try to replace or eliminate defective parts are called surgeons and the others are called internists. Yet the surgeons claim that all ills are in principle best cured surgically. This claim of surgeons is called the medical model, or the externist view. Its opposite is called the generalist or organicist view.

Since, no doubt, there is room for both surgery and internal medicine, the dispute is not concerning here-and-now but the principle. Someone might say, give me the here-and-now and take the principle away. But this is rash; anyone who is satisfied with the here-and-now is either over-optimistic about our present abilities, or over-pessimistic about our chances to improve. And when we wish to improve we wish to come nearer to the principles of things and so, to the question how are things in principle, though not pertaining to the here-and-now, may well pertain to the here-and-tomorrow; to our immediate future, that is.

What I have said just now is, however, double-edged. On the one hand, clearly, a mechanist will attempt to extend knowledge, to push the frontiers of knowledge, in one direction and the organicist in another. For example, the mechanist will attempt to study transplants and the organicist will attempt to study hormones and histamines. Yet, on the other hand, each party cannot avoid using knowledge acquired through efforts along the lines of research of the other party. Not that they are not sensitive to it. For they constantly attempt to translate the achievements cast in the opponent's intellectual framework into their own. Indeed. often progress is attained just by the lucky translation from the one system to the other. Of course, each achievement calls for a counter-achievement.

If so, it looks as if despite all progress the two grand ideas that serve as intellectual frameworks remain utterly unchanged. But this too is a gross over-simplification. For, the more success takes place within any framework, particularly through a translation from one to another, the clearer we are about the disagreement. This may lead to the conjecture that finally the difference between the two will disappear. This is possible. But also possible is that a supposition common to both will be contradicted, thus leading to a new framework that might compete with the two traditional ones, or with their synthesis, or with some entirely different newcomer. Examples are extant, though the paucity of frameworks in human history makes it hard to multiply examples.

The mechanists in the social sciences saw society as comprising individuals and their program was psychologism: reduce any worthwhile achievement in any social study to psychology proper, i.e., to the study of individual people and their interactions. The organicists or generalists saw society as more than a mere aggregate of individuals, namely, as integrated, well-functioning aggregates: these are the collectivists, the holists, the ones who, on the contrary, reduced psychology to the psychology of the national type, i.e., to sociology. For a collectivist like Durkheim, the laws of a society represent the excess the whole has over its parts without the law being an added cog in the social machinery. And, of course, one can add that the law is holistic, not only in society, but also in nature. Thus, to take Popper's example, even a heap of gravel has certain holistic qualities, such as layers of equal pressure, of equal gravitational potential, and other holistic qualities. Indeed, the funny thing is, logicians now insist on this: liquidity is not a quality of a molecule, but a quality of its molecular force. i.e., of its interaction with its surrounding sisters; an ensemble has, as ensemble, qualities that are not showed by its members; for example, the members are members of the ensemble, but not members of themselves; in brief, most of what can be said of a whole or of one of its members cannot be said of the member or of the whole. The boot seems to be on the other foot: whereas mechanists and holist wondered at the fact that the whole has qualities not showed by any of its parts, logicians now insist that this must be trivially so.

But I check myself. First and foremost, when logicians discovered this fact they were puzzled and mystified. Only with the new logic, whether Russell's paradox or his axiom of reducibility, or his theory of definite description, only with the new logic did this feature become clear. Moreover, the law that amalgamated the parts into the whole, is a law that denies holism: it is a law of conservation — you get out of a bag no more than you put into it. This is why Descartes and Leibniz and Newton all stressed their laws of conservation so much. This is why the discovery of Lagrange and Laplace that Newton's system conserves not only momentum, but also energy, is important. Nevertheless, when Hamilton reversed the logic and derived the Newtonian system from the laws of conservation, his formulation became canonic at once.

It must be admitted, I think, both that mechanism was ingenious and that it was a militant resistance to obscurantism. It also must be admitted that it failed and that we need not oppose any obscurantism, least of all by denying a thesis that looks obscurantist. The thesis that the whole is more than its parts is put in a mystifying language, and so it calls for objection; but nevertheless it is trivially true.

What is not trivial is the study of emergence of more whole-like and less whole-like wholes: how does a machine synchro mesh its gears? Why and how is an organism more and better coordinated than a machine? What makes a human able to think abstractly, whereas neither robots nor simians can? This is the direction at which present research seems to point at. And it would not be possible for us to even attempt to develop ideas in this direction if we could not develop first the idea of partial success in science which permits us to see partial justice in both the mechanistic and the holistic view. Indeed, as a result, the holistic view became structuralist and the mechanists have learned to live with structure though, of course, they still stress the importance of individual components in preference to their roles in given structure.

Still, this ought to be said: a compromise between mechanism and holism is a victory for holism. For, whereas mechanists equate the whole with the sum of its parts, the holists simply speak of inequality. And equality is not as given to compromise as inequality. And yet, mechanists can modify their view and demand that each whole is bound by a structure, where the structure places every part of the whole in its place as a part contributing to the whole its own specific partial service. The question, then, is how much mechanism is given to modification so as to allow for new views of emergence? The question is, is emergentism necessarily structuralist or holist, or can we develop mechanistic emergentism? This is where we are at — all of us. For, when holism becomes trivially accepted, we will want to develop it in more detail, and this can be done in competing ways. Hence, the variety of structuralist philosophies in recent times.

Boston University and Tel Aviv University