UNITY OF NATURE

How far can Science be influenced by Metaphysical consideration is evident by its erstwhile concept of the Unity of Nature. From its earliest beginnings, philosophy has concerned itself with the problem of One and Many ; and almost all notable phlosophers of the past have lent the weight of their authority to the One rather than to the Many. Monism in one form or the other has remained the dominant tendency of Philosophy and if ever the claims of the Many had to be recognized, this was done reluctantly, often as an after-thought in the form of Unity in diversity rather than in the form of Diversity in Unity.

Following in the footsteps of Metaphysics the philosophers of science have conceived of Nature as a Unity, that is to say, One rather than Many. After having accepted the monistic viewpoint in science, it became incumbent upon scientists to clarify the notion of Unity as it applied to physico-chemical sciences and their derivatives. This was by no means an easy task. A scientist has no philosophic training and therefore fares badly whenever he is called upon to attempt a task which does not fall within the purview of factual, empirical sciences. Whenever a scientist becomes a philospher without necessary equipments, he fails, as can be seen from the pseudo-philosophic interpretations of Freud, Jung, Eddington, Sir James Jeans and many other philosopher-cum-scientists.

Little attempt was made to explain Nature. It was left to the imagination of the reader to understand Nature in what ever way he liked. Nature was conceived to be a vast conglomeration of events among which a scientist was required to discover or to introduce order. According to Wittgenstein, Nature is a totality of facts and a fact is, as the case may be. Among the so-called totality of facts, it was the business of a scientist to establish some sort of relationship. For this purpose the law of causation and the hypothesis of the Uniformity of Nature were invoked. It was thought that three kinds

of unities were possible. These were roughly speaking, the Aggregate, the Mechanical unity and the Organic Whole. An Aggregate signifies a collection of things in a certain spatio-temporal context. The things happen to be in the same place and exist at the same time. But beyond this context of time and space, there is no other relationship that can be conceived of as binding the multiplicity of objects or events.....The removal of an item from the existing one's or the inclusion of a new item in the one's already present, leaves the other items undisturbed or uninfluenced.

What is true of the Aggregate is not true of the Mechanical Whole or the Organic Unity. A machine exhibits the nature of a mechanical whole. The parts of a machine are not simply juxtaposed, they are, on the other hand, so arranged and adjusted as to indicate the characteristic unity and balance of the machine concerned. There is interdependence and mutual co-operation in the parts. Consequently malfunctioning or cessation of activity on the part of any one seriously hampers the efficiency of the machine as a whole or puts the machine out of order. A watch is a Mechanical Whole. A small defect in any of its screws affects the machine as a whole. Unless the defect is removed, the watch refuses to work properly.

Human organism is an example of Organic Whole. Its organs have a greater degree of interdependence and mutual co-operation than that of a machine. It is said in one of the Aesop's fables that once all the organs of the human body rebelled against the belly saying, that all day long it is they who had to put in strenuous labour to earn living but all the nice things that were taken went to the belly which, to all intents and purposes did no work. Consequently they resolved that they would not in future feed such an idler. As no food went to the stomach, the hands, feet, eyes and other parts of the body began losing their energy and vitality. The hands, feet, eyes and other parts became weaker and weaker day by day and then they realized that the belly was not an idler but had an important function to perform in the survival and continuance of life. This fable shows the interdependence as well as the xtreme importance of every part of the body.

So for as interdependence and co-operation are concerned, both machine and organism stand on the same footing. But there are two characteristics which distingusih the two and puts the organism on a higher plane. One is the quality of self-repair, the other is that of reproduction. An organism can repair to some extent what ever damage it has received and can also reproduce its own species. A machine does not repair itself and does not reproduce its own speices. If a watch is damaged and left to itself, it cannot correct its defects no matter how long it is left in that condition. Moreover it cannot reproduce a little watch like itself.

In case the Universe is regarded a Unity of some sort, it shall have to be shown that it is either an aggregate or a mechanical whole or an organic unity. The first alternative is not acceptable to metaphysicians of the older type, as it reduces the world into a multiplicity of objects or events among which no relationship except that of temporal simultaneity or spatial contiguity can be discovered. It was the pluralist who maintained that the wolrld could be conceived as a conglomeration of events which stood apart and independent of one an other. Russell, for instance, has held in his theory of Logical Atomism that the atomic propositions which constituted the primary stuff out of which the logical construction of the universe was attempted, were nothing but a medley of statements and assertions, whose nature was, in the old Aristotelean language, that of particulars. But the Pluralists do not constitute majority in the electoral world of philosophy, and therefore the field very much remains in the hands of the Monists who favour either the conception of a mechanical whole or that of organic unity. These conceptions as applied to the universe stress the interdependence of event which constitute the totality of facts known as the world. The nature of interdependence differs according as we accept the analogy of a machine or that of an organism. The difference, though trivial on the face of it, becomes significant in the final rendering of the univese, and lead to major philosophical conflicts. What is however important to us as logicians is not the philosophical interpretation of the universe but the idea of interdependence which welds together the seeming multiplicity of the universe into unity and gives rise to the notion of the Unity of Nature.

Those who conceive the universe on the analogy of watch, that is to say a machine or on the analogy of a human body that is to say an organism put forward another theory, very much interesting and significant. The theory concerns the nature of interdependence or relationship that exists between the events of the world. It is held that relations are of two types, one internal and the other external. In the case of the former the relations are constitutive, essential and basic, while in the later case, the relations are trivial, superficial, transitory and inessential. Speaking in the language of the old Aristoteleans, a relation is internal if it is of the nature of a definition or proporium, while it is external if it is of the nature of an accident. The definition explicates the essence of a thing and the proprium draws out of the implications of the essence. Hence if the relation is of the nature of a definition of that of a proprium, it would be constitutive and therefore, internal. In the case of accident the relationship is trivial, transitory, and superficial, hence it is external. The monists, particularly the Idealists hold that the relations among events are internal while the pluralists hold that they are external. Russell subscribes to the pluralists view and people like Taylor, Bradley, Boasanquet and Hegel, to wit, the Idealists, subscribe to the Monists view.

Without entering into any philosophical discussion regarding the merits and demerits of the rival theories, it can be safely held that the present age favours discontinuities and chance more than continuities and regularities. Scientific laws are built more often than not on the basis of frequencies than on the basis of continuities. Hence the monistic hypothesis is not so helpful to science as the pluralistic one is. The counting of changes and frequencies is compatible with the presence of multiformity and triviality in the nature of relations. Hence, scientifically considered, there is no ground for holding that the universe is one in the sense that the different relations which bind the events together are constitutive or internal. It is quite conceivable that the relatins in themselves are trivial but that for purposes of scientific interpretation they admit themselves to statistical formulations. In other words, the discussion whether the universe is one or many or whether monistic or

pluralistic hypothesis depict the nature of ultimate realtity is quite pointless. Nature is neither one nor many, it is totality of facts, and the facts can be computed and statistically rendered.

The Logical Positivists have tried to account for the unity of Nature through their theory of Physicalism. They believe that the language of all sciences is ultimatley reducible to the language of Physics. By 'reducing' they mean translating the sentence of one science in the sentence or sentences of another science and in doing so no violence is to be done to the implication and the sense of the original. In other words the denotation and connotation of the former should remain identical to the connotation and denotation of the later. In the language of Moore the analasyan and the analysundum can be said to have the same sense if where analyasyan can be applied, there the analysundum can be applied and where the analysan cannot be applied there the analysundum cannot be applied. Thus the range of applicability and also the significance of the range should be identical in the case of the sentence to be reduced and the reducing sentences.

In the beginning the Logical Positivists were hopeful of achieving identical statements. They thought that a sentence could be reduced into a sentence or a set of sentences and that in doing so there was no loss in meaning —in fact the meanings remained the same. But they soon realized that this was an ideal, impossible to be achieved, for no sentence or set of sentences can ever exhaust the meaning of another sentence, particularly so when the sentences belong to two different disciplines. You can reduce the sentences of Sociology to those of Psychology by splitting a group into the number of individuals constituting that group. Let us suppose that a group consists of five individuals and that we say about this group that it is rowdy. If we attempt a reduction of the sentence that the group is rowdy, we shall have to say that A is rowdy, B is rowdy C is rowdy, D is rowdy, E is rowdy. But it will be evident that the five reducing sentences do not catch the sense and the implication of the original sentnec e. In saying that the group was rowdy, my intention was not to make a statement about each individual severally. The statement is about the group as a whole and not about any individual

in his individual capacity. Likewise if the sentences of Psychology are reduced to those of Biology, the reduction will be correct up to a point. It will not exhaust the psychological sense of the original sentnece. Similarly when we reduce the sentences of Biology of those of Chemistry and the sentences of Chemistry to those of Physics, our reduction never conveys the complete sense.

It therefore seems to me that Physicalism cannot offer a satisfactory explanation of the Unity of Nature. To overcome the defects of reductionism, some people propose the idea of the Commonwealth of Sciences instead of the idea of Unified Sciences. The trem Commonwealth is borrowed from Politics. In the Commonwelth of Nations each nation agrees to accept some terms and conditions of the group without sacrificing its own soverignity. On this hypothesis each science remains an automonus discipline but submits itself, willingly, to an over-all control. It may be said that there are certain requirements which all sciences have to fulfill and to that extent each science shall have to part with its own soverignity and to accept the general control.

What those general requirements are, have been discussed by philosophers of science. The first to discuss these requirements was Aristotle. In the Topics, he discusses such conditions as all sciences *qua* sciences held to fulfill. Aristotle's discussion is very fragmentary and even perfunctory on these issues. But there is no doubt that he paved the way for the consideration of those conditions which all sciences had to fulfill, irrespective of their subject matter and methodology. Later discussions on this point have not proved very helpful, for it is very doubtful if all sciences can be made to submit to the same overall control, no matter how broad-based that control or its conception be. During Aristotle's time the number of sciences was small and their purposes very much alike. Consequently they could be harnessed together. But with the passage of time, the number of sciences has multiplied and their objectives have become diverse, so that it has become increasingly difficult to put them together on some common platform. There are at present different constellation of sciences and what is ture of one constellation need not be true of another constellation. Some

of the constellations are Physico-Chemical sciences, Biological sciences, Psychological sciences, Sociological sciences and Historical sciences. Each constellation has a unique character. Consequently what is applicable to one fails to apply in the other case. It was for this reason that reductionsim was found defective.

As an example we take the experimental and historical sciences. In the first case the substantive 'I' has been eliminated, in the second case the substantive 'I' is the most important factor to be recknoned with. Supposing an elephant is to be kicked down from the top of a mountain and a scientist is required to calculate the amount of time which the elephant will take in reaching the base. The physicist will start answering the question by reducing the elephant's body into mass. Then he will calculate the amount of acceleration which this amass will acquire and also calculate the amount of resistance which it will meet in its descent. He will also use some complicated mathematics and then conclude when that mass will reach the base. In this calculation the poor elephant will be forgotten. The scientist will be concerned with the mass, acceleration, resistance, so on and so forth. When this method is introduced in Biology, Psychology and Sociology, the substantive 'I' that is to say, the persons disappear and one starts talking in terms of reactions, stimulii, conditioned responses, tropisms etc. The individual is reduced into characteristics or set of characteristics and the scientist deals with the recurrent feature of such characteristics. These characteristics are scientifically labelled, the specifications of these characteristics are also accurately mentioned, but the indivudual or the individuals whose characteristics have been abstracted are completely forgotten.

In Historical sciences the substantive 'I' is the most significant factor. While no one can deny the force of movements in the history of human thought, it would be travesty of facts to ignore altogether the influence or the contributions of individuals in the making or marring of human destiny. It may be true that a peron is caught up in the whirlpool of Communism, or Capitalism, or Fascism or Imperialism and thus became a mouthpiece or an instrument of that, but I do not think that is the whole story. There have

been great men in every field of human activity-prophets, reformers, despots, dictartors who have changed the course of human history by their deeds. Hence in Historical sciences where the substantive 'I' is absolutely essential, it is not advisable to follow the methodology of experimental sciences.

It therefore seems to me that the idea of the Unity of Sciences is unworkable at the present stage of scientific knowledge.