

# Bohm

Wholeness and the Implicate Order

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## FRAGMENTATION AND WHOLENESS

The title of this chapter is 'Fragmentation and wholeness'. It is especially important to consider this question today, for fragmentation is now very widespread, not only throughout society, but also in each individual; and this is leading to a kind of general confusion of the mind, which creates an endless series of problems and interferes with our clarity of perception so seriously as to prevent us from being able to solve most of them.

Thus art, science, technology, and human work in general, are divided up into specialities, each considered to be separate in essence from the others. Becoming dissatisfied with this state of affairs, men have set up further interdisciplinary subjects, which were intended to unite these specialities, but these new subjects have ultimately served mainly to add further separate fragments. Then, society as a whole has developed in such a way that it is broken up into separate nations and different religious, political, economic, racial groups, etc. Man's natural environment has

correspondingly been seen as an aggregate of separately existent parts, to be exploited by different groups of people. Similarly, each individual human being has been fragmented into a large number of separate and conflicting compartments, according to his different desires, aims, ambitions, loyalties, psychological characteristics, etc., to such an extent that it is generally accepted that some degree of neurosis is inevitable, while many individuals going beyond the 'normal' limits of fragmentation are classified as paranoid, schizoid, psychotic, etc.

The notion that all these fragments are separately existent is evidently an illusion, and this illusion cannot do other than lead to endless conflict and confusion. Indeed, the attempt to live according to the notion that the fragments are really separate is, in essence, what has led to the growing series of extremely urgent crises that is confronting us today. Thus, as is now well known, this way of life has brought about pollution, destruction of the balance of nature, over-population, world-wide economic and political disorder, and the creation of an overall environment that is neither physically nor mentally healthy for most of the people who have to live in it. Individually there has developed a widespread feeling of helplessness and despair, in the face of what seems to be an overwhelming mass of disparate social forces, going beyond the control and even the comprehension of the human beings who are caught up in it.

Indeed, to some extent, it has always been both necessary and proper for man, in his thinking, to divide things up, and to separate them, so as to reduce his problems to manageable proportions; for evidently, if in our practical technical work we tried to deal with the whole of reality all at once, we would be swamped. So, in certain ways, the creation of special subjects of study and the division of labour was an important step forward. Even earlier, man's first realization that he was not identical with nature was also a crucial step, because it made possible a kind of autonomy in his thinking, which allowed him to go beyond the

immediately given limits of nature, first in his imagination and ultimately in his practical work.

Nevertheless, this sort of ability of man to separate himself from his environment and to divide and apportion things ultimately led to a wide range of negative and destructive results, because man lost awareness of what he was doing and thus extended the process of division beyond the limits within which it works properly. In essence, the process of division is a way of thinking about things that is convenient and useful mainly in the domain of practical, technical and functional activities (e.g., to divide up an area of land into different fields where various crops are to be grown). However, when this mode of thought is applied more broadly to man's notion of himself and the whole world in which he lives (i.e. to his self-world view), then man ceases to regard the resulting divisions as merely useful or convenient and begins to see and experience himself and his world as actually constituted of separately existent fragments. Being guided by a fragmentary self-world view, man then acts in such a way as to try to break himself and the world up, so that all seems to correspond to his way of thinking. Man thus obtains an apparent proof of the correctness of his fragmentary self-world view though, of course, he overlooks the fact that it is he himself, acting according to his mode of thought, who has brought about the fragmentation that now seems to have an autonomous existence, independent of his will and of his desire.

Men have been aware from time immemorial of this state of apparently autonomously existent fragmentation and have often projected myths of a yet earlier 'golden age', before the split between man and nature and between man and man had yet taken place. Indeed, man has always been seeking wholeness – mental, physical, social, individual.

It is instructive to consider that the word 'health' in English is based on an Anglo-Saxon word 'hale' meaning 'whole': that is, to be healthy is to be whole, which is, I think, roughly the

equivalent of the Hebrew 'shalem'. Likewise, the English 'holy' is based on the same root as 'whole'. All of this indicates that man has sensed always that wholeness or integrity is an absolute necessity to make life worth living. Yet, over the ages, he has generally lived in fragmentation.

Surely, the question of why all this has come about requires careful attention and serious consideration.

In this chapter, attention will be focused on the subtle but crucial role of our general forms of thinking in sustaining fragmentation and in defeating our deepest urges toward wholeness or integrity. In order to give the discussion a concrete content we shall to some extent talk in terms of current scientific research, which is a field that is relatively familiar to me (though, of course, the overall significance of the questions under discussion will also be kept in mind).

What will be emphasized, first of all in scientific research and later in a more general context, is that fragmentation is continually being brought about by the almost universal habit of taking the content of our thought for 'a description of the world as it is'. Or we could say that, in this habit, our thought is regarded as in direct correspondence with objective reality. Since our thought is pervaded with differences and distinctions, it follows that such a habit leads us to look on these as real divisions, so that the world is then seen and experienced as actually broken up into fragments.

The relationship between thought and reality that this thought is about is in fact far more complex than that of a mere correspondence. Thus, in scientific research, a great deal of our thinking is in terms of *theories*. The word 'theory' derives from the Greek 'theoria', which has the same root as 'theatre', in a word meaning 'to view' or 'to make a spectacle'. Thus, it might be said that a theory is primarily a form of insight, i.e. a way of looking at the world, and not a form of knowledge of how the world is.

In ancient times, for example, men had the theory that celestial matter was fundamentally different from earthly matter and that it was natural for earthly objects to fall while it was natural for celestial objects, such as the moon, to remain up in the sky. With the coming of the modern era, however, scientists began to develop the viewpoint that there was no essential difference between earthly matter and celestial matter. This implied, of course, that heavenly objects, such as the moon, ought to fall, but for a long time men did not notice this implication. In a sudden flash of insight Newton then saw that as the apple falls so does the moon, and so indeed do all objects. Thus, he was led to the theory of universal gravitation, in which all objects were seen as falling toward various centres (e.g. the earth, the sun, the planets, etc.). This constituted a new way of looking at the heavens, in which the movements of the planets were no longer seen through the ancient notion of an essential difference between heavenly and earthly matter. Rather, one considered these movements in terms of rates of fall of all matter, heavenly and earthly, toward various centres, and when something was seen not to be accounted for in this way, one looked for and often discovered new and as yet unseen planets toward which celestial objects were falling (thus demonstrating the relevance of this way of looking).

The Newtonian form of insight worked very well for several centuries but ultimately (like the ancient Greek insights that came before) it led to unclear results when extended into new domains. In these new domains, new forms of insight were developed (the theory of relativity and the quantum theory). These gave a radically different picture of the world from that of Newton (though the latter was, of course, found to be still valid in a limited domain). If we supposed that theories gave true knowledge, corresponding to 'reality as it is', then we would have to conclude that Newtonian theory was true until around 1900, after which it suddenly became false, while



relativity and quantum theory suddenly became the truth. Such an absurd conclusion does not arise, however, if we say that all theories are insights, which are neither true nor false but, rather, clear in certain domains, and unclear when extended beyond these domains. This means, however, that we do not equate theories with hypotheses. As the Greek root of the word indicates, a hypothesis is a supposition, that is, an idea that is 'put under' our reasoning, as a provisional base, which is to be tested experimentally for its truth or falsity. As is now well known, however, there can be no *conclusive* experimental proof of the truth or falsity of a *general* hypothesis which aims to cover the whole of reality. Rather, one finds (e.g., as in the case of the Ptolemaic epicycles or of the failure of Newtonian concepts just before the advent of relativity and quantum theory) that older theories become more and more unclear when one tries to use them to obtain insight into new domains. Careful attention to how this happens is then generally the main clue toward new theories that constitute further new forms of insight.

So, instead of supposing that older theories are falsified at a certain point in time, we merely say that man is continually developing new forms of insight, which are clear up to a point and then tend to become unclear. In this activity, there is evidently no reason to suppose that there is or will be a final form of insight (corresponding to absolute truth) or even a steady series of approximations to this. Rather, in the nature of the case, one may expect the unending development of new forms of insight (which will, however, assimilate certain key features of the older forms as simplifications, in the way that relativity theory does with Newtonian theory). As pointed out earlier, however, this means that our theories are to be regarded primarily as ways of looking at the world as a whole (i.e. world views) rather than as 'absolutely true knowledge of how things are' (or as a steady approach toward the latter).

When we look at the world through our theoretical insights,

the factual knowledge that we obtain will evidently be shaped and formed by our theories. For example, in ancient times the fact about the motions of the planets was described in terms of the Ptolemaic idea of epicycles (circles superimposed on circles). In Newton's time, this fact was described in terms of precisely determined planetary orbits, analysed through rates of fall toward various centres. Later came the fact as seen relativistically according to Einstein's concepts of space and time. Still later, a very different sort of fact was specified in terms of the quantum theory (which gives in general only a statistical fact). In biology, the fact is now described in terms of the theory of evolution, but in earlier times it was expressed in terms of fixed species of living beings.

More generally, then, given perception and action, our theoretical insights provide the main source of organization of our factual knowledge. Indeed, our overall experience is shaped in this way. As seems to have been first pointed out by Kant, all experience is organized according to the categories of our thought, i.e., on our ways of thinking about space, time, matter, substance, causality, contingency, necessity, universality, particularity, etc. It can be said that these categories are general forms of insight or ways of looking at everything, so that in a certain sense, they are a kind of theory (but, of course, this level of theory must have developed very early in man's evolution).

Clarity of perception and thought evidently requires that we be generally aware of how our experience is shaped by the insight (clear or confused) provided by the theories that are implicit or explicit in our general ways of thinking. To this end, it is useful to emphasize that experience and knowledge are one process, rather than to think that our knowledge is about some sort of separate experience. We can refer to this one process as experience-knowledge (the hyphen indicating that these are two inseparable aspects of one whole movement).

Now, if we are not aware that our theories are ever-changing

forms of insight, giving shape and form to experience in general, our vision will be limited. One could put it like this: experience with nature is very much like experience with human beings. If one approaches another man with a fixed 'theory' about him as an 'enemy' against whom one must defend oneself, he will respond similarly, and thus one's 'theory' will apparently be confirmed by experience. Similarly, nature will respond in accordance with the theory with which it is approached. Thus, in ancient times, men thought plagues were inevitable, and this thought helped make them behave in such a way as to propagate the conditions responsible for their spread. With modern scientific forms of insights man's behaviour is such that he ceases the insanitary modes of life responsible for spreading plagues and thus they are no longer inevitable.

What prevents theoretical insights from going beyond existing limitations and changing to meet new facts is just the belief that theories give true knowledge of reality (which implies, of course, that they need never change). Although our modern way of thinking has, of course, changed a great deal relative to the ancient one, the two have had one key feature in common: i.e. they are both generally 'blinkered' by the notion that theories give true knowledge about 'reality as it is'. Thus, both are led to confuse the forms and shapes induced in our perceptions by theoretical insight with a reality independent of our thought and our way of looking. This confusion is of crucial significance, since it leads us to approach nature, society, and the individual in terms of more or less fixed and limited forms of thought, and thus, apparently, to keep on confirming the limitations of these forms of thought in experience.

This sort of unending confirmation of limitations in our modes of thinking is particularly significant with regard to fragmentation, for as pointed out earlier, every form of theoretical insight introduces its own essential differences and distinctions (e.g., in ancient times an essential distinction was between

heavenly and earthly matter, while in Newtonian theory it was essential to distinguish the centres toward which all matter was falling). If we regard these differences and distinctions as ways of looking, as guides to perception, this does not imply that they denote separately existent substances or entities.

On the other hand, if we regard our theories as 'direct descriptions of reality as it is', then we will inevitably treat these differences and distinctions as divisions, implying separate existence of the various elementary terms appearing in the theory. We will thus be led to the illusion that the world is actually constituted of separate fragments and, as has already been indicated, this will cause us to act in such a way that we do in fact produce the very fragmentation implied in our attitude to the theory.

It is important to give some emphasis to this point. For example, some might say: 'Fragmentation of cities, religions, political systems, conflict in the form of wars, general violence, fratricide, etc., are the reality. Wholeness is only an ideal, toward which we should perhaps strive.' But this is not what is being said here. Rather, what should be said is that wholeness is what is real, and that fragmentation is the response of this whole to man's action, guided by illusory perception, which is shaped by fragmentary thought. In other words, it is just because reality is whole that man, with his fragmentary approach, will inevitably be answered with a correspondingly fragmentary response. So what is needed is for man to give attention to his habit of fragmentary thought, to be aware of it, and thus bring it to an end. Man's approach to reality may then be whole, and so the response will be whole.

For this to happen, however, it is crucial that man be aware of the activity of his thought *as such*; i.e. as a form of insight, a way of looking, rather than as a 'true copy of reality as it is'.

It is clear that we may have any number of different kinds of insights. What is called for is not an integration of thought, or a

kind of imposed unity, for any such imposed point of view would itself be merely another fragment. Rather, all our different ways of thinking are to be considered as different ways of looking at the one reality, each with some domain in which it is clear and adequate. One may indeed compare a theory to a particular view of some object. Each view gives only an appearance of the object in some aspect. The whole object is not perceived in any one view but, rather, it is grasped only implicitly as that single reality which is shown in all these views. When we deeply understand that our theories also work in this way, then we will not fall into the habit of seeing reality and acting toward it as if it were constituted of separately existent fragments corresponding to how it appears in our thought and in our imagination when we take our theories to be 'direct descriptions of reality as it is'.

Beyond a general awareness of the role of theories as indicated above, what is needed is to give special attention to those theories that contribute to the expression of our overall self-world views. For, to a considerable extent, it is in these world views that our general notions of the nature of reality and of the relationship between our thought and reality are implicitly or explicitly formed. In this respect, the general theories of physics play an important part, because they are regarded as dealing with the universal nature of the matter out of which all is constituted, and the space and time in terms of which all material movement is described.

Consider, for example, the atomic theory, which was first proposed by Democritus more than 2,000 years ago. In essence, this theory leads us to look at the world as constituted of atoms, moving in the void. The ever-changing forms and characteristics of large-scale objects are now seen as the results of changing arrangements of the moving atoms. Evidently, this view was, in certain ways, an important mode of realization of wholeness, for it enabled men to understand the enormous variety of the whole world in terms of the movements of one single set of basic

constituents, through a single void that permeates the whole of existence. Nevertheless, as the atomic theory developed, it ultimately became a major support for a fragmentary approach to reality. For it ceased to be regarded as an insight, a way of looking, and men regarded instead as an absolute truth the notion that the whole of reality is actually constituted of nothing but 'atomic building blocks', all working together more or less mechanically.

Of course, to take any physical theory as an absolute truth must tend to fix the general forms of thought in physics and thus to contribute to fragmentation. Beyond this, however, the particular content of the atomic theory was such as to be especially conducive to fragmentation, for it was implicit in this content that the entire world of nature, along with the human being, including his brain, his nervous system, his mind, etc., could in principle be understood completely in terms of structures and functions of aggregates of separately existent atoms. The fact that in man's experiments and general experience this atomic view was confirmed was, of course, then taken as proof of the correctness and indeed the universal truth of this notion. Thus almost the whole weight of science was put behind the fragmentary approach to reality.

It is important to point out, however, that (as usually happens in such cases) the experimental confirmation of the atomic point of view is limited. Indeed, in the domains covered by quantum theory and relativity, the notion of atomism leads to confused questions, which indicate the need for new forms of insight, as different from atomism as the latter is from theories that came before it.

Thus, the quantum theory shows that the attempt to describe and follow an atomic particle in precise detail has little meaning. (Further detail on this point is given in chapter 5.) The notion of an atomic path has only a limited domain of applicability. In a more detailed description the atom is, in many ways, seen to

behave as much like a wave as a particle. It can perhaps best be regarded as a poorly defined cloud, dependent for its particular form on the whole environment, including the observing instrument. Thus, one can no longer maintain the division between the observer and observed (which is implicit in the atomistic view that regards each of these as separate aggregates of atoms). Rather, both observer and observed are merging and interpenetrating aspects of one whole reality, which is indivisible and unanalysable.

Relativity leads us to a way of looking at the world that is similar to the above in certain key respects (see chapter 5 for more detail on this point). From the fact that in Einstein's point of view no signal faster than light is possible, it follows that the concept of a rigid body breaks down. But this concept is crucial in the classical atomic theory, for in this theory the ultimate constituents of the universe have to be small indivisible objects, and this is possible only if each part of such an object is bound rigidly to all other parts. What is needed in a relativistic theory is to give up altogether the notion that the world is constituted of basic objects or 'building blocks'. Rather, one has to view the world in terms of universal flux of events and processes. Thus, as indicated by A and B in figure 1.1, instead of thinking of a particle, one is to think of a 'world tube'.

This world tube represents an infinitely complex process of a structure in movement and development which is centred in a region indicated by the boundaries of the tube. However, even outside the tube, each 'particle' has a field that extends through space and merges with the fields of other particles.

A more vivid image of the sort of thing that is meant is afforded by considering wave forms as vortex structures in a flowing stream. As shown in figure 1.2, two vortices correspond to stable patterns of flow of the fluid, centred more or less at A and B. Evidently, the two vortices are to be considered as abstractions, made to stand out in our perception by our way of

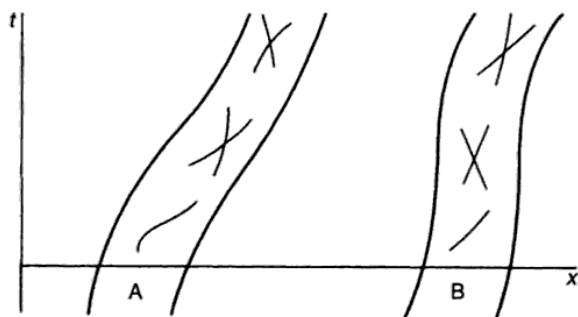


Figure 1.1

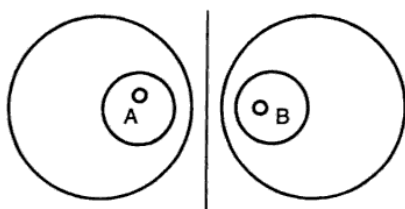


Figure 1.2

thinking. Actually, of course, the two abstracted flow patterns merge and unite, in one whole movement of the flowing stream. There is no sharp division between them, nor are they to be regarded as separately or independently existent entities.

Relativity theory calls for this sort of way of looking at the atomic particles, which constitute all matter, including of course human beings, with their brains, nervous systems, and the observing instruments that they have built and that they use in their laboratories. So, approaching the question in different ways, relativity and quantum theory agree, in that they both imply the need to look on the world as an *undivided whole*, in which all parts of the universe, including the observer and his instruments, merge and unite in one totality. In this totality, the



atomistic form of insight is a simplification and an abstraction, valid only in some limited context.

The new form of insight can perhaps best be called *Undivided Wholeness in Flowing Movement*. This view implies that flow is, in some sense, prior to that of the 'things' that can be seen to form and dissolve in this flow. One can perhaps illustrate what is meant here by considering the 'stream of consciousness'. This flux of awareness is not precisely definable, and yet it is evidently prior to the definable forms of thoughts and ideas which can be seen to form and dissolve in the flux, like ripples, waves and vortices in a flowing stream. As happens with such patterns of movement in a stream some thoughts recur and persist in a more or less stable way, while others are evanescent.

The proposal for a new general form of insight is that all matter is of this nature: That is, there is a universal flux that cannot be defined explicitly but which can be known only implicitly, as indicated by the explicitly definable forms and shapes, some stable and some unstable, that can be abstracted from the universal flux. In this flow, mind and matter are not separate substances. Rather, they are different aspects of one whole and unbroken movement. In this way, we are able to look on all aspects of existence as not divided from each other, and thus we can bring to an end the fragmentation implicit in the current attitude toward the atomic point of view, which leads us to divide everything from everything in a thoroughgoing way. Nevertheless, we can comprehend that aspect of atomism which still provides a correct and valid form of insight; i.e. that in spite of the undivided wholeness in flowing movement, the various patterns that can be abstracted from it have a certain relative autonomy and stability, which is indeed provided for by the universal law of the flowing movement. Now, however, we have the limits of this autonomy and stability sharply in mind.

Thus we can, in specified contexts, adopt other various forms of insight that enable us to simplify certain things and to treat

them momentarily and for certain limited purposes as if they were autonomous and stable, as well as perhaps separately existent. Yet we do not have to fall into the trap of looking at ourselves and at the whole world in this way. Thus our thought need no longer lead to the illusion that reality actually is of fragmentary nature, and to the corresponding fragmentary actions that arise out of perception clouded by such illusion.

The point of view discussed above is similar, in certain key ways, to that held by some of the Ancient Greeks. This similarity can be brought out by considering Aristotle's notion of causality. Aristotle distinguished four kinds of causes:

- Material
- Efficient
- Formal
- Final

A good example in terms of which this distinction can be understood is obtained by considering something living, such as a tree or an animal. The material cause is then just the matter in which all the other causes operate and out of which the thing is constituted. Thus, in the case of a plant, the material cause is the soil, air, water and sunlight, constituting the substance of the plant. The efficient cause is some action, external to the thing under discussion, which allows the whole process to get under way. In the case of a tree, for example, the planting of the seed could be taken as the efficient cause.

It is of crucial significance in this context to understand what was meant by formal cause. Unfortunately, in its modern connotation, the word 'formal' tends to refer to an outward form that is not very significant (e.g. as in 'formal dress' or 'a mere formality'). However, in the Ancient Greek philosophy, the word *form* meant, in the first instance, an inner forming activity which is the cause of the growth of things, and of the development and

differentiation of their various essential forms. For example, in the case of an oak tree, what is indicated by the term 'formal cause' is the whole inner movement of sap, cell growth, articulation of branches, leaves, etc., which is characteristic of that kind of tree and different from that taking place in other kinds of trees. In more modern language, it would be better to describe this as *formative cause*, to emphasize that what is involved is not a mere form imposed from without, but rather *an ordered and structured inner movement that is essential to what things are*.

Any such formative cause must evidently have an end or product which is at least implicit. Thus, it is not possible to refer to the inner movement from the acorn giving rise to an oak tree, without simultaneously referring to the oak tree that is going to result from this movement. So formative cause always implies final cause.

Of course, we also know final cause as *design*, consciously held in mind through thought (this notion being extended to God, who was regarded as having created the universe according to some grand design). Design is, however, only a special case of final cause. For example, men often aim toward certain ends in their thoughts but what actually emerges from their actions is generally something different from what was in their design, something that was, however, *implicit* in what they were doing, though not consciously perceived by those who took part.

In the ancient view, the notion of formative cause was considered to be of essentially the same nature for the mind as it was for life and for the cosmos as a whole. Indeed, Aristotle considered the universe as a single organism in which each part grows and develops in its relationship to the whole and in which it has its proper place and function. With regard to the mind, we can understand this sort of notion in more modern terms by turning our attention to the flowing movement of awareness. As indicated earlier, one can, in the first instance, discern various thought patterns in this flow. These follow on each other

relatively mechanically, through association determined by habit and conditioning. Evidently, such associative changes are external to the inner structure of the thoughts in question, so that these changes act like a series of efficient causes. However, to see the *reason* for something is not a mechanical activity of this nature: Rather, one is aware of each aspect as assimilated within a single whole, all of whose parts are inwardly related (as are, for example, the organs of the body). Here, one has to emphasize that the act of reason is essentially a kind of perception through the mind, similar in certain ways to artistic perception, and not merely the associative repetition of reasons that are already known. Thus, one may be puzzled by a wide range of factors, things that do not fit together, until suddenly there is a flash of understanding, and therefore one sees how all these factors are related as aspects of one totality (e.g. consider Newton's insight into universal gravitation). Such acts of perception cannot properly be given a detailed analysis or description. Rather, they are to be considered as aspects of the *forming* activity of the mind. A particular structure of concepts is then the *product* of this activity, and these products are what are linked by the series of efficient causes that operate in ordinary associative thinking – and as pointed out earlier, in this view, one regards the forming activity as primary in nature as it is in the mind, so that the product forms in nature are also what are linked by efficient causes.

Evidently, the notion of formative cause is relevant to the view of undivided wholeness in flowing movement, which has been seen to be implied in modern developments in physics, notably relativity theory and quantum theory. Thus, as has been pointed out, each relatively autonomous and stable structure (e.g., an atomic particle) is to be understood not as something independently and permanently existent but rather as a product that has been formed in the whole flowing movement and that will ultimately dissolve back into this movement. How it forms and maintains itself, then, depends on its place and function in the

whole. So, we see that certain developments in modern physics imply a sort of insight into nature that is in respect to the notions of formative and final cause, essentially similar to ways of looking that were common in earlier times.

Nevertheless, in most of the work that is being done in physics today the notions of formative and final cause are not regarded as having primary significance. Rather, law is still generally conceived as a self-determined system of efficient causes, operating in an ultimate set of material constituents of the universe (e.g. elementary particles subject to forces of interaction between them). These constituents are not regarded as formed in an overall process, and thus they are not considered to be anything like organs adapted to their place and function in the whole (i.e. to the ends which they would serve in this whole). Rather, they tend to be conceived as separately existent mechanical elements of a fixed nature.

The prevailing trend in modern physics is thus much against any sort of view giving primacy to formative activity in undivided wholeness of flowing movement. Indeed, those aspects of relativity theory and quantum theory which do suggest the need for such a view tend to be de-emphasized and in fact hardly noticed by most physicists, because they are regarded largely as features of the mathematical calculus and not as indications of the real nature of things. When it comes to the informal language and mode of thought in physics, which infuses the imagination and provokes the sense of what is real and substantial, most physicists still speak and think, with an utter conviction of truth, in terms of the traditional atomistic notion that the universe is constituted of elementary particles which are 'basic building blocks' out of which everything is made. In other sciences, such as biology, the strength of this conviction is even greater, because among workers in these fields there is little awareness of the revolutionary character of development in modern physics. For example, modern molecular biologists

generally believe that the whole of life and mind can ultimately be understood in more or less mechanical terms, through some kind of extension of the work that has been done on the structure and function of DNA molecules. A similar trend has already begun to dominate in psychology. Thus we arrive at the very odd result that in the study of life and mind, which are just the fields in which formative cause acting in undivided and unbroken flowing movement is most evident to experience and observation, there is now the strongest belief in the fragmentary atomistic approach to reality.

Of course, the prevailing tendency in science to think and perceive in terms of a fragmentary self-world view is part of a larger movement that has been developing over the ages and that pervades almost the whole of our society today: but, in turn, such a way of thinking and looking in scientific research tends very strongly to re-enforce the general fragmentary approach because it gives men a picture of the whole world as constituted of nothing but an aggregate of separately existent 'atomic building blocks', and provides experimental evidence from which is drawn the conclusion that this view is necessary and inevitable. In this way, people are led to feel that fragmentation is nothing but an expression of 'the way everything really is' and that anything else is impossible. So there is very little disposition to look for evidence to the contrary. Indeed, as has already been pointed out, even when such evidence does arise, as in modern physics, the general tendency is to minimize its significance or even to ignore it altogether. One might in fact go so far as to say that in the present state of society, and in the present general mode of teaching science, which is a manifestation of this state of society, a kind of prejudice in favour of a fragmentary self-world view is fostered and transmitted (to some extent explicitly and consciously but mainly in an implicit and unconscious manner).

As has been indicated, however, men who are guided by such

a fragmentary self-world view cannot, in the long run, do other than to try in their actions to break themselves and the world into pieces, corresponding to their general mode of thinking. Since, in the first instance, fragmentation is an attempt to extend the analysis of the world into separate parts beyond the domain in which to do this is appropriate, it is in effect an attempt to divide what is really indivisible. In the next step such an attempt will lead us also to try to unite what is not really unitable. This can be seen especially clearly in terms of groupings of people in society (political, economic, religious, etc.). The very act of forming such a group tends to create a sense of division and separation of the members from the rest of the world but, because the members are really connected with the whole, this cannot work. Each member has in fact a somewhat different connection, and sooner or later this shows itself as a difference between him and other members of the group. Whenever men divide themselves from the whole of society and attempt to unite by identification within a group, it is clear that the group must eventually develop internal strife, which leads to a breakdown of its unity. Likewise when men try to separate some aspect of nature in their practical, technical work, a similar state of contradiction and disunity will develop. The same sort of thing will happen to the individual when he tries to separate himself from society. True unity in the individual and between man and nature, as well as between man and man, can arise only in a form of action that does not attempt to fragment the whole of reality.

Our fragmentary way of thinking, looking, and acting, evidently has implications in every aspect of human life. That is to say, by a rather interesting sort of irony, fragmentation seems to be the one thing in our way of life which is universal, which works through the whole without boundary or limit. This comes about because the roots of fragmentation are very deep and pervasive. As pointed out, we try to divide what is one and

indivisible, and this implies that in the next step we will try to identify what is different.

So fragmentation is in essence a confusion around the question of difference and sameness (or one-ness), but the clear perception of these categories is necessary in every phase of life. *To be confused about what is different and what is not, is to be confused about everything.* Thus, it is not an accident that our fragmentary form of thought is leading to such a widespread range of crises, social, political, economic, ecological, psychological, etc., in the individual and in society as a whole. Such a mode of thought implies unending development of chaotic and meaningless conflict, in which the energies of all tend to be lost by movements that are antagonistic or else at cross-purposes.

Evidently, it is important and indeed extremely urgent to clear up this deep and pervasive kind of confusion that penetrates the whole of our lives. What is the use of attempts at social, political, economic or other action if the mind is caught up in a confused movement in which it is generally differentiating what is not different and identifying what is not identical? Such action will be at best ineffective and at worst really destructive.

Nor will it be useful to try to impose some fixed kind of integrating or unifying 'holistic' principle on our self-world view, for, as indicated earlier, any form of fixed self-world view implies that we are no longer treating our theories as insights or ways of looking but, rather, as 'absolutely true knowledge of things as they really are'. So, whether we like it or not, the distinctions that are inevitably present in every theory, even an 'holistic' one, will be falsely treated as divisions, implying separate existence of the terms that are distinguished (so that, correspondingly, what is not distinguished in this way will be falsely treated as absolutely identical).

We have thus to be alert to give careful attention and serious consideration to the fact that our theories are not 'descriptions of reality as it is' but, rather, ever-changing forms of insight,



which can point to or indicate a reality that is implicit and not describable or specifiable in its totality. This need for being thus watchful holds even for what is being said here in this chapter, in the sense that this is not to be regarded as 'absolutely true knowledge of the nature of fragmentations and wholeness'. Rather, it too is a theory that gives insight into this question. It is up to the reader to see for himself whether the insight is clear or unclear and what are the limits of its validity.

What, then, can be done to end the prevailing state of fragmentation? At first sight this may seem to be a reasonable question but a closer examination leads one to ask whether it is in fact a reasonable question, for one can see that this question has presuppositions that are not clear.

Generally speaking, if one asks how one can solve some technical problem, for example, it is presupposed that while we begin not knowing the answer, our minds are nevertheless clear enough to discover an answer, or at least to recognize someone else's discovery of an answer. But if our whole way of thinking is penetrated by fragmentation, this implies that we are not capable of this, for fragmentary perception is in essence a largely unconscious habit of confusion around the question of what is different and what is not. So, in the very act in which we try to discover what to do about fragmentation, we will go on with this habit and thus we will tend to introduce yet further forms of fragmentation.

This does not necessarily mean, of course, that there is no way out at all, but it does mean that we have to give pause so that we do not go with our habitual fragmentary ways of thinking as we seek solutions that are ready to hand. The question of fragmentation and wholeness is a subtle and difficult one, more subtle and difficult than those which lead to fundamentally new discoveries in science. To ask how to end fragmentation and to expect an answer in a few minutes makes even less sense than to ask how to develop a theory as new as Einstein's was when he was working

on it, and to expect to be told what to do in terms of some programme, expressed in terms of formulae or recipes.

One of the most difficult and subtle points about this question is just to clarify what is to be meant by the relationship between the content of thought and the process of thinking which produces this content. A major source of fragmentation is indeed the generally accepted presupposition that the process of thought is sufficiently separate from and independent of its content, to allow us generally to carry out clear, orderly, rational thinking, which can properly judge this content as correct or incorrect, rational or irrational, fragmentary or whole, etc. Actually, as has been seen, the fragmentation involved in a self-world view is not only in the content of thought, but in the general activity of the person who is 'doing the thinking', and thus, it is as much in the process of thinking as it is in the content. Indeed, content and process are not two separately existent things, but, rather, they are two aspects of views of one whole movement. Thus fragmentary content and fragmentary process have to come to an end *together*.

What we have to deal with here is a one-ness of the thinking process and its content, similar in key ways to the one-ness of observer and observed; that has been discussed in connection with relativity theory and quantum theory. Questions of this nature cannot be met properly while we are caught up, consciously or unconsciously, in a mode of thought which attempts to analyse itself in terms of a presumed separation between the process of thinking and the content of thought that is its product. By accepting such a presumption we are led, in the next step, to seek some fantasy of action through efficient causes that would end the fragmentation in the content while leaving the fragmentation in the actual process of thinking untouched. What is needed, however, is somehow to grasp the overall formative cause of fragmentation, in which content and actual process are seen together, in their wholeness.

One might here consider the image of a turbulent mass of vortices in a stream. The structure and distribution of vortices, which constitute a sort of content of the description of the movement, are not separate from the formative activity of the flowing stream, which creates, maintains, and ultimately dissolves the totality of vortex structures. So to try to eliminate the vortices without changing the formative activity of the stream would evidently be absurd. Once our perception is guided by the proper insight into the significance of the whole movement, we will evidently not be disposed to try such a futile approach. Rather, we will look at the whole situation, and be attentive and alert to learn about it, and thus to discover what is really an appropriate sort of action, relevant to this whole, for bringing the turbulent structure of vortices to an end. Similarly, when we really grasp the truth of the one-ness of the thinking process that we are actually carrying out, and the content of thought that is the product of this process, then such insight will enable us to observe, to look, to learn about the whole movement of thought and thus to discover an action relevant to this whole, that will end the 'turbulence' of movement which is the essence of fragmentation in every phase of life.

Of course, such learning and discovery will require a great deal of careful attention and hard work. We are ready to give such attention and work in a wide range of fields, scientific, economic, social, political, etc. As yet, however, little or none of this has gone into the creation of insight into the process of thought, on the clarity of which the value of all else depends. What is primarily needed is a growing realization of the extremely great danger of going on with a fragmentary process of thought. Such a realization would give the inquiry into how thought actually operates that sense of urgency and energy required to meet the true magnitude of the difficulties with which fragmentation is now confronting us.

## APPENDIX: RÉSUMÉ OF DISCUSSION ON WESTERN AND EASTERN FORMS OF INSIGHT INTO WHOLENESS

In the very early phases of the development of civilization, man's views were essentially of wholeness rather than of fragmentation. In the East (especially in India) such views still survive, in the sense that philosophy and religion emphasize wholeness and imply the futility of analysis of the world into parts. Why, then, do we not drop our fragmentary Western approach and adopt these Eastern notions which include not only a self-world view that denies division and fragmentation but also techniques of meditation that lead the whole process of mental operation non-verbally to the sort of quiet state of orderly and smooth flow needed to end fragmentation both in the actual process of thought and in its content?

To answer such a question, it is useful to begin by going into the difference between Western and Eastern notions of measure. Now, in the West the notion of measure has, from very early times, played a key role in determining the general self-world view and the way of life implicit in such a view. Thus among the Ancient Greeks, from whom we derive a large part of our fundamental notions (by way of the Romans), to keep everything in its right measure was regarded as one of the essentials of a good life (e.g. Greek tragedies generally portrayed man's suffering as a consequence of his going beyond the proper measure of things). In this regard, measure was not looked on in its modern sense as being primarily some sort of comparison of an object with an external standard or unit. Rather, this latter procedure was regarded as a kind of outward display or appearance of a deeper 'inner measure', which played an essential role in everything. When something went beyond its proper measure, this meant not merely that it was not conforming to some external standard of what was right but, much more, that it was inwardly out of

harmony, so that it was bound to lose its integrity and break up into fragments. One can obtain some insight into this way of thinking by considering the earlier meanings of certain words. Thus, the Latin 'mederi' meaning 'to cure' (the root of the modern 'medicine') is based on a root meaning 'to measure'. This reflects the view that physical health is to be regarded as the outcome of a state of right inward measure in all parts and processes of the body. Similarly, the word 'moderation', which describes one of the prime ancient notions of virtue, is based on the same root, and this shows that such virtue was regarded as the outcome of a right inner measure underlying man's social actions and behaviour. Again, the word 'meditation', which is based on the same root, implies a kind of weighing, pondering, or measuring of the whole process of thought, which could bring the inner activities of the mind to a state of harmonious measure. So, physically, socially and mentally, awareness of the inner measure of things was seen as the essential key to a healthy, happy, harmonious life.

It is clear that measure is to be expressed in more detail through proportion or ratio; and 'ratio' is the Latin word from which our modern 'reason' is derived. In the ancient view, reason is seen as insight into a totality of ratio or proportion, regarded as relevant inwardly to the very nature of things (and not only outwardly as a form of comparison with a standard or unit). Of course, this ratio is not necessarily merely a numerical proportion (though it does, of course, include such proportion). Rather, it is in general a qualitative sort of universal proportion or relationship. Thus, when Newton perceived the insight of universal gravitation, what he saw could be put in this way: 'As the apple falls, so does the moon, and so indeed does everything.' To exhibit the form of the ratio yet more explicitly, one can write:

$$A : B :: C : D :: E : F$$

where A and B represent successive positions of the apple at successive moments of time, C and D those of the moon, and E and F those of any other object.

Whenever we find a theoretical reason for something, we are exemplifying this notion of ratio, in the sense of implying that as the various aspects are related in our idea, so they are related in the thing that the idea is about. The essential reason or ratio of a thing is then the totality of inner proportions in its structure, and in the process in which it forms, maintains itself, and ultimately dissolves. In this view, to understand such ratio is to understand the 'innermost being' of that thing.

It is thus implied that measure is a form of insight into the essence of everything, and that man's perception, following on ways indicated by such insight, will be clear and will thus bring about generally orderly action and harmonious living. In this connection, it is useful to call to mind Ancient Greek notions of measure in music and in the visual arts. These notions emphasized that a grasp of measure was a key to the understanding of harmony in music (e.g., measure as rhythm, right proportion in intensity of sound, right proportion in tonality, etc.). Likewise, in the visual arts, right measure was seen as essential to overall harmony and beauty (e.g., consider the 'Golden Mean'). All of this indicates how far the notion of measure went beyond that of comparison with an external standard, to point to a universal sort of inner ratio or proportion, perceived both through the senses and through the mind.

Of course, as time went on, this notion of measure gradually began to change, to lose its subtlety and to become relatively gross and mechanical. Probably this was because man's notion of measure became more and more routinized and habitual, both with regard to its outward display in measurements relative to an external unit and to its inner significance as universal ratio relevant to physical health, social order, and mental harmony. Men began to learn such notions of measure mechanically, by

conforming to the teachings of their elders or their masters, and not creatively through an inner feeling and understanding of the deeper meaning of the ratio or proportion which they were learning. So measure gradually came to be taught as a sort of rule that was to be imposed from outside on the human being, who in turn imposed the corresponding measure physically, socially and mentally, in every context in which he was working. As a result, the prevailing notions of measure were no longer seen as forms of insight. Rather, they appeared to be 'absolute truths about reality as it is', which men seemed always to have known, and whose origin was often explained mythologically as binding injunctions of the Gods, which it would be both dangerous and wicked to question. Thought about measure thus tended to fall mainly into the domain of unconscious habit and, as a result, the forms induced in perception by this thought were now seen as directly observed objective realities, which were essentially independent of how they were thought about.

Even by the time of the Ancient Greeks, this process had gone a long way and, as men realized this, they began to question the notion of measure. Thus Protagoras said: 'Man is the measure of all things', thus emphasizing that measure is not a reality external to man, existing independently of him. But many who were in the habit of looking at everything externally also applied this way of looking to what Protagoras said. Thus, they concluded that measure was something arbitrary, and subject to the capricious choice or taste of each individual. In this way they of course overlooked the fact that measure is a form of insight that has to fit the overall reality in which man lives, as demonstrated by the clarity of perception and harmony of action to which it leads. Such insight can arise properly only when a man works with seriousness and honesty, putting truth and factuality first, rather than his own whims or desires.

The general rigidification and objectification of the notion of measure continued to develop until, in modern times, the very

word 'measure' has come to denote mainly a process of comparison of something with an external standard. While the original meaning still survives in some contexts (e.g., art and mathematics) it is generally felt as having only a secondary sort of significance.

Now, in the East the notion of measure has not played nearly so fundamental a role. Rather, in the prevailing philosophy in the Orient, the immeasurable (i.e. that which cannot be named, described, or understood through any form of reason) is regarded as the primary reality. Thus, in Sanskrit (which has an origin common to the Indo-European language group) there is a word 'matra' meaning 'measure', in the musical sense, which is evidently close to the Greek 'metron'. But then there is another word 'maya' obtained from the same root, which means 'illusion'. This is an extraordinarily significant point. Whereas to Western society, as it derives from the Greeks, measure, with all that this word implies, is the very essence of reality, or at least the key to this essence, in the East measure has now come to be regarded commonly as being in some way false and deceitful. In this view the entire structure and order of forms, proportions, and 'ratios' that present themselves to ordinary perception and reason are regarded as a sort of veil, covering the true reality, which cannot be perceived by the senses and of which nothing can be said or thought.

It is clear that the different ways the two societies have developed fit in with their different attitudes to measure. Thus, in the West, society has mainly emphasized the development of science and technology (dependent on measure) while in the East, the main emphasis has gone to religion and philosophy (which are directed ultimately toward the immeasurable).

If one considers this question carefully, one can see that in a certain sense the East was right to see the immeasurable as the primary reality. For, as has already been indicated, measure is an insight created by man. A reality that is beyond man and prior to



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