

THE SHIFT TO AN ANTHROPOMORPHIC MODEL OF MAN

Thanks to the work of Kuhn, it is now possible to express radical movements in scientific thought in a general context. Deep changes in the sciences of man have been taking place. There has been what Kuhn calls a paradigm-shift: I will try to bring it into focus in this short paper. The notion of paradigm was introduced by Kuhn in an attempt to make clear the intellectual and social structure of scientific revolutions. By a paradigm he can be interpreted to mean that complex of metaphysics, general theory of action and methodology which forms a coherent background to the science of a particular time, and which is often given concrete expression in some admired archetype of scientific work, such as Newton's Principia. I believe that the present state of the sciences of man as a social being is explicable as a transition from one paradigm to another, from what I shall call 'The Old Paradigm', to 'The New'. I shall try to articulate some features of the New Paradigm.

I have chosen to centre my exposition in this paper around social psychology. It is particularly in that field that conceptions of method and ideas about the nature of human beings and their modes of action come into the sharpest focus. But whenever a New Paradigm appears in a central area of a scientific field its effect is felt wherever a similar subject matter is studied, and so a New Paradigm in social psychology must have an effect in anthropology, encouraging some existing trends and inhibiting others.

The Old Paradigm involves the conception of scientific theory as a deductive structure from which the empirically ascertained laws are to be derived by strict logical inference. It conceives of the function of theory as confined to the bringing of order into the empirically ascertained laws. This positivistic view of theories has the important consequence that provided the theory performs well logically one may be fairly casual about the verisimilitude of its terms. Indeed in psychology generally positivistic ways have encouraged a kind of 'experimentalism', by which it is hoped that experimentation by itself will create an appropriate system of concepts.

In the Old Paradigm a law has the form $F(x,y)$ where x and y are dependent and independent variables, and it is assumed that all properties of the system in which this 'law' is observed to hold can be treated as parameters, that is maintained constant without materially affecting the relationship between those allowed to vary. This assumption is thought to be justified in its turn by the general principle that the aim of science is to discover correlations between changes in the properties of systems. In the farthest background lies Hume's theory of causality according to which such correlations are causal laws. The Old Paradigm has been very clearly articulated for psychology by C.L.Hull, and is particularly well exemplified in social psychological contexts by the work of 'experimentalists' such as J.W.Brehm.

It is very important to realize that this paradigm was not derived by abstraction from real scientific work, but was an invention of philosophers. In modern times it has its origin in Berkeley's attempt to establish the existence of God and other spirits by denying that matter had causal powers and by insisting that science was really no more than a set of rules for anticipating sense experience. This idea was taken up by Hume and developed by John Stuart Mill, from whom it was adopted as a methodology by the infant social sciences. There is a measure of irony in the strict adherence by social scientists to a methodology which they hoped would give them scientific respectability, when that methodology derives from such an ancestry!

The New Paradigm derives from a double paradigm shift. The First Shift involves passing from a philosopher's conception of how science ought to be, to the use of methods which are actually employed in the advanced sciences. The most important aspect of this paradigm shift for the social sciences is in the understanding of the role of theory. In the New Paradigm theory describes models of the real processes which generate behaviour, and so must be taken with the utmost seriousness. And in the modern physical sciences theory is built around the idea that the explanations of the way things and materials behave is to be explained by certain powers, which they have in virtue of their natures. In chemistry this is the familiar idea of valency, which is the combining power of an atom which it has in virtue of its electron structure. In psycholinguistics this is the Chomskian idea of a competence, which is one of the linguistic powers a person has in virtue of the structure of his brain and nervous system. In the New Paradigm for social science the most important human power is that of monitoring the way one controls one's performance. But more of this in a moment.

The Second Shift concerns the nature of the entities that are being studied and their mode of action. In the Old Paradigm people were conceived as complex but essentially mechanistic devices, whose behaviour could be analyzed into simple stimulus-response regularities. In so far as a person is aware of his behaviour this is scarcely more than as a spectator of the flow of responses to controlling variables. But this is a caricature. It is clear that social life, at least, is mediated by the grasping and exchanging of meanings, and is profoundly affected by the flux of emotions, the state of people's knowledge, their beliefs, and so on. Apparently paradoxically the ordinary notion of a person is a much more complex and realistic concept than is the truncated mechanism of the Old Paradigm. Why then should any intelligent person subscribe to the Old Paradigm? The answer is that people thought that any reference to mental states or meanings was subjective, and unscientific. In the New Paradigm a conceptual system is being articulated which by following the actual method of the physical sciences more closely, encourages the introduction of just those very elements of feeling and meaning which were eliminated by adherence to the Old Paradigm idea of science. If one wants to get an idea of what New Paradigm social science looks like there are the works of Erving Goffman to be studied. He seems to have realized all this for himself, and long before there was any general movement in that direction. His work is not the less scientific because it does not resemble mathematical physics. It is the more scientific precisely because it uses a methodology and a conceptual system appropriate to the material of study, that is, the way people carry on their social lives.

Conceiving of human beings as people and their mode of action, as social beings to be self-monitored rule-following, means that very different models of the processes which generate social behaviour must be used from those of the old paradigm. One important feature of such models will be that they must contain some form of 'feedback', by which the various orders of monitoring of performance can be achieved. This is not the simple sort of feedback that is found in thermostats, but more the sort of arrangements that are found in automatic pilots in aircraft. The system contains a model of itself and of its environment, and it matches its performance against the behaviour of that model. In the New Paradigm specifically human functioning is thought to be explicable by supposing that a person contains a model of the lower order model, and that it controls such higher order features as the style of its performance with this complex device. The mathematics of the New Paradigm will then be System Theory, and statistics will be used as in the advanced sciences, not as an exploratory tool, but as part of the theory of error. The general form of such psychomathematics can be found in the introduction of Bayliss's book Living Control Systems. This Second Shift takes us into what I call the Anthropomorphic model of Man.

The form of the mathematics and the nature of the theories so expressed are closely connected. Information theory and statistical forms of the parametric method are the mathematics of the Old Paradigm since it is concerned with correlational relations between 'behaviours' and their conditions, and in the spirit of the positivist conception of science is quite casual about their connection. Information theory concepts describing the channels themselves are logical functions of the concepts describing input and output, so that realistic hypotheses as to the neural mechanisms cannot be generated from within that theory. It follows from the considerations I have been advancing that Systems Theory, the mathematics of the New Paradigm enables us

(a) to express the control of performance by monitoring, and so given the relation between neurophysiology and performance,

(b) to generate realistic hypotheses as to the structure of the entity which is capable of the performances we have identified as essential to social life, and Chomsky has identified as essential to using language, that is as to the physiological basis of competences and powers.

The essential structure of the anthropomorphic model from a scientific point of view, can be viewed most easily in the rather narrow context of individual psychology, but has direct consequences for anthropology.

In each human being there is a complex pattern of sequential physiological states, which for illustrative purposes can be supposed to be decomposable into linear sequences. Let such a sequence be

$$P_1 - P_2 - P_3 - \dots - P_n.$$

Applying the realist scientific method to the understanding of this sequence leads to the postulation of physiological mechanisms $M_1 - M_k$ which produce the sequential pattern. These elements of the pattern which we related through the operation of one or more of these mechanisms can be called 'cause and effect'.

We also know that in each human being there is also a complex pattern of sequential psychic states, such as emotions and thoughts of various kinds. For illustrative purposes let us suppose part of this sequence to be represented by

$$S_1 - S_2 - S_3 - \dots - S_m.$$

What do we know about

- (i) the relation of this sequence to the physiological sequence?
- (ii) the generation of the sequence?

We know from a number of studies, the most important of which are those by Schachter, that the correct way of considering the S-sequence with respect to the P-sequence, is that the S-sequence consists of the meanings given by the person who experiences that sequence to some of the items of the P-sequence. For example P_1 may not be experienced as a meaningful psychic state, but P_2, P_3 and P_4 may be experienced jointly in S_1 , P_6 as S_2 , and P_5 as S_3 .

In fact the sequences may be ordered very differently and correspond very unevenly.

Since the S-sequence is a sequence of meanings the organization imposed on that sequence will have something of the character of a grammar, and will involve relations which could hold between meanings. The most characteristic of such order-giving relations is 'reason for'. Since the P-sequence is a sequence of physico-chemical states organization will be imposed upon it by such concepts as 'oxidation of....'. This explains why the organization of the sequences are, in general, a bad fit.

Applying the realist methodology of reason to the S-pattern demands the introduction of generating 'mechanisms' for that pattern appropriate to its nature. Typically those will be transformations of deep structures, and other suitable mechanisms, or in some cases, where the mechanisms elude detection, models of the unknown generators. It is here that Freudian concepts might have a place in a scientific psychology.

As to the metaphysics behind the two sequences of states, I accept the contingent identity thesis, or 'Australian materialism', that the differences between S-states and P-states are not differences in existence, that is they are not numerically distinct, but are differences in the mode of manifestation of the one existent. S-states and P-states differ pretty much as do statements and the marks or sounds of which they are the meaning. Detailed applications of this idea to psychology have been worked out.

The P-sequence is susceptible of a preliminary application of the parametric method, and the use of independent and dependent variables as analytical tools, but this is justified only because of the nature of the mechanisms which generate the pattern and sequence of P-states. The S-sequence is not susceptible of the application of this method, in general, because generative 'grammars' and their analogues produce patterns in such a way that those patterns are not susceptible to this method of analysis; of Chomsky, particularly Syntactic Structures.

S-sequences are 'teleological' in the weak, Taylor sense, in that they are ordered by such concepts as 'reason for' and 'intention' and 'following a rule', while P-sequences are non-teleological, in that they are organized by the concept 'physical cause of...'. S- and P-sequences are not, in general, mutually convertible, because of the degree of mismatch of their respective organization.

The structure of the S-system determines the structure which is sought in the P-system when we are seeking an explanation of the S-system. Since it is a logical point that the criteria of identity for entities and systems on the P side must derive from the S side, in order to be relevant to the explanation of performance, psychology must necessarily impose its form upon physiological investigations. If the S-sequence is not only grammatically ordered, but is also seen to involve modelling and monitoring feedback, then it will impose a system-theoretical structure upon physiological hypotheses, since the neurological system must contain the necessary mechanisms for the performance of the higher order functions. And in so far as we inherit those mechanisms there will be deep structures in grammar and in the rules of social life. We have seen preliminary steps in the discovery of these structures for language by Chomsky and for certain aspects of the social behaviour of men by Lévi-Strauss. If the society of men is essentially a linguistic phenomenon, then there should be 'social universals', and Lévi-Strauss has opened up one way of seeking for them. But it remains an empirical question whether there is an underlying deep structure to meanings, and this would still be an empirical question even if the Chomskian grammatical thesis for languages was finally established.

Ron Harré.

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