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Source: *The British Journal of Sociology*, Vol. 7, No. 3 (Sep., 1956), pp. 226-252

Published by: Wiley on behalf of The London School of Economics and Political Science

Stable URL: <http://www.jstor.org/stable/587994>

Accessed: 31-05-2015 18:34 UTC

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Problems of Involvement and Detachment

NORBERT ELIAS

Old Lady : Are you not prejudiced ?

Author : Madame, rarely will you meet a more prejudiced man nor one who tells himself he keeps his mind more open. But cannot that be because one part of our mind, that which we act with, becomes prejudiced through experience, and still we keep another part completely open to observe and judge with ?

Old Lady : Sir, I do not know.

Author : Madame, neither do I and it may well be that we are talking nonsense.

Old Lady : That is an odd term and one I did not encounter in my youth.

Author : Madame, we apply the term now to describe unsoundness in abstract conversation, or, indeed, any overmetaphysical tendency in speech.

Old Lady : I must learn to use these terms correctly.

E. Hemingway, *Death in the afternoon*.

I

ONE cannot say of a man's outlook in any absolute sense that it is detached or involved (or, if one prefers, "rational" or "irrational", "objective" or "subjective"). Only small babies, and among adults perhaps only insane people, become involved in whatever they experience with complete abandon to their feelings here and now ; and again only the insane can remain totally unmoved by what goes on around them. Normally adult behaviour lies on a scale somewhere between these two extremes. In some groups, and in some individuals of these groups, it may come nearer to one of them than in others ; it may shift hither and thither as social and mental pressures rise and fall. But social life as we know it would come to an end if standards of adult behaviour went too far in either direction. As far as one can see, the very existence of ordered group life depends on the interplay in men's thoughts and actions of impulses in both directions, those that involve and those that detach keeping each other in check. They may clash and struggle for dominance or compromise and form alloys of many different shades and kinds—however varied, it is the relation between the two which sets people's course. In using these terms,¹ one refers in short to

¹ It is still the prevalent practice to speak of psychological characteristics and of social characteristics of people not only as different, but as separable and in the last resort independent

changing equilibria between sets of mental activities which in man's relations with men, with non-human objects and with himself (whatever their other functions may be) have the function to involve and to detach.

As tools of thinking, therefore, "involvement" and "detachment" would remain highly ineffectual if they were understood to adumbrate a sharp division between two independent sets of phenomena. They do not refer to two separate classes of objects; used as universals they are, at best, marginal concepts. In the main, what we observe are people and people's manifestations, such as patterns of speech or of thought, and of other activities, some of which bear the stamp of higher, others of lesser detachment or involvement. It is the continuum that lies between these marginal poles that presents the principal problem. Can one determine with greater accuracy the position of specific attitudes or products of men within this continuum? One might, impressionistically, say for example that in societies like ours people tend to be more detached in their approaches to natural than to social events. Can one trace, at least summarily, criteria for different degrees of detachment and involvement? What in fact is meant, what does it imply if one says that in societies such as ours with a relatively high degree of industrialization and of control over non-human forces of nature, approaches to nature are on the whole more detached than those to society? The degree of detachment shown by different individuals in similar situations may differ greatly. Can one, nevertheless, speak, in this respect, of different degrees of detachment and involvement regardless of these individual variations?

II

The way in which individual members of a group experience whatever affects their senses, the meaning which it has for them, depends on the standard forms of dealing with, and of thinking and speaking about, these phenomena gradually evolved in their society. Thus, although the degree of detachment

sets of properties. And if this is the assumption underlying one's form of discourse, terms like "involved" and "detached", as they are used here, must appear as equivocal and vague. They have been chosen in preference to other perhaps more familiar terms precisely because they do not fall in line with linguistic usages which are based on the tacit assumption of the ultimate independence of psychological and social properties of men. They do not suggest as some current scientific concepts do that there are two separate sets of human functions or attributes, one psychological and one social in character, which communicate with each other only occasionally during a limited span of time with a definite beginning and a definite end by means of those one-way connections which we call "causes-and-effects" and then withdraw from each other until a new causal connection is established again with a definite beginning and a definite end.

Both these terms express quite clearly that changes in a person's relation with others and psychological changes are distinct but inseparable phenomena. The same holds good of their use as expressions referring to men's relation to "objects" in general. They seem preferable to others which like "subjective" and "objective" suggest a static and unbridgeable divide between two entities "subject" and "object". To give a brief and all too simple example of their meaning in this context: A philosopher once said, "If Paul speaks of Peter he tells us more about Paul than about Peter." One can say, by way of comment, that in speaking of Peter he is always telling us something about himself as well as about Peter. One would call his approach "involved" as long as his own characteristics, the characteristics of the perceiver, overshadow those of the perceived. If Paul's propositions begin to tell more about Peter than about himself the balance begins to turn in favour of detachment.

shown in one's encounter with natural forces may vary from individual to individual and from situation to situation, the concepts themselves which, in societies like ours, all individuals use in thinking, speaking and acting, concepts like "lightning", "tree" or "wolf" not less than "electricity", "organism", "cause-and-effect" or "nature", in the sense in which they are used to-day, represent a relatively high degree of detachment; so does the socially induced experience of nature as a "landscape" or as "beautiful". The range of individual variations in detachment, in other words, is limited by the public standards of detachment embodied in modes of thinking and speaking about nature and in the widely institutionalized use of natural forces for human ends. Compared with previous ages control of emotions in experiencing nature, as that of nature itself, has grown. Involvement has lessened, but it has not disappeared. Even scientific approaches to nature do not require the extinction of other more involved and emotive forms of approach. What distinguishes these from other less detached approaches is the manner in which tendencies towards detachment and towards involvement balance each other and blend.

Like other people, scientists engaged in the study of nature are, to some extent, prompted in the pursuit of their task by personal wishes and wants; they are often enough influenced by specific needs of the community to which they belong. They may wish to foster their own career. They may hope that the results of their inquiries will be in line with theories they have enunciated before or with the requirements and ideals of groups with which they identify themselves. But these involvements, in the natural sciences, determine as a rule nothing more than the general direction of inquiries; they are, in most cases, counter-balanced and checked by institutionalized procedures which compel scientists, more or less, to detach themselves, for the time being, from the urgent issues at hand. The immediate problems, personal or communal, induce problems of a different kind, scientific problems which are no longer directly related to specific persons or groups. The former, more narrowly time-bound, often serve merely as a motive force; the latter, the scientific problems which they may have induced, owe their form and their meaning to the wider and less time-bound continuum of theories and observations evolved in this or that problem-area by generations of specialists.

Like other human activities scientific inquiries into nature embody sets of values. To say that natural sciences are "non-evaluating" or "value-free" is a misuse of terms. But the sets of values, the types of evaluations which play a part in scientific inquiries of this type differ from those which have as their frame of reference the interests, the well-being or suffering of oneself or of social units to which one belongs. The aim of these inquiries is to find the inherent order of events as it is, independently not of any, but of any particular observer, and the importance, the relevance, the value of what one observes is assessed in accordance with the place and function it appears to have within this order itself.

In the exploration of nature, in short, scientists have learned that any

direct encroachment upon their work by short-term interests or needs of specific persons or groups is liable to jeopardize the usefulness which their work may have in the end for themselves or for their own group. The problems which they formulate and, by means of their theories, try to solve, have in relation to personal or social problems of the day a high degree of autonomy; so have the sets of values which they use; their work is not "value-free", but it is, in contrast to that of many social scientists, protected by firmly established professional standards and other institutional safeguards against the intrusion of heteronomous evaluations.¹ Here, the primary tendency of man to take the short route from a strongly felt need to a precept for its satisfaction has become more or less subordinate to precepts and procedures which require a longer route. Natural scientists seek to find ways of satisfying human needs by means of a detour—the detour via detachment. They set out to find solutions for problems potentially relevant for all human beings and all human groups. The question characteristic of men's involvement: "What does it mean for me or for us?" has become subordinate to questions like "What is it?" or "How are these events connected with others?" In this form, the level of detachment represented by the scientist's work has become more or less institutionalized as part of a scientific tradition reproduced by means of a highly specialized training, maintained by various forms of social control and socially induced emotional restraints; it has become embodied in the conceptual tools, the basic assumptions, the methods of speaking and thinking which scientists use.

Moreover, concepts and methods of this type have spread, and are spreading again and again, from the workshops of the specialists to the general public. In most industrial societies, impersonal types of explanations of natural events and other concepts based on the idea of a relatively autonomous order, of a course of events independent of any specific group of human observers, are used by people almost as a matter of course though most of them are probably unaware of the long struggle involved in the elaboration and diffusion of these forms of thinking.

Yet, here too, in society at large, these more detached forms of thinking represent only one layer in people's approaches to nature. Other more involved and emotive forms of thinking about nature have by no means disappeared.

¹ This concept has been introduced here in preference to the distinction between scientific procedures which are "value-free" and others which are not. It rather confuses the issue if the term "value", in its application to sciences, is reserved to those "values" which intrude upon scientific theories and procedures, as it were, from outside. Not only has this narrow use of the word led to the odd conclusion that it is possible to sever the connection between the activity of "evaluating" and the "values" which serve as its guide, it has also tended to limit the use of terms like "value" or "evaluating" in such a way that they seem applicable only in cases of what is otherwise known as "bias" or "prejudice". Yet, even the aim of finding out the relatedness of data, their inherent order or, as it is sometimes expressed, at approximating to the "truth", implies that one regards the discovery of this relatedness or of the "truth" as a "value". In that sense, every scientific endeavour has moral implications. Instead of distinguishing between two types of sciences, one of which is "value-free" while the other is not, one may find it both simpler and more apposite to distinguish in scientific pronouncements between two types of evaluations, one autonomous, the other heteronomous, of which one or the other may be dominant.

Thus in falling ill one may find one's thoughts stray again and again to the question: "Who is to blame for this?" The childhood experience of pain as the outcome of an attack and perhaps a certain urge to retaliate may assert themselves even though under the pressure of an overgrown conscience the attack may appear as deserved, so that one may come to feel, rightly or wrongly, one has only oneself to blame for it. And yet one may accept at the same time the doctor's more detached dictum that this illness followed primarily from a completely blind biological course of events and not from anybody's intentions, not from conscious or unconscious motives of any kind.

More involved forms of thinking, in short, continue to form an integral part of our experience of nature. But in this area of our experience they have become increasingly overlaid and counterbalanced by others which make higher demands on men's faculty of looking at themselves as it were from outside and of viewing what they call "mine" or "ours" as part systems of a larger system. In their experience of nature men have been able, in course of time, to form and to face a picture of the physical universe which is emotionally far from satisfactory, which, in fact, seems to become less and less so as science advances, but which at the same time agrees better with the cumulative results of systematic observations. They have learned to impose upon themselves greater restraint in their approaches to natural events and in exchange for the short-term satisfactions which they had to give up they have gained greater power to control and to manipulate natural forces for their own ends, and with it, in this sphere, greater security and other new long-term satisfactions.

III

Thus in their public approaches to nature, men have travelled a long way (and have to travel it again and again as they grow up) from the primary, the childhood patterns of thinking. The road they have travelled is still far from clear. But one can see in broad outline some of its characteristic patterns and mechanisms.

When men, instead of using stones as they found them against human enemies or beasts, with greater restraint of their momentary impulses, gradually changed towards fashioning stones in advance for their use as weapons or tools (as we may assume they did at some time), when, increasing their foresight, they gradually changed from gathering fruits and roots towards growing plants deliberately for their own use, it implied that they themselves as well as their social life and their natural surroundings, that their outlook as well as their actions changed. The same can be said of those later stages in which changes in men's thinking about nature became more and more the task of scientific specialists. Throughout these developments the mastery of men over themselves as expressed in their mental attitudes towards nature and their mastery over natural forces by handling them, have grown together. The level and patterns of detachment represented by public standards of

thinking about natural events were in the past and still are dependent on the level and the manner of control represented by public standards of manipulating them and vice versa.

For a very long time, therefore, men, in their struggle with the non-human forces of nature, must have moved in what appears in retrospect as a vicious circle. They had little control over natural forces on which they were dependent for their survival. Wholly dependent on phenomena whose course they could neither foresee nor influence to any considerable extent, they lived in extreme insecurity, and, being most vulnerable and insecure, they could not help feeling strongly about every occurrence they thought might affect their lives; they were too deeply involved to look at natural phenomena, like distant observers, calmly. Thus, on the one hand, they had little chance of controlling their own strong feelings in relation to nature and of forming more detached concepts of natural events as long as they had little control over them; and they had, on the other hand, little chance of extending their control over their non-human surroundings as long as they could not gain greater mastery over their own strong feelings in relation to them and increase their control over themselves.

The change towards greater control over natural phenomena appears to have followed what in our traditional language might be called "the principle of increasing facilitation". It must have been extremely difficult for men to gain greater control over nature as long as they had little control over it; and the more control they gained, the easier was it for them to extend it.

Nothing in our experience suggests that part-processes of this kind must always work in the same direction. Some of the phases in which they went into reverse gear are known from the past. Increasing social tensions and strife may go hand in hand with both a decrease of men's ability to control, and an increase in the phantasy-content of men's ideas about, natural as well as social phenomena. Whether feed-back mechanisms of this kind work in one or in the other direction depends, in short, on the total situation of the social units concerned.

IV

Paradoxically enough, the steady increase in the capacity of men, both for a more detached approach to natural forces and for controlling them, and the gradual acceleration of this process, have helped to increase the difficulties which men have in extending their control over processes of social change and over their own feelings in thinking about them.

Dangers threatening men from non-human forces have been slowly decreasing. Not the least important effect of a more detached approach in this field has been that of limiting fears, of preventing them, that is, from irradiating widely beyond what can be realistically assessed as a threat. The former helplessness in the face of incomprehensible and unmanageable natural forces has slowly given way to a feeling of confidence, the concomitant, one

might say, of increasing facilitation, of men's power to raise, in this sphere, the general level of well-being and to enlarge the area of security through the application of patient and systematic research.

But the growth of men's comprehension of natural forces and of the use made of them for human ends is associated with specific changes in human relationships; it goes hand in hand with the growing interdependence of growing numbers of people. The gradual acceleration in the increment of knowledge and use of non-human forces, bound up with specific changes in human relations as it is, has helped, in turn, to accelerate the process of change in the latter. The network of human activities tends to become increasingly complex, far-flung and closely knit. More and more groups, and with them more and more individuals, tend to become dependent on each other for their security and the satisfaction of their needs in ways which, for the greater part, surpass the comprehension of those involved. It is as if first thousands, then millions, then more and more millions walked through this world their hands and feet chained together by invisible ties. No one is in charge. No one stands outside. Some want to go this, others that way. They fall upon each other and, vanquishing or defeated, still remain chained to each other. No one can regulate the movements of the whole unless a great part of them are able to understand, to see, as it were, from outside, the whole patterns they form together. And they are not able to visualize themselves as part of these larger patterns because, being hemmed in and moved uncomprehendingly hither and thither in ways which none of them intended, they cannot help being preoccupied with the urgent, narrow and parochial problems which each of them has to face. They can only look at whatever happens to them from their narrow location within the system. They are too deeply involved to look at themselves from without. Thus what is formed of nothing but human beings acts upon each of them, and is experienced by many as an alien external force not unlike the forces of nature.

The same process which has made men less dependent on the vagaries of nature has made them more dependent on each other. The changes which, with regard to non-human forces, have given men greater power and security, have increasingly brought upon them different forms of insecurity. In their relations with each other men are again and again confronted, as they were in the past in their dealings with non-human forces, with phenomena, with problems which, given their present approaches, are still beyond their control. They are incessantly faced with the task of adjusting themselves to changes which though perhaps of their own making were not intended by them. And as these changes frequently bring in their wake unforeseen gains for some and losses for others, they tend to go hand in hand with tensions and frictions between groups which, at the same time, are inescapably chained to each other. Tests of strength and the use of organized force serve often as costly means of adjustment to changes within this tangle of interdependencies; on many of its levels no other means of adjustment exist.

Thus vulnerable and insecure as men are under these conditions, they

cannot stand back and look at the course of events calmly like more detached observers. Again, it is, on the other hand, difficult for men in that situation to control more fully their own strong feelings with regard to events which, they feel, may deeply affect their lives, and to approach them with greater detachment, as long as their ability to control the course of events is small; and it is, on the other hand, difficult for them to extend their understanding and control of these events as long as they cannot approach them with greater detachment and gain greater control over themselves. Thus a circular movement between inner and outer controls, a feedback mechanism of a kind, is at work not only in men's relations with the non-human forces of nature, but also in their relations with each other. But it operates at present in these two spheres on very different levels. While in men's relations with non-human forces the standard of both the control of self and that of external events is relatively high, in relations of men with men the socially required and socially bred standard of both is considerably lower.

The similarities between this situation and that which men had to face in past ages in their relations with the forces of nature, are often obscured by the more obvious differences. We do already know that men can attain a considerable degree of control over natural phenomena impinging upon their lives and a fairly high degree of detachment in manipulating, and in thinking of, them. We do not know, and we can hardly imagine, how a comparable degree of detachment and control may be attained with regard to social phenomena. Yet, for thousands of years it was equally impossible for those who struggled before us to imagine that one could approach and manipulate natural forces as we do. The comparison throws some light on their situation as well as on ours.

V

It also throws some light on the differences that exist to-day between the standards of certainty and achievement of the natural and the social sciences. It is often implied, if it is not stated explicitly, that the "objects" of the former, by their very nature, lend themselves better than those of the latter to an exploration by means of scientific methods ensuring a high degree of certainty. However, there is no reason to assume that social data, that the relations of persons are less accessible to man's comprehension than the relations of non-human phenomena, or that man's intellectual powers as such are incommensurate to the task of evolving theories and methods for the study of social data to a level of fitness, comparable to that reached in the study of physical data. What is significantly different in these two fields is the situation of the investigators and, as part of it, their attitudes with regard to their "objects"; it is, to put it in a nutshell, the *relationship between "subjects" and "objects"*. If this relationship, if situation and attitudes are taken into account the problems and the difficulties of an equal advance in the social sciences stand out more clearly.

The general aim of scientific pursuits is the same in both fields ; stripped of a good many philosophical encrustations it is to find out in what way perceived data are connected with each other. But social as distinct from natural sciences are concerned with conjunctions of persons. Here, in one form or the other, men face themselves ;¹ the " objects " are also " subjects ". The task of social scientists is to explore, and to make men understand, the patterns they form together, the nature and the changing configuration of all that binds them to each other. The investigators themselves form part of these patterns. They cannot help experiencing them, directly or by identification, as immediate participants from within ; and the greater the strains and stresses to which they or their groups are exposed, the more difficult is it for them to perform the mental operation, underlying all scientific pursuits, of detaching themselves from their role as immediate participants and from the limited vista it offers.

There is no lack of attempts in the social sciences at detaching oneself from one's position as an involved exponent of social events, and at working out a wider conceptual framework within which the problems of the day can find their place and their meaning. Perhaps the most persistent effort in that direction has been made by the great pioneering sociologists of the nineteenth and early twentieth centuries. But their work also shows most conspicuously the difficulties which, under present conditions, stand in the way of such an attempt. On the one hand, they all attempted to discover, from one angle or the other, the inherent order of the social development of mankind, its " laws " as some of them called it. They tried to work out a comprehensive and universally valid theoretical framework within which the problems of their own age appeared as specific problems of detail and no longer as the central problem from which those of other ages received their relevance and their meaning. And yet, on the other hand, they were so deeply involved in the problems of their own society that they often viewed in fact the whole development of men's relations with each other in the light of the hopes and

¹ The problem of " facing oneself " is no doubt far more complex than can be shown here. It plays its part in explorations of nature as well as in those of society. For man forms part of both. Every major change in men's conception of nature, therefore, goes hand in hand with a change of the picture they have of themselves. So does any change in their conception of the social universe. Success and failure of any attempt to change from a more involved to a more detached view of social phenomena is bound up with the capacity of men to revise the picture they have of themselves in accordance with the results of more methodical studies, and often enough in a way which runs counter to deeply felt beliefs and ideals. In that respect the problem of increasing detachment in the social sciences is hardly different from that which plays its part in the development of the natural sciences.

However, it must still be regarded as an open problem how far men are capable of " facing themselves ", of seeing themselves as they are without the shining armour of fantasies shielding them from suffering past, present and future. It is fairly safe to say that their capacity to do so grows and declines with the degree of security which they enjoyed and enjoy. But it probably has its limits.

However that may be, at present such problems can be discussed only in societies which demand and produce a high degree of individualization and in which men are being brought up to experience themselves, more perhaps than ever before, as beings set apart from each other by very strong walls. There can be little doubt that the picture of self which is thus built up in the growing person makes it rather difficult to envisage oneself in a more detached manner as forming patterns with others and to study the nature and structure of these patterns as such.

fears, the enmities and beliefs resulting from their role as immediate participants in the struggles and conflicts of their own time. These two forms of approach—one more involved which made them see the development of human society as a whole in the light of the pressing problems of their own time, the other more detached which enabled them to visualize the short-term problems of their own time in the light of the long-term development of society—were so inextricably interwoven in their work that, in retrospect, it is difficult to sift one from the other and to sort out their contribution to the development of a more universally valid system of theories about men in society from ideas relevant only as an expression of their own ideals and idiosyncrasies in the struggles of a particular historical period.

Since then, a good deal more factual material about social phenomena has been brought to light. The elaboration of a more impersonal body of theories and their adjustment to a widening range of observed facts brought to light under their guidance, has considerably advanced in some social sciences, and advanced in some more than in others.¹ To a greater or lesser extent, research in all human sciences still tends to oscillate between two levels of consciousness and two forms of approach, the one more akin, one might say, to a simple geocentric, the other more to a heliocentric approach. And the constant upsurge of the former in connection with acute social and political tensions effectively bars in most social sciences the steady continuity of research which has become so marked a characteristic of many natural sciences.

¹ The evident differences in the levels of development of different social sciences have perhaps not found quite the attention they deserve as a subject of research. Like the differences in the development of natural and social sciences generally, they are relevant to any theory of knowledge and of sciences.

To set out here more comprehensively the problems raised by such differences would require an exposition of the wider theory of knowledge implied in these observations on detachment and involvement; it would require fuller elaboration of the general conceptual framework that has been used here and within which, as one has seen, the development of scientific thinking, as of thinking in general, and that of changes in the situation of those who think, instead of being allotted to largely independent fields of studies, are linked to each other as different, but inseparable and interdependent facets of the same process. Only with the help of such an integrating framework is it possible to determine with greater precision different stages and levels of thinking and knowing whether or not one adopts concepts like "level of detachment", "level of fitness", "level of control" and others which have been used here.

On these lines, one might say, for example, that, under present conditions, anthropologists have a better chance of developing theories on human relations to a higher level of fitness than, say, those engaged in the study of highly differentiated societies to which they themselves belong or which are antagonists or partners of societies to which they belong; they have a better chance, not only because it is easier to survey, and to form relatively fitting theories about, social units which are small and not too complex in structure, but also because the investigators themselves are, as a rule, less directly involved in the problems they study. Anthropologists, in most cases, study societies to which they do not belong, other sociologists mostly societies of which they are members.

But in saying this, one refers only to one facet of the relationship between the mode of thinking and the situation of those who think. To complete the nexus one would have to add that the more detached theoretical tools of thinking which anthropologists have a chance to build up in accordance with their specific situation, can themselves act, within certain limits, as a shield against the encroachment upon their scientific work, and perhaps even on their personal outlook, of more involved, more emotive forms of thinking, even if tensions mount between social units to which they belong as participant members and others in relation to which they play mainly the part of investigators.

Here, too, in comparative studies on the development of social sciences, it may be more appropriate and more profitable to focus on the relations of observers and observed than on either of them or on "methods" alone.

The pressure of short-term problems which can no longer be solved in traditional ways, of social problems which appear to require for their solution procedures evolved and employed by scientific specialists, has increased together with the complexity of human relations itself. Fragmentation of social research has grown apace. Even as an aim of research the idea of a wider theoretical framework connecting and unifying the problems and results of more limited inquiries has become more remote; to many it appears unattainable, to others, in addition, undesirable. For the immediate difficulties of men springing up in their own midst from the unmanageable forces of social change, from conflicts and frictions among themselves, have remained exceedingly great. The strength of involvements, within the social context of men's lives, if it has not actually increased, has hardly lessened.

Hence, whatever else may have changed since the days of the pioneering sociologists, certain basic characteristics of the social sciences have not. For the time being, social scientists are liable to be caught in a dilemma. They work and live in a world in which almost everywhere groups, small and great, including their own groups, are engaged in a struggle for position and often enough for survival, some trying to rise and to better themselves in the teeth of strong opposition, some who have risen before trying to hold what they have and some going down.

Under these conditions the members of such groups can hardly help being deeply affected in their thinking about social events by the constant threats arising from these tensions to their way of life or to their standards of life and perhaps to their life. As members of such groups scientific specialists engaged in the study of society share with others these vicissitudes. Their experience of themselves as upholders of a particular social and political creed which is threatened, as representatives of a specific way of life in need of defence, like the experience of their fellows, can hardly fail to have a strong emotional undertone. Group-images, those, for instance, of classes or of nations, self-justifications, the cases which groups make out for themselves, represent, as a rule, an amalgam of realistic observations and collective fantasies (which like the myths of simpler people are real enough as motive forces of action). To sift out the former from the latter, to hold up before these groups a mirror in which they can see themselves as they might be seen, not by an involved critic from another contemporary group, but by an inquirer trying to see in perspective the structure and functioning of their relationship with each other, is not only difficult in itself for anyone whose group is involved in such a struggle; expressed in public, it may also weaken the cohesion and solidarity feeling of his group and, with it, its capacity to survive. There is, in fact, in all these groups a point beyond which none of its members can go in his detachment without appearing and, so far as his group is concerned, without becoming a dangerous heretic, however consistent his ideas or his theories may be in themselves and with observed facts, however much they may approximate to what we call the "truth".

And yet, if social scientists although using more specialized procedures

and a more technical language are in the last resort not much less affected in their approach to the problems of society by preconceived ideas and ideals, by passions and partisan views than the man in the street, are they really justified in calling themselves "scientists"? Does any statement, any hypothesis or theory deserve the epithet "scientific", if it is ultimately based on dogmatic beliefs, on *a priori* assumptions, on ideas and evaluations which are impervious to arguments based on a more systematic and dispassionate examination of the available evidence? Can social scientists make any specific contribution to the solution of major problems even of their own groups, of their own country, class, profession or whatever it is, if they accept as the self-evident foundation of their theories some of the religiously held creeds and norms of one or the other of these groups so that the results of their studies are destined from the start to agree, or at least not to disagree, with the basic tenets of these communal beliefs? Without greater detachment and autonomy of thinking, can they hope to put in the hands of their fellow-men more fitting tools of thinking and more adequate blueprints for the handling of social and political problems—more adequate blueprints than those handed on unreflectingly from generation to generation or evolved haphazardly in the heat of the battle? And even if they do not accept such beliefs unquestioningly, are they not often impelled to use them as the general frame of reference for their studies simply by sentiments of solidarity, of loyalty or perhaps of fear? Are they not sometimes only too justified in thinking that it might weaken a cause which they regard as their own if they were to subject systematically the religiously held social creeds and ideals of one of their own groups to a more dispassionate scientific examination, that it might put weapons in the hand of opponents or that, as a result, they themselves might be exposed to ostracism if to nothing worse?

The dilemma underlying many of the present uncertainties of the sciences of men is, as one can see, not simply a dilemma of this or that historian, economist, political scientist or sociologist (to name only some of the present divisions); it is not the perplexity of individual social scientists, but that of social scientists as a professional group. As things stand, their social task as scientists and the requirements of their position as members of other groups often disagree; and the latter are apt to prevail as long as the pressure of group tensions and passions remains as high as it is.

The problem confronting them is not simply to discard the latter role in favour of the former. They cannot cease to take part in, and to be affected by, the social and political affairs of their groups and their time. Their own participation and involvement, moreover, is itself one of the conditions for comprehending the problems they try to solve as scientists. For while one need not know, in order to understand the structure of molecules, what it feels like to be one of its atoms, in order to understand the functioning of human groups one needs to know, as it were, from inside how human beings experience their own and other groups, and one cannot know without active participation and involvement.

The problem confronting those who study one or the other aspects of human groups is how to keep their two roles as participant and as inquirer clearly and consistently apart and, as a professional group, to establish in their work the undisputed dominance of the latter.

This is so difficult a task that many representatives of social sciences, at present, appear to regard the determination of their inquiries by preconceived and religiously held social and political ideals as inevitable. They often seem to consider these heteronomous foundations of their pronouncements as characteristic, not of a specific situation and, within it, of a specific dilemma, but of their subject-matter as such. The latitude they allow each other in their use of dogmatic ideals and evaluations as a basis for the setting of problems, the selection of material and the construction of theories is very wide ; and is apt to become wider still whenever the pressure of tensions and passions mounts in society at large.

VI

The chance which social scientists have to face and to cope with this dilemma might be greater if it were not for another characteristic of their situation which tends to obscure the nature of these difficulties. That is the ascendancy gained, over the centuries, by a manner or style of thinking which has proved highly adequate and successful in men's dealings with physical events, but which is not always equally appropriate if used in their dealings with others. One of the major reasons for the difficulties with which men have to contend in their endeavour to gain more reliable knowledge about themselves is the uncritical and often dogmatic application of categories and concepts highly adequate in relation to problems on the level of matter and energy to other levels of experience and among them to that of social phenomena. Not only specific expectations as to how perceived data are connected with each other, specific concepts of causation or of explanation formed in this manner are generalized and used almost as a matter of course in inquiries about relations of men ; this mechanical diffusion of models expresses itself, too, for example, in the widespread identification of "rationality" with the use of categories developed mainly in connection with experiences of physical events, and in the assumption that the use of other forms of thinking must necessarily indicate a leaning towards metaphysics and irrationality.

The same tendency towards over-generalization shows itself in many current ideas of what is and what is not scientific. By and large, theories of science still use as their principal model the physical sciences—often not in their contemporary, but in their classical form. Aspects of their procedures are widely regarded as the most potent and decisive factor responsible for their achievements and as the essential characteristic of sciences generally. By abstracting such aspects from the actual procedures and techniques of the physical sciences, one arrives at a general model of scientific procedure

which is known as "the scientific method". In name, it represents the distinguishing characteristics common to all scientific, as distinct from non-scientific, forms of solving problems. In fact, it often constitutes a curious compound of features which may be universal with others characteristic of the physical sciences only and bound up with the specific nature of their problems. It resembles a general concept "animal" formed without reference to the evolutionary diversity and connections of animal species from a rather restricted observational field so that structures and functions common perhaps to all animals, as distinct from non-living things and from plants, mingle in it with others characteristic only of certain types of animals, of, say, mammals or of vertebrates.

The assumption is that in this generalized form "the scientific method" can be transferred from the field where it originated, from the physical sciences, to all other fields, to biological as well as to social sciences, regardless of the different nature of their problems; and that wherever it is applied it will work its magic. Among social scientists in particular it is not uncommon to attribute difficulties and inadequacies of their work to the fact that they do not go far enough in copying the method of physical sciences. It is this strong concentration of their attention on problems of "method" which tends to obscure from their view the difficulties that spring from their situation and from their own approaches to the problems they study.

The superior achievement and status of the physical sciences itself constitutes a highly significant factor in the situation of those who work in the field of social sciences. If, as participants in the life of a turbulent society, they are constantly in danger of using in their inquiries preconceived and immovable social convictions as the basis for their problems and theories, as scientists they are in danger of being dominated by models derived from inquiries into physical events and stamped with the authority of the physical sciences.

The fact itself that people confronted with the task of formulating and exploring new sets of problems model their concepts and procedures on those which have proved their worth in other fields is in no way surprising or unique. It is a recurrent feature in the history of men that new crafts and skills, and among them new scientific specialisms, in the early stages of their development, continue to rely on older models. Some time is needed before a new group of specialists can emancipate itself from the ruling style of thinking and of acting; and in the course of this process their attitude towards the older groups, as in other processes of emancipation, is apt to oscillate: they may go too far for a while and may go on too long in their uncritical submission to the authority and prestige of the dominant standards; and then again, they may go too far in their repudiation and in their denial of the functions which the older models had or have in the development of their own. In most of these respects the emergence of the younger social sciences from under the wings of the older natural sciences follows the usual pattern.

But there can have been rarely a situation in which the gradient between

the comparatively high level of detachment manifest in the older branches of knowledge and the much lower represented by the younger branches was equally steep. In the physical sciences, it is not only the development and use of a specific method for the solution of problems and the testing of theories, but the framing of problems and theories itself which presupposes a high standard of detachment. The same method transferred to social sciences is not infrequently used for the exploration of problems and theories conceived and studied under the impact of strong involvements. Hence the use, in social sciences, of a method akin to that evolved in the physical sciences often gives to the former the appearance of a high level of detachment or of "objectivity" which those who use this method are in fact lacking. It often serves as a means of circumventing difficulties which spring from their dilemma without facing it; in many cases, it creates a facade of detachment masking a highly involved approach.

As a result, a crucial question is often regarded as sealed and solved which in fact is still in abeyance: the question which of the procedures and techniques of the physical sciences are commensurate to the task of social sciences and which are not. The abstraction from these specific procedures of a general model of the scientific method, and the claim often made for it as the supreme characteristic of research that is scientific, have led to the neglect, or even to the exclusion from the field of systematic research, of wide problem-areas which do not lend themselves easily to an exploration by means of a method for which the physical sciences have provided the prototype. In order to be able to use methods of this kind and to prove themselves scientific in the eyes of the world, investigators are frequently induced to ask and to answer relatively insignificant questions and to leave unanswered others perhaps of greater significance. They are induced to cut their problems so as to suit their method. The exclusive and seemingly final character of many current statements about the scientific method finds expression in the strange idea that problems which do not lend themselves to investigations by means of a method modelled on that of the physical sciences are no concern of people engaged in scientific research.

On closer investigation, one will probably find that the tendency to consider a highly formalized picture of this one set of sciences and their method as the norm and ideal of scientific inquiries generally is connected with a specific idea about the aim of sciences. It is, one might think, bound up with the assumption that among propositions of empirical sciences, as among those of pure mathematics and related forms of logic, the only relevant distinction to be made is that between propositions which are true and others which are false; and that the aim of scientific research and of its procedures is simply and solely that of finding the "truth", of sifting true from false statements. However, the goal towards which positive sciences are striving is not, and by their very nature cannot be, wholly identical with that of fields like logic and mathematics which are concerned with the inherent order of certain tools of thinking alone. It certainly happens in empirical investiga-

tions that people make statements which are simply found to be false. But often enough rough dichotomies like "true" and "false" are highly inadequate in their case. People engaged in empirical research often put forward propositions or theories whose merit is that they are truer than others or, to use a less hallowed term, that they are *more* adequate, *more* consistent both with observations and in themselves. In general terms, one might say it is characteristic of these scientific as distinct from non-scientific forms of solving problems that, in the acquisition of knowledge, questions emerge and are solved as a result of an uninterrupted two-way traffic between two layers of knowledge: that of general ideas, theories or models and that of observations and perceptions of specific events. The latter if not sufficiently informed by the former remains unorganized and diffuse; the former if not sufficiently informed by the latter remains dominated by feelings and imaginings. It is the objective of scientists, one might say, to develop a steadily expanding body of theories or models and an equally expanding body of observations about specific events by means of a continuous, critical confrontation to greater and greater congruity with each other. The methods actually used in empirical investigations, inevitably, vary a good deal from discipline to discipline in accordance with the different types of problems that present themselves for solution. What they have in common, what identifies them as scientific methods is simply that they enable scientists to test whether their findings and pronouncements constitute a reliable advance in the direction towards their common objective.

VII

Is it possible to determine with greater precision and cogency the limitations of methods of scientific research modelled on those of the physical sciences? Can one, in particular, throw more light on the limits to the usefulness of mathematical or, as this term is perhaps too wide in this context, of quantifying models and techniques in empirical researches?

At the present state of development, the weight and relevance of quantifying procedures clearly differs in different problem-areas. In some, above all in the physical sciences, one can see to-day no limit to the usefulness of procedures which make relations of quantities stand for the non-quantitative aspects of the relations of data; the scope for reducing other properties to quantities and for working out, on the basis of such a reduction, highly adequate theoretical constructs appears to be without bounds.

In other fields of research the scope for similar reductions is clearly very much narrower; and theoretical constructs based on such reductions alone often prove far less adequate. Have problem-areas which do not lend themselves as well as the physical sciences to the application of quantifying methods of research certain general properties which can account for such differences in the scope and relevance of quantifying procedures as instruments of research?

It is possible to think that this problem itself can be readily solved in terms of quantities alone. As one passes from studies of matter and energy and its various transformations to those of organisms and their development as species and individuals and again to studies of men as societies and individuals (in not quite the same sense of the word), according to a not uncommon view, the problems which one encounters becomes more complex ; the greater complexity is often thought to follow from the fact that the number of interacting parts, factors, variables or suchlike increase as one moves from the study of inorganic matter to those of organisms and of men ; and as a result of this increase in numbers, so the argument seems to run, measurements and mathematical operations generally, become more and more complicated and difficult. If one accepts the idea that it is the aim of scientific investigations everywhere to explain the behaviour of composite units of observation by means of measurements from that of their simpler constituent parts, each of the variables affecting the behaviour of such a unit would have to be measured by itself so as to determine the quantitative aspects of its relations with others. The greater the number of variables, the greater would be the number of measurements and the more complicated would be the mathematical operations necessary to determine their interplay. In the light of this hypothesis the demands made on the resources in manpower, in computing machines, in mathematical techniques and in money and time would progressively increase from one set of sciences to the other with the increase in the number of factors that has to be taken into account. More and more, these demands would become prohibitive and research on quantitative lines alone would no longer be possible. According to this view, it is for that reason that one has to resign oneself to the use of less precise and less satisfactory methods of investigation in many fields of studies.

In a way, this approach to the observable limitations of quantifying methods in research is itself not uncharacteristic of the manner in which forms of thinking most serviceable in the exploration of physical data become distended into what almost represents a general style of thinking. The choice of a heap of more and more factors or variables as a model for increasing complexity is determined by a general expectation which is evidently based on experiences in physical research, but which tends to assume the character of an *a priori* belief : by the expectation that problems of all kinds can be satisfactorily solved in terms of quantities alone.

However, the area within which this expectation can be safely used as a guide to the formulation of problems and theories has very definite limits. The properties of different units of observation characteristic of different disciplines are not alone affected by the number of interacting parts, variables, factors or conditions, but also by the manner in which constituents of such units are connected with each other. Perhaps the best way to indicate briefly this aspect of these differences is the hypothetical construction of a model of models which represent different frames of reference of scientific problems in a highly generalized form as composite units arranged according

to the extent of interdependence of their constituents or, more generally, according to the degree of organization which they possess.

Arranged in this manner, this continuum of models would have one pole formed by general models of units, such as congeries, agglomerations, heaps or multitudes, whose constituents are associated with each other temporarily in the loosest possible manner and may exist independently of each other without changing their characteristic properties. The other pole would be formed by general models of units such as open systems and processes which are highly self-regulating and autonomous, which consist of a hierarchy of interlocking part-systems and part-processes and whose constituents are interdependent to such an extent that they cannot be isolated from their unit without radical changes in their properties as well as in those of the unit itself.

Between these two poles would be spaced out intermediary models¹ graded according to the degree of differentiation and integration of their constituents.

As one moves along this continuum of models from paradigms of loosely composed to others of highly organized units, as models of congeries step by step give way to those of self-regulating open systems and processes with more and more levels many of the devices developed for scientific research into units of the first type change, or even lose, their function. In many cases, from being the principal instruments and techniques of research, they become, at the most, auxiliaries.

Less adequate, in that sense, becomes the concept of an independent variable of a unit of observation which is otherwise kept invariant and, with it, the type of observation and experimentation based on the supposition that what one studies is a heap of potentially independent variables and their effects.

Less adequate, too, becomes the concept of a scientific law as the general theoretical mould for particular connections of constituents of a larger unit. For it is one of the tacit assumptions underlying both the conception and the establishment of a scientific law that the phenomena of which one wishes to state in the form of a law that the pattern of their connection is necessary and unchanging, do not change their properties irreversibly if they are cut off from other connections or from each other. The type of relationship whose regularity can be fairly satisfactorily expressed in the form of a law is a relationship which is impermanent though it has a permanent pattern: it can start and cease innumerable times without affecting the behaviour of other constituents of the larger nexus within which it occurs or the properties

¹ Even in the elementary form in which it is presented here, such a serial model may help to clarify the confusion that often arises from an all too clear-cut dichotomy between congeries and systems. Not all frames of reference of physical problems cluster narrowly around the congeries pole of the model. Not all frames of reference of biological or sociological problems have their equivalent close to the other pole. They are, in each of these areas of inquiry, more widely scattered than it is often assumed. And although, in each of these areas, their bulk can probably be assigned to a specific region of the serial model, frames of reference of the problems of different disciplines, projected on this model, frequently overlap.

of the larger nexus itself. General laws for particular cases, in short, are instruments for the solution of problems whose referential frame is conceived as a congeries.¹

The more the framework of problems resembles in its characteristics a highly self-regulating system and process, the greater in other words the chance that constituents are permanently connected with each other so that they are bound to change their properties irrevocably if these connections are severed, the more likely is it that laws assume a subsidiary role as tools of research ; the more does one require as the paramount vehicle for exploring and presenting regularities of part-connections, system and process-models clearly representative of the fact that part-events are linked to each other as constituents of a functioning unit without which they would not occur or would not occur in this manner.

Nor do those time-honoured intellectual operations known as induction and deduction retain quite the same character throughout this continuum of models. In their classical form they are closely linked up with intellectual movements up and down between discrete and isolated universals, which may be general concepts, laws, propositions or hypotheses, and an infinite multitude of particular cases which are also conceived as capable of preserving their significant characteristics if they are studied in isolation independently of all other connections.

When models of multitudes become subordinate to models of highly organized systems another type of research operation gains greater prominence modifying to some extent those of induction and deduction, namely movements up and down between models of the whole and those of its parts.

It is difficult to think of any well established terms expressing clearly the differential qualities and the complementary character of these two opera-

¹ In the case of the second law of thermodynamics an experimental and statistical law has been interpreted as a statement about qualities possessed by the referential system as a whole, that is by the physical universe. However, if one may use experiences in other fields as a model, it is not always safe to assume that properties observed as those of constituent parts of a system are also properties of the system as a whole. Whether or not one is justified, in this case, to assume that regularities observed in a part-region of a system, in a part-region of both time and space, can be interpreted as regularities of the whole system only physicists are entitled to judge.

However, these general considerations about laws are hardly affected by this case. In physics as in other scientific disciplines the referential framework of problems is far from uniform. Although, in the majority of cases, the units of observation are simply conceived as heaps, there are others in which they are envisaged as units endowed with properties approaching to those of systems. But compared with the models of systems and processes developed in some of the biological and some of the social sciences those which have been produced in physical sciences show, on the whole, a relatively high independence of parts and a relatively low degree of organization.

This may or may not account for the fact that although the status of laws, in the classical sense of the words, has to some extent declined in the physical sciences with the ascendance of models which have some of the characteristics of systems, the change does not appear to be very pronounced. What apparently has become more pronounced is the implied expectation that the diverse laws discovered in studies of isolated connections will eventually coalesce and form with each other a comprehensive theoretical scaffolding for the behaviour of the over-all system as a whole. Perhaps it is not yet quite clear why one should expect that the unconnected clusters of connections whose regularities one has more or less reliably determined will subsequently link up and fall into pattern. To expect that they will do so, at any rate, means assuming that in the end all congeries including that of energy-matter will turn out to be systems of a kind or aspects and parts of systems.

tions. Perhaps one might call "analytical" those steps of research in which the theoretical representation of a system is treated more or less as a background from which problems of constituent parts stand out as the prime object of research and as a potential testing-ground for theoretical representations of the whole; and one might call "synoptic" (not to say "synthetic") those steps which are aimed at forming a more coherent theoretical representation of a system as a whole as a unifying framework and as a potential testing-ground for relatively unco-ordinated theoretical representations of constituent parts. But whatever the technical terms, one can say that the solution of problems whose framework represents a highly integrated unit depends in the long run on the co-ordination and balance between steps in both directions.

In the short run, synopsis may be in advance of analysis. Its theoretical results have in that case, at the worst, the character of speculations, at the best, if they are conformable to a larger body of observational and theoretical fragments, that of working hypothesis. Many of the ideas put forward by the pioneering sociologists of the nineteenth century, preoccupied as they were with the process of mankind as a whole, illustrate this stage. Or else analysis may be in advance of synopsis. In that case, knowledge consists of a plethora of observational and theoretical fragments for which a more unified theoretical framework is not yet in sight. A good deal of the work done by sociologists during part of the twentieth century can serve as an illustration of that stage. Many of them, in reaction from the more speculative aspects of the work done by the system-builders which preceded them, became distrustful of any over-all-view and of the very idea of "systems" itself; they confined themselves more and more to the exploration of isolated clusters of problems which could be explored as nearly as possible by methods used by representatives of other sciences though they themselves lacked what these others already possessed: a more unified, more highly integrated system of theoretical constructs as a common frame of reference for isolated studies of part-connections.

In the case of units of observation such as multitudes and populations it is an appropriate aim of research to develop theoretical models of a composite unit as a whole by treating it as the sum total of its components and by tracing back its properties to those of its parts. But this reduction of the whole to its parts becomes increasingly less appropriate if one moves within the continuum of models towards more highly organized units. As the constituents of such units lose their identity if their connection with others is broken off, as they become and remain what they are only as functioning parts of a functioning system of a specific type, or even of an individual system, the study of temporary isolates is useful only if its results are again and again referred back to a model of their system; the properties of parts cannot be adequately ascertained without the guidance provided by a theoretical model of the whole. At an early stage in the development of a particular field of problems such models, like maps of largely unexplored regions, may

be full of blanks and perhaps full of errors which can be corrected only by further investigations of parts. But however much one or the other may lag behind, studies on the level of the whole system and studies on the level of part-units are greatly impeded if they cannot rely on a measure of correspondence and co-ordination which allows scientists to move the focus of their observations and reflections freely from one level to the other.

VIII

The difficulty is that there are often more than two levels to be considered. Highly structured systems and processes have often parts which are also systems and processes; and these in turn may have parts which again are developing systems though with a smaller measure of autonomy. In fact, such systems within systems, such processes within processes may consist of many levels of varying relative strength and controlling power interlaced and interlocked with each other; so that those who are digging up knowledge on one of them stand in need of free channels of communication with others who are working in the many galleries above and below and, at the same time, of a clear conception of the position and functions of their own problem-area, and of their own situation, within the whole system.

In practice, such lines of communication are often deficient or non-existent. Problems on different levels are frequently investigated by different groups of specialists who look hardly beyond their particular pitch. Many of them draw from limited experiences with problems characteristic of one level, or merely of one of its aspects, inferences for the solution of problems whose frame of reference comprises many levels or perhaps the whole system. And if one of these groups, if, as it has in fact happened, specialists for the study of units which represent a relatively low level of organization, such as physicists, are greatly in advance of others in the exploration of their level and the development of corresponding techniques, the unselect imitation of their models and methods in studies of more highly organized units is likely to give rise to a welter of misconceived problems.

For not only the whole system, but also each of its constituent systems may display patterns of connections and regularities which are different and which cannot be deduced from those of their constituent systems. Theoretical models and methods of research designed for the study of units which are less differentiated and integrated, can be, therefore, at best, only partially appropriate as means of research into more highly organized units even if the latter contain the former or homologues of the former as constituent parts.

There are many instances of the difficulties that can ensue from the application of models designed for the study of part-systems at one level of organization to that of systems at another level or of the paramount-system as a whole.

Take, for example, the old controversy about the usefulness of physical

systems such as machines as explanatory models for biological systems such as animals and men. If one adheres to the traditional way of thinking, one can usually perceive only two possible solutions to the focal problem of this controversy. One can either accept physical systems of one kind or the other as complete models for organisms and assume, explicitly or not, that an organism as a whole is a set of physical events on exactly the same level as physical events outside organisms. Or one can adopt vitalistic models and assume that special non-physical forces are at work in organisms which account for the observable differences between living and non-living systems.

In order to accept either of these two alternatives, one has to stretch a good many points. As in other cases in which it is difficult, not simply to find a solution for a problem, but to think of any possible model for a solution which would fit the available evidence reasonably well, it is the type of available models rather than the evidence which requires re-examination. The difficulties with which men have met, at least since the days of Descartes, in tackling the question whether or not living systems can be adequately explained by analogies with non-living systems are closely bound up with the tradition of thinking which decrees that the behaviour of whole units has to be explained from that of their parts. It becomes less difficult to conceive of a more fitting model for the solution of this question if it is accepted that there are types of problems which require a different approach—problems which can be brought nearer solution only if one is aware that the units under observation have properties which cannot be inferred from those of their parts.

Man-made machines, as we know them, are homologues not of all, but only of some levels in the hierarchic order of open systems represented even by animals of a simpler type. As each system of a higher order may have properties different from those lower-order systems which form its parts and as animals rising in the evolutionary scale represent systems within systems on a steadily rising number of levels, one would expect the behaviour and characteristics of organisms to correspond only partially to those of machines or of chains of chemical reactions; one would expect organisms to display characteristics which are only in some regards similar to, but in others different from, physical systems, and yet to reveal themselves as nothing but heaps of physical particles if their many-levelled organization is destroyed or if component parts are studied in isolation.

But one could no longer expect, in that case, that all problems of organisms will be solved in the end by analogies with machines or with other physical systems and that biological sciences will gradually transform themselves into physical sciences. In living systems physical processes are patterned and organized in a way which induces further patterning and organizing of these processes. Even if men should succeed in constructing artefacts with very much more and much higher levels of organization and control than those of any known machine, artefacts which could build and rebuild their own structure from less highly organized materials, which could grow and develop,

feel and reproduce themselves, one would have to apply to their construction and to their study biological as well as physical categories and models.

In controversies between vitalists and mechanists, both sides take it more or less for granted that the model of explanation according to which studies in the properties of parts are expected to provide the key for the problems presented by those of the whole, is a universal model. In fact, it is a specific and partial model appropriate only to the study of units on a relatively low level of organization.¹

Or take the much discussed question of the relationship between the behaviour of higher animals and that of men. Attempts to explain the latter in terms of the former are not uncommon. Yet, again, one cannot comprehend the functioning and structure of systems which embody a higher level of organization and control alone in terms of others which are less highly organized even if the former are the descendants of the latter. While men function partly as other animals do, as a whole they function and behave in a way no other animal does.

The change towards greater cortical dominance (to mention only one aspect of these differences) provides a useful illustration of the way in which an increase in the controlling and co-ordinating power of a part-system on a very high level in the hierarchy of interlocking systems goes hand in hand with changes in the equilibrium and the functioning of systems on all levels and with a transmogrification of the over-all system itself. It is to differences such as these that one will have to turn in order to establish more clearly and more firmly that and why the sciences of men cannot be expected to transform themselves, sooner or later, into a branch of the biological sciences even though results of studies into aspects of men within the competency of the latter form an integral element of the former.

Finally, similar problems and similar difficulties can be found, again on a different level and in a different form, in the long drawn-out dispute about the relationship of "individual" and "society". Again, one seems to be left with the choice between two equally unsatisfactory alternatives. However much one may try one's hand at some kind of compromise, on the whole, opinions are so far arrayed in two more or less irreconcilable camps. One can place oneself nearer those who think of societies as heaps or masses of individual people and of their properties and their development, simply as the outcome of individual intentions and activities; and one can place oneself nearer those who think of societies, of social processes in all their various aspects, more or less as if they existed in some sense outside and apart from the individual people by whom they are formed.

Common to both sides, again, is a style of thinking, an idea as to how

¹ One need hardly say that the same argument holds good with regard to the old dispute about the relationship of what is traditionally called "body" and "mind". In this case too proposals for the solution of the problem on purely physical and on metaphysical lines are usually representative of the same style of thinking and equally inept. They may be monistic or dualistic; they may credit the "mind" with qualities of "matter" or "matter" with qualities of the "mind", all these propositions try to account for the whole in terms of its parts.

phenomena ought to be explained, which has been found most serviceable in men's attempts to explain, and to gain control over, physical events. But in this case the impasse is not only due to the uncritical transfer of models of thinking from one field to another. Attempts to work out better theoretical models for the relationship of individual and society suffer even more from the fact that this relationship has become, in our age, one of the focal points, if not *the* focal point, in the clash of value systems, of social beliefs and ideals which divide some of the most powerful groupings of men. In society at large, the question what the rights and duties of individuals in society *ought* to be, or whether the wellbeing of society *ought* to be considered as more important than that of individuals, and other questions of this kind, are evocative of a wide range of practical issues which are highly controversial. Answers to such questions form in many cases the shibboleth by which followers of different social and political creeds recognize friend and foe. As a result, reinforced as it constantly is by tensions and passions of rivalling groups, the question as to what the relationship of individual and society ought to be tends to mask and to muffle in discussions and studies the other as to what kind of relationship it actually is—so much so that the simple question of fact often appears to be almost incomprehensible. And as it so happens that this factual question is representative of one of the basic problems of the social sciences, the difficulties which stand in the way of any attempt to distinguish and to detach it clearly from the topical social and political questions which are often expressed in similar terms constitute one of the major barriers to the further development of the social sciences and particularly to that of sociology.

What has been said, so far, about other types of part-whole relationships can be of some help, if not in solving, at least in clarifying this problem. In many respects the relationship between men as individuals and men as societies differs from these other types. It is quite unique, and not all its features fit entirely in the schema of a part-whole relationship. At the same time, it shows many of its characteristics and presents many of the problems generally associated with it.

All societies, as far as one can see, have the general characteristics of systems with sub-systems on several levels of which individuals, as individuals, form only one. Organized as groups, individuals form many others. They form families; and then again on a higher level, as groups of groups, villages or towns, classes or industrial systems and many similar structures which are interlocked and which may form with each other an over-all system, such as tribes, city-states, feudal kingdoms or nation-states, with a dynamic power-equilibrium of its own. This, in turn, may form part of another less highly organized, less well integrated system; tribes may form with each other a federation of tribes; nation-states a balance-of-power-system. In this hierarchy of interlocking social units the largest unit need not be the most highly integrated and organized unit; so far in the history of mankind it never was. But whatever form it may take, that system in the hierarchy of

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systems which constitutes the highest level of integration and organized power is also the system which has the highest capacity to regulate its own course. Like other open systems, it can disintegrate if the pressure of tensions from within or without becomes too strong. As long as its organization remains more or less intact, it has a higher degree of autonomy than any of its constituents.

And it is the structure and development of this system which in the last resort determines those of its part-systems including those of its individual members. Different levels in this hierarchy of systems, such as individuals as such or as families or as classes, have a greater or smaller measure of autonomy ; they may, for example, co-operate or they may fight with each other. But the scope for autonomous actions varies with the properties of the paramount system as well as with the location of part-units within it ; and so does the basic personality structure of its individual members. For on the properties and the development of this system depend those of the institutionalized set of relationships which we call " family " ; this, in turn, induces the organization and integration of functions in individual children who as adults will be called upon to carry on, to develop and perhaps to change the institutions of the paramount system which, by means of this and of other homeostatic devices, is enabled to perpetuate at least some of its distinguishing characteristics.

Thus unique as the relationship of " individual " and " society " is, it has this in common with other part-whole relationships characteristic of highly organized, self-regulating systems that the regularities, the attributes and the behaviour of systems on different levels and above all those of the paramount system itself cannot be described simply in terms appropriate to those of their parts ; nor can they be explained as effects of which their constituents are the cause. And yet they are nothing outside and apart from these constituents.

Those who approach social phenomena, wittingly or unwittingly, as if societies were nothing but heaps of individual people and who try to explain the former in terms of the latter cannot conceive of the fact that groups formed by individuals, like other organizations of part-units, have properties of their own which remain unintelligible for an observer if his attention is focused on individual people as such and not, at the same time, on the structures and patterns which individuals form with each other.

Those who approach social phenomena, wittingly or not, as if these phenomena existed independently of the individuals by whom they are formed are usually aware of the fact that phenomena of this kind have their irreducible regularities. But expecting as they have been trained to expect, that the regularities of composite units can be deduced from those of their parts and perhaps puzzled by the fact that they cannot deduce the social regularities which they observe simply and clearly from individual regularities, they tend to fall into a manner of speaking and thinking which suggests that social phenomena exist in some sense independently of individual people. They

tend to confuse "having regularities of their own" with "having an existence of their own", in the same way in which the fact that organisms have regularities which cannot be deduced from those of unorganized physical events is often interpreted as a sign that something in organisms has an existence independently of physical events. Here as elsewhere, the inability to think in terms of systems leaves people with the choice between two equally unpalatable alternatives, with the choice between atomistic and hypostatic conceptions.

Some problems cannot be brought nearer solution mainly because one has not sufficient facts to go on, others mainly because, as problems, they are misconceived: General ideas, types of classes, the whole manner of thinking may be malformed or simply inadequate as a result of an uncritical transfer of intellectual models from one context to another. Some of the difficulties encountered in social sciences are of this type. They are due to insufficiencies not so much in the knowledge of facts, as in the basic ideas, categories and attitudes used in making observations of, and in handling, facts. Since people conceived the idea that one might explore not only physical, but also social phenomena, as it were, scientifically, those who tried to do so, have always been, more or less, under the influence of two types of models developed, in different contexts, by two more powerful groups: models of setting and solving problems about social phenomena current in society at large and those of dealing with problems about "nature" developed by natural scientists. It is a question how far either of these two types of models is suited to scientific inquiries into social phenomena. By raising it, one adumbrates the need for re-examination of a wider problem: that of the nature and acquisition of human knowledge generally.

Models of the first type are often used unintentionally by social scientists. They are concerned with phenomena from a sphere of life in which the contingency of unmanageable dangers is continuously high; it is difficult for them to disengage the ideas and concepts they use in their specialized work as scientists from those used day by day in their social life. The hypothetical model used for the study of problems of this kind is a continuum of which one marginal pole is formed by properties of persons and their situation characteristic of complete involvement and complete lack of detachment (such as one might find it in the case of young babies) and the other of properties characteristic of complete detachment and a zero-point of involvement.

Models of the second type, those of natural sciences, are often, though not always, copied deliberately by social scientists; but they do not always examine, at the same time, in what respect these models are consonant with their specific task. Pressed by uncertainties, not unconnected with the strength of their involvements, they are apt to seize upon these models as on ready-made and authoritative means for gaining certainty often enough without distinguishing clearly whether it is certainty about something worth knowing or something rather insignificant which they have gained in this way. As one has seen, it is this mechanical transfer of models from one scientific field to another which often results in a kind of pseudo-detachment,

in a malformation of problems and in severe limitations of topics for research. The hypothetical model used for the study of problems of this kind is a continuum of models of composite units arranged according to the degree of interdependence of part-units. By and large, problems of the physical sciences have as their frame of reference concepts of units with a relatively low degree of organization. Problems referring to units of an equally low degree of organization, e.g. to populations in the statistical sense of the word, are not lacking in the social sciences. But in their case units of this type are always parts of other far more highly organized units. Types of concepts, of explanations and procedures used for inquiries into the former are, at the best, only of limited use in scientific studies of the latter; for in their case, in contrast to that of units of low organization, the knowledge one has gained about properties of isolated parts can only be assessed and interpreted in the light of the knowledge one has gained of properties of the whole unit.

If it is difficult for social scientists to attain greater autonomy of their scientific theories and concepts in relation to public creeds and ideals which they may share, it is not less difficult for them to gain greater autonomy in the development of their scientific models in relation to those of the older, more firmly established and successful physical sciences. The crucial question is whether it is possible to make much headway towards a more detached, more adequate and autonomous manner of thinking about social events in a situation where men in groups, on many levels, constitute grave dangers for each other. Perhaps the most significant insight to be gained from such reflections is the awareness of what has been named here, inadequately enough, the "principle of increasing facilitation": The lower social standards of control in manipulating objects and of detachment and adequacy in thinking about them, the more difficult is it to raise these standards. How far it is possible under present conditions for groups of scientific specialists to raise the standards of autonomy and adequacy in thinking about social events and to impose upon themselves, the discipline of greater detachment, only experience can show. Nor can one know in advance whether or not the menace which human groups on many levels constitute for each other is still too great for them to be able to bear, and to act upon, an over-all picture of themselves which is less coloured by wishes and fears and more consistently formed in cross-fertilization with dispassionate observations of details. And yet how else can one break the hold of the vicious circle in which high affectivity of ideas and low ability to control dangers coming from men to men reinforce our work?