

and controlling the conditions, the influence of one factor on another can be demonstrated with a high level of confidence. Social life, however, is much more complex than natural phenomena and cannot be usefully isolated artificially. In social situations, similar conditions occur only within very limited time periods; history never really repeats itself. Therefore, social conditions can never be precisely repeated and, in any case, in large-scale social experiments, the experimental procedures may artificially eliminate the most important factors and may very well change what is being studied.

3 In the physical sciences (e.g. physics), nothing really new can happen; newness is merely a rearrangement of the elements. In the biological sciences, it is possible for organisms to lose the sense of novelty in experimental situations. Repeating experimental procedures on the same organisms can lead to habitual behaviour; the first application of the procedure changes the possible influence of later applications such that biological newness or novel behaviour can emerge. In other words, organisms learn by experience. However, it is possible to dispose of organisms whose behaviour has been changed by experimental procedures. If societies or social groups are regarded as being like organisms, they too can learn by experience and achieve social newness, but they cannot be disposed of in the same way. This learning becomes part of the group's history.

4 The subject matter of the natural sciences, particularly physics, is much less complicated than the subject matter of the social sciences. Social life presupposes the existence of highly intelligent creatures which have both the capacity and the need for culture. Because they cannot rely on instincts to regulate their activities they have to construct a social world to inhabit, a world of ideas, knowledge, beliefs, values and norms.<sup>4</sup> Therefore, the social sciences face a dual complexity: the impossibility of artificial isolation, and a subject matter that transcends the subject-matters of the natural sciences. Even if social uniformities exist, these complexities may make it impossible to discover them.

5 The theories of the natural sciences are intended to make prediction possible. The form of this prediction (as shall be seen in chapter 5) is that, if certain natural laws apply in a particular circumstance, and certain conditions are met, certain outcomes will follow. However, in the social sciences, a prediction may have an influence on the predicted event. The knowledge of the outcome can change the way people behave, thus producing the possibility of either a self-fulfilling prophecy (Thomas 1928; Merton 1957) or a failed prediction.

6 It follows from the difficulties of making predictions in the social sciences, that there is a complex interaction between the observer and the

<sup>4</sup> Popper's development of this point relied on the more limited notion of human psychology and ignored the socially constructed character of social life. For expositions of this latter view, see Berger (1963), Berger and Luckmann (1966), Luckmann (1967), Schutz (1976) and Schutz and Luckmann (1973).

observed which may threaten objectivity. 'The social scientist may be striving to find the truth; but, at the same time, he [sic] must always be exerting a definite influence upon society. The very fact that his pronouncements *do* exert an influence destroys their objectivity' (Popper 1961: 16). Because the social scientist is a member of the category of phenomenon being studied, disinterested detachment may not be possible. Hence, it might be argued, objectivity and the search for truth is impossible in the social sciences; all social research will be contaminated by the values and interests of the researcher.

7 Whereas the natural sciences can work productively in an atomistic manner by regarding its phenomena as consisting of constellations of parts or elements or factors, a social group must be regarded as more than the mere sum of its members, or the sum of the personal relationships existing at any moment in time. Social groups have traditions, institutions, rituals, in short, culture and history. In order to understand and explain social structures and processes it is necessary to treat social groups holistically.

8 The natural sciences, it is argued, aim at causal explanations; the social sciences can only aim at an understanding of meaning and purpose. Therefore,

[i]n physics events are explained rigorously and quantitatively, and with the aid of mathematical formulae. Sociology tries to understand historical developments in more qualitative terms, for example, in terms of 'national character', or 'spirit of the age'. This is why physics operates with inductive generalisations whereas sociology can only operate with the help of sympathetic imagination. And it is also the reason why physics can arrive at universally valid uniformities, and explain particular events as instances of such uniformities, whereas sociology must be content with the intuitive understanding of unique events, and of the role they play in particular situations, occurring within particular struggles of interests, tendencies, and destinies. (Popper 1961: 20)

9 This use of quantitative analysis and mathematical formulae in the natural sciences is not possible in the social sciences because the concepts found in social theories can only be measured qualitatively, or with a very low level of precision. 'As there is no known way of expressing in quantitative terms the qualities of [social] entities, no quantitative laws can be formulated. Thus, the causal laws of the social sciences, supposing that there are any, must differ widely in character from those of physics, being qualitative rather than quantitative and mathematical' (Popper 1961: 26). This is not to deny that the social sciences may use certain statistical techniques in data analysis, but it is argued that it is not possible to formulate social laws in the precise mathematical terms possible in physics.

This litany of arguments presented by Negativism were not made against social science in general, but were attacks on Naturalism. However, while they are open to debate, they cannot be dismissed lightly. The extent to which they are seen to be a problem depends on the approach to social

enquiry adopted. In varying ways, the approaches to social enquiry attempt to resolve those which are considered to be significant. In so far as Negativists are prepared to accept that some form of social research is possible they will limit it to purely descriptive research; explanation and prediction as advocated by Positivism would be considered to be impossible. In this view, social research can produce descriptions of specific events in language that may have specific meanings, using singular statements that assert nothing beyond that event.

It can be argued that the problem of generalizing explanations throughout time and space is not confined to the social sciences. Comparisons which are made with positional astronomy, for example, neglect the fact that this area of the natural sciences is the exception rather than the rule. Predictions made in the natural sciences, even by means of well-known physical laws, occur only within certain artificial and idealized conditions, such as in a perfect vacuum. 'With the less exact sciences, such as meteorology, prediction is notoriously hazardous, while with living systems (not to say sub-atomic physics) we are seldom dealing with anything better than probabilities' (Richards 1983: 86-87). Whether these sciences will be able to improve their predictive capacity in the future is an open question. However, the influence of culture and history is regarded by the advocates of some approaches as making impossible the kind of predictions claimed by Positivism. But this does not rule out the possibility of social science, it just makes for a different kind of science.

On the problem of using experiments in the social sciences, Popper (1961: 93-97) has contended that the argument rests on a lack of understanding of the experimental method used in physics. Of course, without knowing a great deal about a particular phenomenon, it is difficult to describe what would constitute similar conditions, and what kind and degree of similarity is relevant. Similarly, it may be difficult to establish what degree and type of experimental controls are necessary. These problems are present in both the natural and social sciences and, according to Popper, can only be resolved by experimentation. While the physicist may be in a better position than the social scientist to cope with these problems, either because social phenomena are more complex than natural phenomena, or because physics has a longer history, according to Popper, there is nothing fundamentally different between the two fields in their potential to conduct experiments.

It is worth noting, however, that many areas of the natural sciences, for example, astronomy, have developed without being able to use experimental manipulation, and in some areas of modern science, such as geology and evolutionary biology, there is little scope for it.

Hence those areas of human social enquiry in which opportunities for controlled experiments are rare, cannot be disqualified from the ranks of science on this account alone. In any event there are some areas, notably social psychology, where experiments indistinguishable in design from those of the

natural sciences are routinely performed, while economists make extensive use of idealized models which may be analysed mathematically in much the same way as in physics and physiology. Finally, the 'field investigations', in many social sciences, do not differ in any significant way from those in, say, botany or entomology. (Richards 1983: 86)

It has been argued that the possibility of social researchers allowing their values and prejudices to influence the research process - such as the choice of what is studied, how it is studied, what is regarded as acceptable evidence, how it is collected and how the results are interpreted - makes it difficult to achieve objectivity as understood in Positivism. Whether complete objectivity is possible, or even approachable, is a complex issue which will be taken up later. While such issues may appear to be less serious in the natural sciences, they are nevertheless present. Some of those who believe that value-free social science is not possible have suggested that social scientists should state their values and attitudes as fully and honestly as possible to help others to be aware of possible influences and, hence, how the research results should be interpreted. However, while this may be desirable, it may still be difficult to establish the effects of a social scientist's values and attitudes on the research process and outcomes. Another radical solution has been to abandon the idea of a value-free or objective social science, to treat social phenomena as essentially subjective and to maximize the subjective involvement of the researcher.

It is clear that there are some particular problems which make it difficult to model the social sciences on the natural sciences, but it is also clear that the natural sciences are not without their own problems. Whether the conclusion is that social science is not really possible will depend on how these difficulties are viewed, what responses are made and, more particularly, what kind of social science is considered to be appropriate.

### Historicism

In part, Historicism is a response to some of the problems raised by Negativism about the possibility of social science. The central claim is that as there are fundamental differences between the natural and social sciences, only some of the methods of the natural sciences can be applied in the social sciences. In particular, it is the issue of generalization that is considered to separate the two realms. According to Historicism, historical and cultural relativity makes most of the methods of the natural sciences inapplicable in the social sciences (Popper 1961: 5-6).

In spite of this, Historicism accepts that there are two common elements in the methods of the natural and social sciences. Both methods are theoretical and empirical; they are concerned to explain and predict events through the use of theories, and they rely on observation both to identify these events and to accept or reject any theory. By observing the patterns or trends in the past, Historicism claims that predictions can be made about future trends.

It is the success of fields such as positional astronomy, with its capacity to predict astronomical phenomena such as eclipses and the paths of comets, that has encouraged Historicism to argue that social science can predict future events such as revolutions. It is acknowledged that social predictions may lack the detail and precision of natural science predictions but their vagueness is compensated for by their scope and significance. Historicism is interested in large-scale forecasts, not short-term predictions (Popper 1961: 36–7).

Historicism aims at developing laws of historical development, laws that link up the successive historical periods, laws of process and change rather than uniformities. The experimental method is not appropriate for testing such laws. The observation of future events is the only way to establish the validity of such historical laws; the testing must be left to history. Historicism therefore claims that the discipline of sociology is theoretical history. 'Sociology thus becomes, to the historicist, an attempt to solve the old problem of foretelling the future; not so much the future of the individual as that of groups, and of the human race' (Popper 1961: 42). Thus, while Historicism rejects the capacity of the social sciences to develop universal laws through the use of methods such as the experiment, it claims that through the establishment of laws of historical development it is possible to predict the future course of history.

Popper (1961) has attacked four of the arguments on which Historicism is based: the holistic approach to social theories and social change; the character of historical laws; the variability of experimental conditions; and, the relativity of generalizations. As the last two have been dealt with in the preceding section, only the first two will be discussed here.

As an alternative to Historicism's holistic approach to social theories and social change, Popper adopted what he called 'piecemeal engineering' or a 'piecemeal tinkering' approach to scientific investigation (1961: 67). This is a step by step process used to understand any phenomenon and to avoid unwanted consequences; it involves monitoring what has been achieved against what was expected. It is necessary to avoid conducting experiments or proposing social change of such complexity and scope that it is impossible to understand the processes which are occurring; it may develop in unmanageable or undesirable directions. For this reason, Popper objected to 'utopian engineering' which attempts a complete reconstruction of a society in terms of a set of ideals. He preferred the process of learning by trial and error under conditions in which the errors are manageable.

Popper (1961: 97–104) has argued that while it is possible that a particular theory will be found to be time and place specific, even in the natural sciences, it is an important postulate of the scientific method to search for theories which are general. For,

[i]f we were to admit laws that are themselves subject to change, change could never be explained by laws. It would be the admission that change is

simply miraculous. And it would be the end of scientific progress; for if unexpected observations were made, there would be no need to revise our theories: the *ad hoc* hypothesis that the laws have changed would 'explain' everything. (Popper, 1961: 103)

Popper was critical of the central historicist doctrine regarding the claim that the task of social science is to develop laws of historical development, laws of evolution of society which can be used to foretell its future. He argued that this claim is based on the false notion that evolutionary 'theories' include universal laws. Such propositions, however, are particular historical statements.

[T]he search for the law of the 'unvarying order' in evolution cannot possibly fall within the scope of scientific method, whether in biology or in sociology . . . The evolution of life on earth, or of human society, is a unique historical process. Such a process, we may assume, proceeds in accordance with all kinds of casual laws, for example, the laws of mechanics, of chemistry, of heredity and segregation, of natural selection, etc. Its description, however, is not a law, but only a singular historical statement. Universal laws make assertions concerning some unvarying order . . . But we cannot hope to test a universal hypothesis nor to find a natural law acceptable to science if we are forever confined to the observation of one unique process. Nor can the observation of one unique process help us to foresee its future development. (Popper, 1961: 108–9)

He went on to argue that while history may sometimes repeat itself in certain ways, this does not mean that any apparent repetition or cycle will continue to occur in the future. 'The idea of the movement of society itself – the idea that society, like a physical body, can move as a whole along a certain path, and in a certain direction – is merely a holistic confusion' (Popper, 1961: 114). It is the case that social change may have certain trends or tendencies, but such trends are not universal laws. Trends may persist for hundreds of years but may change at any time in the future. 'There is little doubt that the habit of confusing trends with laws . . . inspired the central doctrines of evolutionism and historicism – the doctrines of the inexorable laws of biological evolution and the irreversible laws of motion of society' (Popper, 1961: 116). Popper objected to the kind of logic that is used to generalize from trends in the past to future states of affairs (see chapter 5).

Popper's attack on Historicism is an attack on Marx's claims that the revolutions throughout recorded history reveal a consistent trend in which oppressors are overthrown by the oppressed. Marx used this trend to predict the outcome of the class struggle in our time, in which the bourgeoisie would be overthrown by the proletariat and, in this case, such struggles would cease and a classless society would be created. In the process, Popper has provided arguments for a different view of science which is referred to here as Critical Rationalism.