



CSS PLATFORM
Realizing The Dream! – Give us a student, we give back a Bureaucrat
SCIENCE AND EDUCATION

Bertrand Russell

Education in the past has been a haphazard and traditional affair, supposed not to begin until the child was at least six years old, and to be concerned almost exclusively with the acquisition of knowledge. It has gradually come to be realized that the earlier years have an enormous importance for the whole of the rest of life, and that the traditional methods developed by uneducated nurses and mothers are by no means the best.

It cannot be said that we know as yet what are the best methods for dealing with very young children. Dr John B. Watson has pointed out the curious fact that, while men of science have studied with great care the behaviour of nearly everything in the world, they have abstained almost with one accord from a scientific study of human infants. For this there have been several reasons: in the first place, most men consider it infra dig. To notice an infant, which, it is thought, should be left to the exclusive care of women; in the second place, hardly any man of science had time to observe his own infants. He can get a grant from a university or other learned body to study the Papuans or the Andaman Islanders, but if he said he wanted to study his own child, he would be laughed at. The observations of nurses and mothers are rendered unreliable by partiality and by the fact that they are seldom trained observers.

Babies are regarded by some as darlings, by others as nuisances, but by practically no one as facts to be impartially studied. Anything that may be said about them at present is, therefore, tentative and provisional. But I think we may expect that in the near future scientific studies, such as those initiated by Dr Watson, will become more frequent. We cannot, however, hope for really valuable results until it has been possible to follow the development of large numbers of young people from birth to the age of twenty, and to obtain such data as will enable us to trace separately the effects of heredity and environment. One could wish that some wealthy scientist would offer a benefaction consisting in giving, in a large number of cases, expensive education in a well-to-do environment to one of two twins born of indigent parents, the twins to be separated as soon as weaned. In this way we might gradually get some data as to heredity, for the similarities between such twins when adult might be fairly regarded as mainly congenital.

Whatever may be thought of psycho-analysis, there is one point in which it is unquestionably in the right, and that is in the enormous stress which it lays upon the emotional life. Given the right emotional development, both character and intelligence ought to develop spontaneously. It is, therefore, to the emotions above all that the scientific educator should direct his attention.

In regard to the emotional life, there are two elements to be considered: on the one hand, the nature of the emotions; on the other hand, the objects toward which they are directed. Take, for example, curiosity; this may take the form of peeping or prying, in which case it must be regarded as undesirable, or it may take the form of a desire for scientific knowledge, in which case it is in the highest degree useful. Or again, take hatred; a man may hate the Government, in which case he is a subversive revolutionary, or he may hate the Reds, in which case he is a pillar of society. The quality of the emotions is the same, but the object is different. The scientific educator has two things to think about: in the first place, he must produce emotions in the right proportions; and in the second place, he must attach them to the right objects. The first is probably, in the last analysis, a matter of chemistry; the second is a matter of 'conditioning' in the sense of Pavlov and Watson. But, although the first may be a matter of chemistry when it

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comes to be adequately understood, it is at the moment much more easily dealt with along the lines studied by psycho-analysis. Moreover, the two departments overlap. A wrong object for an emotion may cause the emotion to increase or decrease unduly, while a new emotion may be cultivated by providing it with a suitable object.

Let us take first the question of the quality of the emotions. One may in a sense divide emotional attitudes into positive and negative; the emotions of hate, rage, and fear are negative, while emotions of affection, pleasure, and experimentation are positive. Speaking broadly, it is a good thing to have much of the positive emotions and little of the negative. There are, of course, exceptions. It is useful to be afraid of snakes, tigers, precipices, and interviewers. But often in such cases fear is not the ideally best reaction; the ideally best reaction is prudence, that is to say, a rational apprehension of danger without the emotion of terror. The more intelligent and rational people become, the less need they have for negative attitudes. A pre-scientific community can, for example, do nothing with criminals except hate, fear, and punish them, whereas a scientific community can study the sources of their criminality, and so attempt reform or prevention of criminal impulses. Or, again, take lightning; fear alone would never have led to the construction of lightning conductors, which depended upon the positive attitude of curiosity.

Science has made life less dangerous than it used to be, and has thus greatly diminished the need of fear as a motive. Education ought from the start to take account of this fact, and to aim at producing the kind of attitude that leads to lightning conductors rather than the kind that leads to cowering terror during a thunderstorm. I am not at the moment concerned with specific fears; these will come under our second heading; I am concerned at the moment with timidity, that is to say, the habit of being frightened easily and by many things.

Timidity depends partly upon physical health: a given child is more timid on a day when his digestion is out of order than on a day when it is functioning properly. But timidity also depends upon various mental causes: a child who is frequently punished or frequently threatened with punishment will become timid; so will, conversely, a child who is always carefully guarded against minor dangers. Muscular activities, as unimpeded as possible, are the best method of producing physical fearlessness in children, while mental fearlessness is the product of unhampered curiosity. Indeed, curiosity is to the mind exactly what muscular activity is to the body. It will be found that mind and body interact in these respects, and that the unimpeded activity which promotes courage also promotes a good digestion, except, of course, in such cases as eating poisonous berries to see whether they are poisonous. (All educational principles have to be applied with common sense.)

Dr Cameron, author of *The Nervous Child*, has lately written a paper¹ in which, although he has hitherto chiefly stressed the psychological causes and cures of nervousness, he points out that the nervous child generally suffers from excessive acidity and can often be greatly helped by the administration of alkalis. This is a good example of the importance of keeping the psychological and chemical aspects of child-welfare equally prominent in our thoughts.

Then again, take rage: both rage and fear, as we know from the work of Cannon, are due to secretion of adrenalin in the blood. Presumably, anything that makes the adrenal gland more active will make people more prone to these emotions, of which the one or the other is felt according to the nature of the external situation. Perhaps we shall learn in time to eliminate both emotions by regulating the action of the adrenal gland or by administering an antidote. But

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in the case of rage also, the psychological causes are for the present easier to ascertain and control than the chemical causes.

The primitive stimulus to rage, as Dr Watson has shown, consists in impediment to the free movement of the limbs. And the habit of rage in later life is generated as a rule by the existence of some irritating obstacle to free activity which is considered to be insurmountable, and, therefore, produces feelings of anger which vent themselves upon other objects. Therefore, so far as is compatible with social good behaviour, it is desirable, if men are to be free from the habit of rage, that they should not have the sense of being impeded in activities toward which they feel powerful impulses. One of the really difficult problems of education is to secure in the young the necessary minimum of good behaviour without producing this attitude of anger at the existence of insurmountable obstacles, but this is a problem of conditioning.

Affectionateness is an emotional habit which is good in moderation, but can easily be carried too far. When carried too far, it involves a lack of self-dependence, which may have very undesirable effects upon character. Some people who are moralists rather than psychologists confound affection with benevolence, and imagine that it consists in a desire for the happiness of the beloved object. This is only very partially the case; in fact, affection in its instinctive manifestations is bound up with jealousy, and is not in all its forms a desirable emotion. A good deal of psychological discrimination is necessary in this matter; no child or adult can develop adequately without affection, but at the same time affection should not play too large a part in life, and great care should be taken to free it from jealousy and from undue dependence upon others. This is a problem which is often very unwisely handled in the home, largely from the mistaken notion that it is impossible for children to be too fond of their parents.

I come now to the question of the object toward which emotions are directed. This is the question of 'conditioning' which has been stressed by the behaviourists. It is undoubtedly very important, but I do not agree with them in thinking that it constitutes practically the whole of education. There are not only good and bad objects for emotions, there are also, speaking broadly, good and bad emotions. The cultivation of good emotions and the elimination of bad ones is not in the main a question of conditioning, which is concerned with the objects to which the emotions are attached. The great work of Pavlov on Conditioned Reflexes has provided a wealth of material on this subject, so far as dogs are concerned, but where human beings are concerned experimentation is much more difficult, although Dr Watson made some valuable investigations on infants in hospitals. Nevertheless, observation affords considerable material which becomes easier to interpret in the light of the experimental data concerning dogs. The hatred of knowledge, which is general among civilized mankind, has by the behaviourists. It is undoubtedly very important, but I do not agree with them in thinking that it constitutes practically the whole of education. There are not only good and bad objects for emotions, there are also, speaking broadly, good and bad emotions. The cultivation of good emotions and the elimination of bad ones is not in the main a question of conditioning, which is concerned with the objects to which the emotions are attached. The great work of Pavlov on Conditioned Reflexes has provided a wealth of material on this subject, so far as dogs are concerned, but where human beings are concerned experimentation is much more difficult, although Dr Watson made some valuable investigations on infants in hospitals. Nevertheless, observation affords considerable material which becomes easier to interpret in the light of the experimental data concerning dogs.

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The hatred of knowledge, which is general among civilized mankind, has been produced by a procedure which was entirely correct from a scientific point of view, namely, the creation of an association between lessons and punishment. The modern educationalist aims at an entirely opposite kind of procedure which was entirely correct from a scientific point of view, namely, the creation of an association between lessons and punishment. The modern educationalist aims at an entirely opposite kind of conditioning. He aims at providing the children with comparatively easy tasks, which can be surmounted with a moderate degree of effort and which appear interesting from the first. By this method learning is associated with the pleasure derived from success, and the efforts which it involves come to be met as cheerfully as the muscular efforts involved in football. In sexual education, to take another matter, the difference between wisdom and unwisdom is almost wholly a question of conditioning.

One of the characteristics of the scientific method is that it is quantitative and aims at discovering the just balance of the different ingredients required to produce a good result, whereas pre-scientific methods consider some things good and some bad without regard to quantity. Take, for example, the question of the quantity of adult attention that is best for a child. In old days most children got less of this than they should have had; nowadays, most children of the well-to-do get more. When such children first come to school they cling to the adults and find it difficult to mix with their contemporaries, toward whom their first reaction is one of hatred and fear. Many of them have been rendered nervous in a greater or less degree by the constant anxiety of parents, and by the effort to understand grown-up conversation.

The modern careful parent has been alarmed by all the dangers to which children are exposed, and has tended to convey to them a certain timidity through the contagion of the unconscious. At the same time, the child has become accustomed to thinking of himself as the centre of the universe and to expecting from the world at large a degree of solicitude which only parents are likely to feel. This is a bad preparation for the world and is best remedied by association with contemporaries. A child is, on the whole, better fighting with other children than being coddled by grown-up people, but the fighting must be kept within limits, and adult supervision is necessary to see that the less vigorous, physically, are not made to suffer.

The spontaneous development of community feeling in a group of children is an interesting study, but it is impossible where adults intervene constantly to promote what they consider social behaviour. A good many years of study and experiment will be necessary before anything very definite can be said on this subject.