

The argument has often been put forward that social science is, strictly speaking, not a science because human behaviour is free and therefore, unpredictable. If actions have a prior cause, the entire length of human existence is linked in a series of causes and effects, and it is difficult to see at what stage in the link does the freedom exist. And yet in our vague judgment a freedom does exist. Two possibilities arise. Firstly, there is no such thing as freedom of human actions and any impression of human freedom is illusory. This is the line of thought that strict determinists have held. Alternatively a freedom may exist, but we are not clear regarding its nature.

Mathematician Laplace said that if all the forces operating within nature were known nothing would be indeterminate. For a mathematician everything within nature is determined because according to him, natural phenomena are governed by equations whose solutions are completely determined. Sciences in general and physical sciences in particular have progressed on the basis of a faith in determinism. Science consists in discovering unalterable laws which govern physical phenomena. Modern physics encountered difficulties in trying to reconcile certain experimental observations and physicists came to the conclusion that natural phenomena are governed by the law of probability and all natural laws may be considered only statistical laws.¹ When we apply statistical laws to any system it means that there are

a large number of individual processes each of which, in turn, is strictly determined. It is only because of the large number involved, or inadequacy of our knowledge of the individual processes involved, we are compelled to apply the law of probability which gives us an approximate idea of what we are likely to witness as a result of the entire set of individually determined processes. Successful application of statistical laws does not exclude determinism but is merely a confession of the inadequacy of our knowledge. What appears too complicated to be called predictable to-day, is not necessarily indeterminate. The simple possibility remains that what is guided by an uncertainty principle to-day, may with increasing refinement become definitely predictable to-morrow. In spite of successful application of statistical laws to natural systems, it would be valid for us to hold that science is primarily based on determination.

In philosophy, there have been protagonists of determinism as well as free will. Descartes and Spinoza have been among the earliest exponents of the determinist school. It is not necessary to go into all the arguments in favour of determinism since it has already considerable support from modern science. Immanuel Kant supported the concept of free will but said that freedom cannot be proved by theoretical reason. According to Kant when one responds to a call of duty, it proves the freedom of our will; for, how could we ever have conceived such a notion

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¹Werner Heisenberg; *The Physicist's Conception of Nature*, London: Hutchinson, 1958, p. 34.

as duty if we had not felt ourselves free? Freedom is proved when we make a moral choice. Other protagonists of free will have largely rested on the desirability of having a concept of free will on ethical grounds. If free will is not accepted, human actions would not be subject to praise or blame. Moral injunctions would be useless and social order would break down.

When one makes a choice, as Kant says, belief in free will is implied; similarly when one says 'I want to do so and so' belief in determinism is implied, since the statement implies an uncertainty of the intention going through on account of stronger forces which may prevail. Thus, if choice indicates human freedom, intention or desire indicates determinism. House of cards of this kind built on wordy logic never leads to concrete advancement of understanding. Evidence in favour of determinism is overwhelming. Hegel puts it admirably when he says that human freedom consists in the recognition of its non-existence.

Although evidence points towards the concept that human actions are determined by prior causes, no one can deny that man is struggling for freedom. What is it that man wishes to be freed from? We often speak of freedom of speech and expression as a very desirable social characteristic. Freedom of speech means that whatever the content of expression, the speaker will not be punished for it. Freedom thus, would mean freedom from fear. Another way of saying the same thing would be that the speaker would not have to be subject to any painful action. Freedom is really freedom from pain and fear. What is true of freedom in respect of expression is generally true of all human actions. Man cannot stop exhaling after inhalation of breath, because breath-holding is painful. Man cannot go without food for any length of time because prolonged starva-

tion is painful. Thus, man is logically bound to adopt the least painful course of action. It is pain and fear which limits freedom. Conversely freedom of action can exist only to the extent there is absence from fear and pain. The key to human freedom lies in the ultimate significance of man's dislike for pain and fear.

The body is protected against external dangers through the sensation of pain which prompts the body to take appropriate remedial measures. Failure to remedy may cause injury or even death. Survival of species and evolutionary progress has been possible because of pain. Any species would have become extinct if painful sensations had appeared welcome to it instead of prompting a desire for avoidance. Even indifference to pain would have had the same effect. That, absence of the ability to feel pain makes survival difficult was seen in the case of the girl Jane at the Washington University Medical School. The little girl was born with a defective capacity for registering pain and she burnt her hand while putting a piece of paper in the fire. Large blisters appeared as she failed to withdraw her hand from the fire because she did not feel anything.

The view that pain is a self-protective mechanism may appear to break down in the case of internal pain. Apart from taking the help of a physician, remedial action is not in the hands of the subject. But hitherto inadequately understood processes may be at work. Blood pressure may be raised and the offending material may be ejected by muscular contraction. Healing may be brought about by increasing blood supply in the affected part or by the forced rest induced by pain. Whether any or all of these factors influence healing, it is not possible to say with certainty. It would be reasonable to suggest, however, that internal pain would

have been eliminated during the course of evolution if it were purposeless. By keeping the whole physiological system alert, internal pain appears to fight the offending cause and brings about a cure by what is known as the natural defence mechanism of the body.

The psychological process does not play any part in the mechanism of pain because even a hypodermic needle pricked by a physician hurts although one is quite sure that the injury is not likely to be serious and indeed, is meant to do him good. Shrinking from pain is entirely instinctive and has no relationship to the process of rational thinking. It is an instinctive defensive reaction to a situation which may injure the body. If the pain is slight, the body is not in serious danger. On the other hand if the pain is agonising, unconsciousness or death may follow. Whether it is a case of extreme form of agony or merely a vague form of uneasiness, basically, both are reactions to unpleasant stimuli, the difference being one of degree only. When the pain is intense, it is the instinctive interpretation of the organism that the body is in mortal peril. Sensation of pain indicates the probability of destruction of the organism. If pain is mild, the possibility of destruction is remote and if intense, breakdown of the physiological system, may be imminent. All unpleasant sensations are basically painful in nature and indicate possibility of death. The degree of pain controls the intensity with which the organism anticipates death.

' It may be argued that a pricking hypodermic needle of a physician does not indicate the approach of death. And yet there would be an instinctive desire to move away from the offending needle. This desire to withdraw from the source of offence means that should the needle be allowed to prick, pain would increase. Withdrawal from any

situation where there is possibility of increase of pain indicates that the process, if unremedied, may ultimately cause death. When the source of offence is external to the organic system, the organism is unable to interpret its behaviour. The organism does not know at what stage pain would stop increasing and therefore has to play for safety. In the case of internal pain the organic system is a wise judge and pain subsides as soon as the difficult period is over. If, however, an unpleasant stimulus does not increase but remains constant, there is gradual adaptation and after a time pain may not be felt any more. The disappearance of a mild feeling of pain under constant stimulus is the interpretation of the physiological system that the danger is not likely to increase and be fatal and therefore, may be left unremedied and tolerated. Pain may, thus, be defined as the instinctive interpretation of an organism of the approach of death. Briefly, pain is anticipation of death.

Fear produces similar reactions in the body as pain. But pain is often localised whereas fear has a -diffuse reaction over the whole system. As a consequence of its diffusion the reaction to fear is not so acutely felt as pain. The question has often been raised as to whether fear is an acquired characteristic or something inherent. Within the first few months of its birth, the infant cries out at loud noises or when he feels himself falling. These reactions are universal and may be assumed to be instinctive and not acquired. Psychologists are not agreed that any other fears are inevitable and universal. However, children readily acquire various kinds of fears as a result of experience. These fears may be different in children brought up under different environmental conditions. But the ability to acquire fears appears fundamental. It apparently arises out of the self-preservative instinct.

Painful situations may be avoided because of past unpleasant experience and thus fear is the result of painful experience. The experience need not be direct or personal but may be acquired indirectly. Fear, then, is anticipation of pain, the avoidance of which is necessary for survival. In "An essay concerning human understanding", John Locke has defined fear thus: "Fear is an uneasiness of the mind, upon the thought of future evil likely to befall us". The word "evil" could more appropriately be replaced by the word "pain". Fear is generally the psychological product of pain and may as well be its antecedent. Briefly, fear is anticipation of pain.

The definitions, then may be summarised as follows:

Pain is anticipation of death.

Fear is anticipation of pain.

Both pain and fear arise from a natural tendency of living beings to continue living and avoid death.

It would be, incidentally, worthwhile to examine the nature of anger which is another reaction to an unpleasant situation. Although both are reactions to noxious stimuli, anger is an aggressive attitude whereas fear is defensive in nature. Thus fear and anger are similar in being reactions to unpleasantness but they are opposite in their expression. The relationship between fear and anger has not been clear and a hitherto unconsidered viewpoint is being presented here.

Two important hormones are secreted by the medulla of the adrenal gland: Adrenaline and nor-adrenaline. Of these, nor-adrenaline is considered to be responsible for aggressive functions such as anger and adrenaline as in fright. This has been concluded from the fact that predators, who attack and fight a

great deal, have a predominance of nor-adrenaline in their adrenal medulla whilst rodents and other plant-eaters who survive by fleeing from predators have a predominance of adrenaline. For example, the lion's adrenal medulla contains 60% nor-adrenaline and 40% adrenaline whereas rabbits and guinea pigs have 85-100% adrenaline. The same ratio holds within a species; the more fearful dogs secrete predominantly adrenaline, the more aggressive dogs predominantly nor-adrenaline.²

The manner in which adrenaline is synthesised within the body is as follows:³

Tyrosine, Dopa, Dopamine, nor-adrenaline, adrenaline.

It will be seen, then, that nor-adrenaline is an intermediate product in the bio-synthesis of the end-product adrenaline. The relative amounts of nor-adrenaline and adrenaline in any animal would depend upon the rate of formation of the end product. If the rate is slow, there will be relative predominance of nor-adrenaline whereas if the rate is rapid, amount of adrenaline would be relatively large. The rate of formation of adrenaline may be so rapid that the transient presence of nor-adrenaline does not record its effect on the physiological system.

Now, we have two aspects for correlation: (1) that nor-adrenaline is responsible for anger and adrenaline for fear; and (2) nor-adrenaline is an intermediate in the bio-synthesis of adrenaline. It is possible to reconcile these two aspects by assuming that basically anger and fear are emotions of a similar kind arising out of an unpleasant stimulus. Depending upon the bio-chemical pre-disposition of the reacting system i.e. depending upon whether the system has a pre-dominance of nor-adrenaline or adrena-

²Magda B., Arnold; *Emotion and Personality*, Vol. II, London: Cassell and Co. Ltd., 1961, p. 225.

³*Adrenergic Mechanisms*, Ciba Foundation Symposium, London: J. and A. Churchill Ltd., 1960.

line, the emotion aroused is anger or fear. In all situations where fear is ultimately aroused, anger, even if transient, must have been an intermediate emotion. By analogy with the chemical reactions, the sequence of psychological effect may be visualised as follows:

Unpleasant stimulus \rightarrow Anger \rightarrow Fear. However, fear may appear directly. In this situation, as has been already explained, the synthesis of adrenaline is so rapid that before conversion into adrenaline, the intermediate product nor-adrenaline may not be available for a sufficiently long period or in sufficient quantity to record its effect on the physiological system. The kinetics of the chain reactions leading to the formation of adrenaline may vary depending upon the quality of the stimulus. Apart from the environmental factor every animal would have an inherent tendency towards a particular adrenaline/nor-adrenaline ratio leading to a particular natural attitude.

An unpleasant situation can be remedied either by destroying the source of offence as in anger (aggression) or running away from it as in fright (avoidance). Speaking in terms of psychology, it appears reasonable that attempting to destroy the source of irritation should appear as the first emotional response. Then the source of offence would be permanently eliminated and there would be no possibility of recurrence of the unpleasantness. Should it appear to the subject, perhaps instinctively, that he is inadequately equipped to meet the situation and the unremedied situation may cause pain (or death), fear would appear and escape would be the only alternative course of action.

Anger arises because certain situation may be disagreeable or painful. The view regarding anger thus presented shows that,

like pain and fear, anger is also a death-prevention mechanism, the only difference being in the manner of meeting the situation. Anger as an emotion, does not require separate treatment because it is an incomplete form of fear.

In a previous paper⁴, the concept has been developed that application of minimum effort is a basic human desire. Social advancement towards greater mechanisation and automation is an evolutionary progress based on this desire. This desire arises from the instinct of self-preservation or the fundamental desire for death prevention. If life is viewed as a specified capacity for energy turnover, desire for death prevention in any organism would prompt it to spend the energy in the slowest possible manner so that life is prolonged to the maximum. According to this view effort contributes to the hastening of death and therefore the desire to be free from effort is also a death preventing mechanism. One makes an effort when one needs to and in this sense also for avoiding painful and fear-inducing consequences. Thus effort may also be considered a form of pain and man's desire to be free from effort also arises from its desire for continued survival.

Freedom is really freedom from unpleasantness. For if something were pleasant man would not wish to be free from it. We have reduced almost all forms of unpleasantness as death preventing mechanisms. Therefore, man's quest for freedom is fundamentally a desire to be free from death—a search for immortality. The desire to be free from death arises from a law of inertia which governs all life. Like the physical law of inertia which tends to maintain unchanged all states of motion, its biological analogue tends to maintain

⁴B. K. Banerji: "Reduction of effort as a progressive social trend" *Indian Journal of Social Work*, October 1964.

unchanged the state of living which, after all, is also a form of motion. Social and scientific advancement has been primarily for prevention of discomfort and reduction of effort. During the course of evolution, this search for freedom from death, which is a law of inertia associated with lift, has made man whatever he is.

Ideally, then, in a free society there would be no pain, fear and anger. Painless and effortless existence would be guaranteed. Individuals would follow their natural

inclinations and use minimum of effort. No one would have to work under threat or compulsion. In essence, in a free society individuals would be subject to no stress at all. The thesis has been developed earlier⁵ that as stress decreases in any society, growth rate of population declines. Gradually, as society approaches the ideal state of freedom, population would keep on decreasing and may ultimately reach the level of extinction. Thus an ideally free society could not exist because approaching freedom would lead to its disappearance.