

**BIOLOGICAL FACT AND
THE STRUCTURE OF
SOCIETY: THE HERBERT
SPENCER LECTURE**

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Biological Fact and the Structure of Society: The Herbert Spencer Lecture by W. Bateson

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UNIV. OF
CALIFORNIA
BIOLOGICAL FACT
AND THE
STRUCTURE OF SOCIETY

THE HERBERT SPENCER LECTURE

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BY

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BIOLOGICAL FACT AND THE STRUCTURE OF SOCIETY

THERE are signs that the civilized world is at length awakening to the fact that the knowledge needed for the right direction of social progress must be gained by biological observation and experiment. Such a turn in public opinion would, we may be sure, have been viewed by Herbert Spencer with exceptional interest and approval. The truth, so obvious to the naturalist, that man is an animal, subject to the same physical laws of development as other animals, is a doctrine he constantly expounded, and perhaps his teaching did more than that of any other philosopher towards helping men to see themselves as they really are, stripped of the sanctity with which superstition and ignorance have through all ages invested the human species.

Spencer not only contributed that great service, but I suppose that no one ever looked forward with serener confidence or a fuller optimism to the consequences which follow upon a recognition of these natural facts, to the possibility of a further evolution of our species, and to the certainty that by his own action the destiny of man may be controlled. It is natural therefore that in a lecture founded to commemorate his work we should examine the possibilities of biological discovery as applied to the constitution and future of human society.

Many causes have combined to give prominence at this moment to the biological aspects of Sociology. There exists a general perception on the part of the more intelligent that the present condition of the social

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structure in civilized states is one of extreme instability. The apprehension that changes of exceptional magnitude are impending is widely spread. In addition to these indefinite sensations of uneasiness, the minds of observant persons are becoming keenly alive to the fact that the unexampled changes in the conditions of human life, made possible by the applications of science, are likely to result in an alteration of the composition of the population. Owing to the control which civilized communities have acquired over the forces of nature the average human life has been materially lengthened, and we need no evidence beyond that of ordinary experience to show that especially have the lives of those who are defective in mind or body been prolonged by application of these new powers on their behalf.

A general acquaintance with the idea of Evolution, in outline at least, has become universal. We are all habituated to the notion that the form of a society, like that of an individual, is a consequence of an evolutionary process. To that process experimental interference on an enormous scale is being applied, and it is inevitable that the community at large should be asking, not without anxiety, how far the outcome of these interferences with what have usually been regarded as natural forces will bring good or evil to the societies which attempt them. Within the last few years, moreover, mankind has suddenly begun to realize what heredity means. The deliberate interferences hitherto contemplated by economists have related to the distribution of wealth and opportunities of many kinds, the regulation of supply and demand, the creation or abolition of divers political institutions, and other measures of similar character. Though the effects of these devices are commonly described as profound, such measures are indirect, and

to the mind of the naturalist most of them are essentially superficial. Every legislative encouragement given to one class and every repression of another has an effect on the future of the race. Exerted over long periods of time, these interferences must indeed influence the composition of a population; but with knowledge of the full meaning of the physiological process of heredity we perceive that man has it in his power to operate upon his species in a much more drastic way. In Spencer's time and long before, this fact was obvious to all who reflected on the matter. He himself in many passages alludes to these possibilities. In 1873, for example, he wrote:¹

'If any one denies that children bear likenesses to their progenitors in character and capacity—if he holds that men whose parents and grandparents were habitual criminals, have tendencies as good as those of men whose parents and grandparents were industrious and upright, he may consistently hold that it matters not from what families in a society the successive generations descend. He may think it just as well if the most active, and capable, and prudent, and conscientious people die without issue; while many children are left by the reckless and dishonest. But whoever does not espouse so insane a proposition must admit that social arrangements which retard the multiplication of the mentally-best, and facilitate the multiplication of the mentally-worst, must be extremely injurious.'

In the period when these words were written practically nothing was known of heredity. Naturalists knew that in general offspring resemble their parents more or less, and that by selection for an indefinite number of generations types could be fixed so as to breed approximately true. That there was a vast province of exact

¹ *The Study of Sociology*, ed. 1908, p. 343.

and readily ascertainable knowledge, fraught with immeasurable practical consequence to mankind, hidden behind the word *heredity* had occurred to scarcely a single mind.

Many were perfectly aware of the importance of heredity. All upholders of evolutionary doctrines, both those who preceded Darwin and those who followed him, were familiar with the fact that change of type came about through the inheritance of modification. In many admirable and striking works the late Francis Galton had endeavoured to direct attention to the practical significance of heredity. He had shown also that the descent of characters could be partially expressed in a system, which, though erroneous in fundamental conception, still gives an approximately correct representation of several of the phenomena.

But the discovery of Mendelian analysis, though as yet imperfectly developed, opens up a new world of physiology. Expressed in the briefest possible way the essence of the Mendelian principle is not difficult to grasp. It may be conveyed in the statement that organisms may be regarded as composed to a great extent of separate factors, by virtue of which they possess their various characters or attributes. These factors are detachable, and may be recombined in various ways. It thus becomes possible to institute a factorial analysis of an individual.

How far such analysis can be carried we do not yet know, but we have the certainty that it extends far, and ample indications that we should probably be right in supposing that it covers most of the features, whether of mind or body, which distinguish the various members of a mixed population like that of which we form a part. From such a representation we pass to the obvious con-

clusion that an individual parent is unable to pass on to offspring a factor which he or she does not possess.

Just as various features or characteristics may be due to the *presence* of the corresponding factor, so we have to recognize that other attributes appear only in the *absence* of certain factors. Moreover, since those individuals only which are possessed of the factors can pass them on to their offspring, so the offspring of those that are destitute of these elements do not acquire them in subsequent generations but continue to perpetuate the type which exists by reason of the deficiency. You will readily understand that in practice the analysis and detection of these factors is a difficult matter. The difficulty arises especially from the very important fact that some of the ingredient-factors have the property of *inhibiting* or masking the effects of other factors, and that many features of bodily organization are due to the *combination* and interaction of two or more ingredients, which alone might be present without producing any perceptible sign of their presence. Thus one flower may be white, because it is lacking in the element which produces colour; but another may be white though it has everything needed to give it colour, because it has in addition an element which suppresses the pigmentation. Again, colour in some plants is due to one factor, but in others it is developed only when two independent complementary factors are present, and either of these may be present alone in a flower which is perfectly white.

Such laws have been demonstrated in operation for an immense diversity of characteristics in both animals and plants in great variety. It should be explicitly stated, however, that in the case of the ordinary attributes of normal men we have as yet unimpeachable evidence