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## The Answer of Biology to Proposed Measures of Eugenics

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# THE LINACRE QUARTERLY

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## THE ANSWER OF BIOLOGY TO PROPOSED MEASURES OF EUGENICS

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THIS is a summary of a very interesting illustrated lecture delivered to the Manhattan Guild at its fall meeting. It is a convincing answer to those eugenicists who are at present displaying an ardent zeal for and an abiding faith in sterilization as a eugenic measure.—EDITOR'S NOTE.

SLIDES were thrown on the screen illustrating the theory of genetics based on the Mendelian law of "segregation" and the inter-play of "dominant" and "recessive" genes. Pictures illustrating the Neo-Mendelian transmission forms of "blending" and "mosaic" arrangement were also shown.

Let me say here that the great body of the defective characteristics that concern us in this discussion are due to "recessive" defective genes, *i.e.*, it requires two of these genes in the same pair to give the individual characteristic, so that a person may have one of such defective genes and be perfectly normal. A person that has defects in both genes of any pair that has to do with the formation of the brain, *e.g.*, will be "feeble-minded" but a person having only one such gene in the pair will be normal or perhaps superior.

The hope of eugenics is based on the possibility of eliminating from the race all the defective genes. Let us grant the eugenicist the most favorable conditions, *viz.*, that all defective characteristics are due to defects in a single pair of genes and that these genes are in the same position in the chromosomes of both parents, and to simplify matters let us take the instance of so-called "feeble-mindedness"; then we can calculate mathematically the result of sterilization of all the feeble-minded persons in a nation. Such calculation has been made by R. A.

Fisher, E. M. East, and R. C. Punnett. (Published in the *Journal of Heredity*, 1917 and 1927.) The result of the computation may be summarized in the words of H. S. Jennings—"if the proportion of feeble-minded in the population is one per thousand, to decrease that proportion to one per ten thousand will require about 68 generations, or two to three thousand years, if it is done merely by stopping the propagation of all feeble-minded individuals" ("Biological Basis of Human Nature"). This meagre result is due to the fact that in each generation the great bulk of the feeble-minded come not from the mating of feeble-minded persons but from the "carriers," *i.e.*, persons who are normal or even superior, but carry in their chromosomes a single defective gene which, when mated with a similar gene from another "carrier," will give rise to a feeble-minded individual. Moreover, these physically well-marked cases of feeble-mindedness which transmit their defective genes by this simple "single pair" method play very little part in the propagation of defectives for the obvious reason that they are prevented from doing so by natural, family, and state influences. In this, at best, very limited group of defectives, with a granted theoretically over-simplified mode of inheritance, the only hope for the eugenicist, then, lies in the possibility of stopping the propagation of the carriers. But we have seen that with our present knowledge there is no way of detecting this group, as they are normal, or even superior, in their phenotypical characteristics.

But there are all grades of feeble-mindedness, and, furthermore, the mental defects may be compensated for by accompanying characteristics either good, such as "ambition," or bad, such as envy, greed, inferiority complexes, etc., so that the individual may succeed in passing as a leading useful citizen. The eugenicist fails to realize that the genes are not dead material bricks in a building, but living units, each reacting with its neighbors, and all reacting together in an organized living totality. From such a group who is to pick out the members due for sterilization? There certainly would be considerable difference of opinion and it is quite possible that so many eugenicists would be elected that the whole eugenic movement would be stopped.

A still heavier blow to eugenics comes from the fact that the great body of defectives that trouble society do not propagate by this simple "same-pair gene defect" method, but by the method of "diverse genes." One outstanding fallacy of the theory of eugenics is the view that each individual characteristic has its corresponding specific gene. The truth is that each individual characteristic, such as the color of the eye, has hundreds and probably thousands of genes contributing to its make-up which are located in different places in the gene map. For example, in the fruit fly, 150 genes located in different positions in the X chromo-

some have been found, any one of which, when defective, will cause a difference in the color of the eye. An illustration of this diverse arrangement of defective genes is shown. Here are two parents, both of whom are feeble-minded, but their defective genes are in different positions, those of the father in the second pair while those of the mother are in the fourth. The children, as you see, are all normal or may be superior, but they are all carriers. I have recently seen a very superior individual whose parents were both typical cases of well-marked feeble-mindedness. The more closely related the parents, the more likely are their defective genes to be in the same pair, and the more distant the relation the more likely are they to be in diverse pairs. The Church has always recognized this fundamental biologic law and has prohibited intermarriage between those of close blood-relationship.

The above-discussed sharply defined pathological traits, *viz.*, feeble-mindedness, insanity, etc., form only a very small part of the social incompatibilities and maladjustments which constitute the difficulties in the way of ideal organization of society. The chief problem has to do with the dependents, the delinquents and all grades of criminals. In his proposed dealings with these, the eugenist exhibits another fundamental biological fallacy, *viz.*, in regarding the inherited genes as independent entities. A gene is not "something that gives rise to a unit characteristic" but "something that in a given environment gives rise to a certain characteristic." The interdependence of gene and environment is similar to that between the positive and negative poles of a magnet. It is only at the extreme ends that genes and environment take on a semblance of independence. In the great majority of cases the genes are "pliable" and result in characteristics which are determined by the environment as much as by their own constitution. And this quality of the genes is fundamental. Emerson found varieties of maize growing in the fields some of which are red and some green. If the red and green are crossed, the inheritance is Mendelian, which shows that the difference is due to genes. But if the red varieties are grown without sunlight, they are green, so the difference is due to environment. Such differences have also been shown to be due to differences in food, temperature, humidity, dryness, etc. An anomaly is shown in the fruit fly, which sometimes arises spontaneously when bred in its natural environment, which includes a moist atmosphere. It breeds true to Mendel's law and, hence, the anomaly is due to defective genes. But breed the fruit fly in a dry atmosphere and they return to normal. Hence the change is due to environment. Many such cases could be enumerated. So it is in the great group of human beings which we are now considering. It is a moral certainty, says Professor Woodruff of Yale, that if the infants Darwin and Lincoln—

which, by the way, were born on the same day—had been exchanged by their mothers, we should not have heard of either of them. In the case of our over-numerous young American criminals we are dealing with a make-up of such “pliable” genes—(young people “easily led”)—which in an environment of poverty with consequent loss of opportunity, bad home surroundings, materialistic education, lack of moral and, above all, of religious training, give rise to all grades of defectives—dependents, delinquents, and all grades of criminals, whereas the same genes in an entirely different, wholesome environment would develop the characteristics of the ideal, model citizen. It seems a fundamental law of human nature that in dealing with such questions there are always men who can see only the extremes—in this case the eugenists at one end and the Watsonian behaviorists at the other. Only in the Aristotelian and scholastic principle of the “happy mean” do we find the solution.

In conclusion, we may say that the ideal of eugenics is a worthy one, but that the measures so far proposed for its accomplishment are impracticable, even when they are not immoral. Even if we could by means of some happy discovery detect all the hidden defective genes in the race, and by some other happy method get rid of them all, we have abundant evidence that they are being manufactured in normal individuals perhaps as fast as we could possibly get rid of them.

Finally, in recent years we see intimations of even more serious difficulty in the way of practical eugenics and this is concerned with the great differences of opinion which may arise not with regard to defective genes but as to the value of the individual characteristics themselves. Just what is the “good” man and who are the “undesirables”? The widespread movement in the world today aimed at uprooting and destroying our established institutions and traditions is only too evident, and to the extent that it succeeds will there be a chaos of opinions on this question. With such uncertainty as to what the ideal is, no radical eugenic measures could be attempted.

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### ALONG HIGHWAY AND BYWAY

**T**HE DRIVE AGAINST CHRISTIAN MORALITY. *Survivals and New Arrivals* is a book by the brilliant Catholic apologist Hilaire Belloc, which appeared in 1929. In its analysis of the present set-up in the attack on Catholicism it says that the new arrivals in the battle-line opposing the Church are all characterized by this note: “they are at issue with the Church not directly on doctrine, as were their elders, but on morals. Morals derive from doctrine, of course, and indirectly the quarrel is doctrinal, as all human conflicts are.”