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EUTHENICS AND EUGENICS

BY DR. C. B. DAVENPORT

COLD SPRING HARBOR, L. I.

OF late years the reading, thinking public has been awakened to a realization that sickness, poverty and crime are great and perhaps growing evils. It does not seem right that there should always be about 3 per cent. of our population on the sick list, that our almshouses should support over 80,000 paupers, not to mention the hundreds of thousands that receive outdoor relief or are barely able to earn a living; and that there should be 80,000 persons in prison. It ought not to be that the nation should have to support half a million insane, feeble-minded, deaf and blind and that a hundred million dollars should be spent annually by institutions in this country for the care of the sick, degenerate, defective and delinquent. It is a hopeful sign of the times that people are asking: "What can we do about it? What is the cause and what the remedy for this state of things?"

The answers to this inquiry take two general trends. One set of reformers urges that the socially unfit are the product of bad conditions and that they will disappear with the establishment of some modern Utopia. The other set of reformers urges that the trouble lies deeper—in the blood—and is the outcome of bad breeding; the trouble will disappear if marriage matings are made more wisely.

The point of view of the first set of reformers may be made clear by some quotations from their works. Thus Henry George, Jr., in his book, "The Menace of Privilege," after stating that there is an increase of insanity, suicides and crime asks: "From what does all this proceed?" and he replied: "Poverty. It means privation . . . insanity, suicide, crime." Mrs. Ellen H. Richards has stated the position of these reformers so well that I am constrained to make numerous quotations from her valuable book entitled "Euthenics"—a name that may well be applied to the point of view that is contrasted with eugenics. She says: "Of all our dangers that of uncleanness leads" (p. 19). "The necessity of judicious, wholesome food is paramount" (p. 22). "Mr. Robert Hunter says: 'Perhaps more than any other condition of life it [food supply] lies at the door of the social and mental inequalities among men'" (p. 23). "A strong, well man, whose work is muscular and carried on in the open air, as is that of the farmer and of the fisherman, will have the power to assimilate almost anything" (p. 24). "Just as soon as the individual fully realizes that he himself is to blame for his suffering or his poverty in human energy, he

will apply his intelligence to the bettering of his condition" (p. 26). "Why are men and women so apathetic over the prevalence of disease? Why do they not devote their energies to stamping it out? For no other reason than their disbelief in the teachings of science, coupled with a lingering superstition that, after all, it is fate, not will power, which rules the destinies of mankind" (p. 28). "There is no greater evil than the congestion of streets and buildings" (p. 48).

In apparent contrast to the euthenics view of the importance of conditions is the eugenics view of the importance of blood. Taking an extreme case, a child is born an imbecile and neither the best of nutrition, the most scrupulous cleanliness, the purest air and sunshine, nor the best of physical and mental training will make anything else out of him. Imbecility can not be cured; in most of its forms it is a necessary result of the nature of the parental mating. It is a defect due to a patent or latent defect in both of the paternal germ plasms. The imbecile is an imbecile for the same reason that a blue-eyed person is blue-eyed.

Lest you have not heard where a blue-eyed child gets its eye color, let me recount the story. Brown eyes are due to a brown pigment laid down in the iris; blue eyes are due to a lack of such pigment. When both parents are brown-eyed the children get the tendency to form iris pigment from both sides of the house, and the condition of the pigment is said to be duplex. If the children get the tendency from one parent only, they still have brown eyes, but the condition is said to be simplex. If both of the parents lack brown eye-pigment, that is proof that the power of producing it is absent from their germ cells. Now, what is absent from the germ cells can not be transmitted, consequently, two parents lacking brown in the iris (blue-eyed) will never have children with brown eyes, but only with blue eyes. If both parents have brown eyes simplex, then one in four of the children will have blue eyes. If one parent has simplex brown eyes and the other has blue eyes, one half of the children will have blue eyes. But, if in both or either one of the parents the brown iris pigmentation is duplex all of the offspring will have brown eyes.¹

TABLE OF MATINGS AND OFFSPRING—EYE COLOR

One Parent	Other Parent	Offspring
PP	PP	PP, PP. All with pigmented iris (brown-eyed).
PP	Pp	PP, Pp. All pigmented, but half simplex.
PP	pp	Pp, Pp. All pigmented and all simplex.
Pp	Pp	PP, Pp, pP, pp. $\frac{1}{4}$ duplex pigmented; $\frac{1}{2}$ simplex; $\frac{1}{4}$ unpigmented (blue-eyed).
Pp	pp	Pp, pp. $\frac{1}{2}$ simplex; $\frac{1}{2}$ unpigmented (blue-eyed).
pp	pp	pp, pp. All unpigmented (blue-eyed).

¹ These different cases of inheritance fall into six groups as in the following table, in which PP stands for duplex pigmentation, Pp for simplex pigmentation and pp for lack of pigmentation.

Now, it will be observed, says the extreme eugenist, that these rules hold no matter whether the children develop in the city or in the country, in moist climate or dry, under conditions of good nutrition or of poor. And what is true of eye color he would maintain is true for skin and hair color, for stature, for abnormal fingers and toes, for diseases of various sorts. Even criminals, like poets and artists, are born and not made. It is not poor conditions that create insanity, but poor blood; not the germ of tuberculosis, but non-resistant protoplasm that causes death from consumption.

Thus the two schools of euthenics and eugenics stand opposed, each viewing the other unkindly. Against eugenics it is urged that it is a fatalistic doctrine and deprives life of the stimulus toward effort. Against euthenics the other side urges that it demands an endless amount of money to patch up conditions in the vain effort to get greater efficiency. Which of the two doctrines is true?

The thoughtful mind must concede that, as is so often the case where doctrines are opposed, each view is partial, incomplete and really false. The truth does not exactly lie between the doctrines; it comprehends them both. What a child becomes is always the resultant of two sets of forces acting from the moment the fertilized egg begins its development—one is the set of internal tendencies and the other is the set of external influences. What the result of an external influence—a particular environmental condition—shall be depends only in part upon the nature of the influence; it depends also upon the internal nature of the reacting protoplasm.

I have two dogs, a fox terrier, and a bird dog. They come upon a wounded bird. The terrier sniffs at it and passes it by, but the retriever picks it up and carries it for a time in its mouth. Is it simply the wounded bird that determines the retriever's action? Clearly no, since the bird did not cause the same response in the terrier. Is it alone the nature of the retriever that determined the carrying; no, since he would not similarly carry a stone. The result is due to the *bird* acting on the peculiar *constitution* of the retriever. So, in general, any human behavior is the resultant of the specific stimulus and the specific nature of the reacting protoplasm. Development is a form of behavior and how a child shall develop physically, mentally and morally is determined not by conditions alone, not by blood alone, but by conditions *and* blood; by the nature of the environment and the nature of the protoplasm.

This principle may be applied generally and it holds true even in diseases. It is an incomplete statement to say that the tubercle bacillus is the cause of tuberculosis, or alcohol the cause of delirium tremens. Experience proves it, for not all drunkards have delirium and not all that harbor the tubercle bacillus die of consumption—else we must all

die of that disease. No, the causes of death as given in the health reports or census bulletins are not the real causes. All of these results are due to an inciting condition acting on a susceptible protoplasm. The real cause of death of any person is his inability to cope with the disease germ or other untoward condition.

The fact that of all occupations of females that of servant shows the highest death rate from consumption does not imply that this occupation is extra-hazardous to the lungs or to body-resistance rather than that servants are largely Irish (who as a nation lack resistance to tuberculosis) or that they are below the average in mental and physical development, including disease resistance.

What is true of consumption is true of various diseases that are commonly thought not to be due to germs, but to conditions of life. Insanity is one of these. Mr. A. goes insane; we explain that it is because of business losses or overwork. But there are a lot of us who have severe losses or who work hard and show no signs of nervous breakdown. It would be more accurate to say A. went insane because his nervous machine was not strong enough to stand the work put upon it. Insanity (except perhaps paresis and the so-called "alcoholic psychoses") rarely occurs except where the protoplasm is defective. Also epilepsy, which is so often ascribed to external conditions, is, like imbecility, determined chiefly by the conditions of the germ plasm; and the trivial circumstance that first reveals the defect is as little the true cause of the defect as the touching of the button that opens an exposition is the motive power of the vast engines.


The variations of density in the geographic distribution of a disease, upon which climatologists lay so much stress, does not always warrant the popular interpretation of the facts. A heavy incidence of disease in any county does not always mean unfavorable environment. I have plotted the distribution of imbeciles received by an institution in a small state. The ratio of incidence of this condition to the entire population is high in some counties (chiefly *rural*) and low in others, due to the presence or absence of foci of the defect. Similarly the varying rate of deaf-mutism is determined by the density of defective germ plasm. So, also, despite its fine climate, the rising generation in California is characterized by diseases of the mucous membranes, because a generation ago much weak protoplasm was attracted to this state as a sanatorium. No, blood is as important a factor in determining the occurrence of disease as climate.

Crime, which the euthenist finds so related to conditions, proves to be, like disease, a resultant of conditions and blood. Only so can we explain the pedigree trees of criminal families like the Jukes and the Zeros. Tactful, firm, sympathetic, just treatment can do much to reform juvenile delinquents, but if the moral sense and balance are

absent the treatment will avail little or nothing. Upon the children of the "Zero" family the priest-school was without effect. The time and pains required for reformation will, in any case, depend on innate qualities of the delinquent.

In respect to talent the importance of both blood and training is generally recognized. Many "lightning calculators" and mathematical prodigies are born and are not at all the product of training, yet training improves the gift for mathematical abstractions. In the realm of vocal and instrumental music the same is true. Even the *prima donna* must be trained. Though the Bach family contained musicians for eight generations, and twenty-nine eminent ones assembled at one family gathering, still training no doubt added to the value of their performances, at the same time that their inborn capacity rendered them apt scholars.

The objection has been raised, as we have seen, to recognizing that heredity has any considerable importance in determining unfavorable results, on the ground that it is a pessimistic and fatalistic doctrine. Euthenics, on the other hand, offers opportunity to do something to improve a person's condition. Apart from the fact that the truth must be faced whether pleasant or not, the contention can not be too strongly urged that improvement of conditions is only palliative, while improvement of blood is essential to permanent progress. Our only hope, indeed, for the real betterment of the human race is in better matings. If any one doubts this let him ask the agriculturalist. Let him ask the Florida orange grower, who no longer fears the frost, if heredity is a "terrible" fact; let him ask the "dry farmer" of Montana, who cultivates his special varieties that require little rain, if heredity gives him the blues; let him ask the breeder of improved Holstein cattle whether he would, if he could, annihilate the fact of transmission of qualities; they would laugh in your face; they would assure you that heredity is their main reliance and their most precious tool. So to the eugenicist heredity stands as the one great hope of the human race; its savior from imbecility, poverty, disease, immorality. But, to be effective, the available salvation must be accepted. By some means or other the principles of eugenics already known, and those which studies now being undertaken will surely reveal, must be applied in marriage selection. To-day, marriage is controlled imperfectly, crudely, by social ideals. Incest, cousin marriages, the marriage of defectives and tuberculous persons, are, in wide circles, taboo. This fact affords the basis for the hope that, when the method of securing strong offspring, even from partially defective stock—and where is the strain without any defect?—is widely known, the teachings of science in respect even to marriage matings will be widely regarded and that in the generations to come the teachings and practise of euthenics will yield the greater result because of the previous practise of the principles of eugenics.



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