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EUGENICS: ITS DEFINITION, SCOPE, AND AIMS.¹

EUGENICS is the science which deals with all influences that improve the inborn qualities of a race; also with those that develop them to the utmost advantage. The improvement of the inborn qualities, or stock, of some one human population will alone be discussed here.

What is meant by improvement? What by the syllable *eu* in "eugenics," whose English equivalent is "good"? There is considerable difference between goodness in the several qualities and in that of the character as a whole. The character depends largely on the *proportion* between qualities, whose balance may be much influenced by education. We must therefore leave morals as far as possible out of the discussion, not entangling ourselves with the almost hopeless difficulties they raise as to whether a character as a whole is good or bad. Moreover, the goodness or badness of character is not absolute, but relative to the current form of civilization. A fable will best explain what is meant. Let the scene be the zoölogical gardens in the quiet hours of the night, and suppose that, as in old fables, the animals are able to converse, and that some very wise creature who had easy access to all the cages, say a philosophic sparrow or rat, was engaged in collecting the opinions of all sorts of animals with a view of elaborating a system of absolute morality. It is needless

¹ Read before the Sociological Society at a meeting in the School of Economics (London University), on May 16, 1904. Professor Karl Pearson, F.R.S., in the chair.

to enlarge on the contrariety of ideals between the beasts that prey and those they prey upon, between those of the animals that have to work hard for their food and the sedentary parasites that cling to their bodies and suck their blood, and so forth. A large number of suffrages in favor of maternal affection would be obtained, but most species of fish would repudiate it, while among the voices of birds would be heard the musical protest of the cuckoo. Though no agreement could be reached as to absolute morality, the essentials of eugenics may be easily defined. All creatures would agree that it was better to be healthy than sick, vigorous than weak, well-fitted than ill-fitted for their part in life; in short, that it was better to be good rather than bad specimens of their kind, whatever that kind might be. So with men. There are a vast number of conflicting ideals, of alternative characters, of incompatible civilizations; but they are wanted to give fulness and interest to life. Society would be very dull if every man resembled the highly estimable Marcus Aurelius or Adam Bede. The aim of eugenics is to represent each class or sect by its best specimens; that done, to leave them to work out their common civilization in their own way.

A considerable list of qualities can easily be compiled that nearly everyone except "cranks" would take into account when picking out the best specimens of his class. It would include health, energy, ability, manliness, and courteous disposition. Recollect that the natural differences between dogs are highly marked in all these respects, and that men are quite as variable by nature as other animals of like species. Special aptitudes would be assessed highly by those who possessed them, as the artistic faculties by artists, fearlessness of inquiry and veracity by scientists, religious absorption by mystics, and so on. There would be self-sacrificers, self-tormentors, and other exceptional idealists; but the representatives of these would be better members of a community than the body of their electors. They would have more of those qualities that are needed in a state—more vigor, more ability, and more consistency of purpose. The community might be trusted to refuse representatives of criminals, and of others whom it rates as undesirable.

Let us for a moment suppose that the practice of eugenics should hereafter raise the average quality of our nation to that of its better moiety at the present day, and consider the gain. The general tone of domestic, social, and political life would be higher. The race as a whole would be less foolish, less frivolous, less excitable, and politically more provident than now. Its demagogues who "played to the gallery" would play to a more sensible gallery than at present. We should be better fitted to fulfil our vast imperial opportunities. Lastly, men of an order of ability which is now very rare would become more frequent, because, the level out of which they rose would itself have risen.

The aim of eugenics is to bring as many influences as can be reasonably employed, to cause the useful classes in the community to contribute *more* than their proportion to the next generation.

The course of procedure that lies within the functions of a learned and active society, such as the sociological may become, would be somewhat as follows:

1. Dissemination of a knowledge of the laws of heredity, so far as they are surely known, and promotion of their further study. Few seem to be aware how greatly the knowledge of what may be termed the *actuarial* side of heredity has advanced in recent years. The *average* closeness of kinship in each degree now admits of exact definition and of being treated mathematically, like birth- and death-rates, and the other topics with which actuaries are concerned.

2. Historical inquiry into the rates with which the various classes of society (classified according to civic usefulness) have contributed to the population at various times, in ancient and modern nations. There is strong reason for believing that national rise and decline is closely connected with this influence. It seems to be the tendency of high civilization to check fertility in the upper classes, through numerous causes, some of which are well known, others are inferred, and others again are wholly obscure. The latter class are apparently analogous to those which bar the fertility of most species of wild animals in zoölogical gardens. Out of the hundreds and thousands of species that

have been tamed, very few indeed are fertile when their liberty is restricted and their struggles for livelihood are abolished; those which are so, and are otherwise useful to man, becoming domesticated. There is perhaps some connection between this obscure action and the disappearance of most savage races when brought into contact with high civilization, though there are other and well-known concomitant causes. But while most barbarous races disappear, some, like the negro, do not. It may therefore be expected that types of our race will be found to exist which can be highly civilized without losing fertility; nay, they may become more fertile under artificial conditions, as is the case with many domestic animals.

3. Systematic collection of facts showing the circumstances under which large and thriving families have most frequently originated; in other words, the *conditions* of eugenics. The definition of a thriving family, that will pass muster for the moment at least, is one in which the children have gained distinctly superior positions to those who were their classmates in early life. Families may be considered "large" that contain not less than three adult male children. It would be no great burden to a society including many members who had eugenics at heart, to initiate and to preserve a large collection of such records for the use of statistical students. The committee charged with the task would have to consider very carefully the form of their circular and the persons intrusted to distribute it. They should ask only for as much useful information as could be easily, and would be readily, supplied by any member of the family appealed to. The point to be ascertained is the *status* of the two parents at the time of their marriage, whence its more or less eugenic character might have been predicted, if the larger knowledge that we now hope to obtain had then existed. Some account would be wanted of their race, profession, and residence; also of their own respective parentages, and of their brothers and sisters. Finally the reasons would be required why the children deserved to be entitled a "thriving" family. This manuscript collection might hereafter develop into a "golden book" of thriving families. The Chinese, whose customs have often much sound sense,

make their honors retrospective. We might learn from them to show that respect to the parents of noteworthy children which the contributors of such valuable assets to the national wealth richly deserve. The act of systematically collecting records of thriving families would have the further advantage of familiarizing the public with the fact that eugenics had at length become a subject of serious scientific study by an energetic society.

4. Influences affecting marriage. The remarks of Lord Bacon in his essay on *Death* may appropriately be quoted here. He says with the view of minimizing its terrors: "There is no passion in the mind of men so weak but it mates and masters the fear of death. . . . Revenge triumphs over death; love slights it; honour aspireth to it; grief flyeth to it; fear pre-occupateth it." Exactly the same kind of considerations apply to marriage. The passion of love seems so overpowering that it may be thought folly to try to direct its course. But plain facts do not confirm this view. Social influences of all kinds have immense power in the end, and they are very various. If unsuitable marriages from the eugenic point of view were banned socially, or even regarded with the unreasonable disfavor which some attach to cousin-marriages, very few would be made. The multitude of marriage restrictions that have proved prohibitive among uncivilized people would require a volume to describe.

5. Persistence in setting forth the national importance of eugenics. There are three stages to be passed through: (1) It must be made familiar as an academic question, until its exact importance has been understood and accepted as a fact. (2) It must be recognized as a subject whose practical development deserves serious consideration. (3) It must be introduced into the national conscience, like a new religion. It has, indeed, strong claims to become an orthodox religious tenet of the future, for eugenics co-operate with the workings of nature by securing that humanity shall be represented by the fittest races. What nature does blindly, slowly, and ruthlessly, man may do providently, quickly, and kindly. As it lies within his power, so it becomes his duty to work in that direction. The improvement of our stock seems to me one of the highest objects that we can

reasonably attempt. We are ignorant of the ultimate destinies of humanity, but feel perfectly sure that it is as noble a work to raise its level, in the sense already explained, as it would be disgraceful to abase it. I see no impossibility in eugenics becoming a religious dogma among mankind, but its details must first be worked out sedulously in the study. Overzeal leading to hasty action would do harm, by holding out expectations of a near golden age, which will certainly be falsified and cause the science to be discredited. The first and main point is to secure the general intellectual acceptance of eugenics as a hopeful and most important study. Then let its principles work into the heart of the nation, which will gradually give practical effect to them in ways that we may not wholly foresee.

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APPENDIX.

WORKS BY THE AUTHOR BEARING ON EUGENICS.

Hereditary Genius (Macmillan), 1869; 2d ed., 1892. See especially from p. 340 in the former edition to the end, and from p. 329 in the latter.

Human Faculty (Macmillan), 1883 (out of print). See especially p. 305 to end.

Natural Inheritance (Macmillan), 1889. This bears on inheritance generally, not particularly on eugenics.

Huxley Lecture of the Anthropological Institute on "The Possible Improvement of the Human Breed under the Existing Conditions of Law and Sentiment," *Nature*, 1901, p. 659; "Smithsonian Report," Washington, 1901, p. 523.

DISCUSSION.

BY PROFESSOR KARL PEARSON.

My position here this afternoon requires possibly some explanation. I am not a member of the Sociological Society, and I must confess myself skeptical as to its power to do effective work. Frankly, I do not believe in groups of men and women who have each and all their allotted daily task creating a new branch of science. I believe it must be done by some one man who by force of knowledge, of method, and of enthusiasm hews out, in rough outline it may be, but decisively, a new block and creates a school to carve out its details. I think you will find on inquiry that this is the history of each great branch of science. The initiative has been given by some one great thinker—a Descartes, a Newton, a Virchow, a Darwin, or a Pasteur. A sociological society, until we have found a great sociologist, is a herd without a leader—there is no authority to set bounds to your science or to prescribe its functions.¹ This, you must realize, is the view of that poor creature, the doubting man, *in media vitæ*; it is a view which cannot stand for a moment against the youthful energy of your secretary, or the

¹ [The claims of Comte and Spencer to have jointly performed for sociology the preliminary service of architectonic initiation—for which Professor Karl Pearson looks to the future—were discussed in the paper laid before the society at the June meeting by Professor Durkheim and Mr. Branford (*vide* p. 134 of this number of the JOURNAL.—EDITORS.)

boyish hopefulness of Mr. Galton, who mentally is about half my age. Hence for a time I am carried away by their enthusiasm, and appear where I never anticipated being seen — in the chair at a meeting of the Sociological Society. If this society thrives, and lives to do yeoman work in science — which, skeptic as I am, I sincerely hope it may do — then I believe its members in the distant future will look back on this occasion as perhaps the one of greatest historical interest in its babyhood. To those of us who have worked in fields adjacent to Mr. Galton's, he appears to us as something more than the discoverer of a new method of inquiry; we feel for him something more than we may do for the distinguished scientists in whose laboratories we have chanced to work. There is an indescribable atmosphere which spreads from him and which must influence all those who have come within reach of it. We realize it in his perpetual youth; in the instinct with which he reaches a great truth, where many of us plod on, groping through endless analysis; in his absolute unselfishness; and in his continual receptivity for new ideas. I have often wondered if Mr. Galton ever quarreled with anybody. And to the mind of one who is ever in controversy, it is one of the miracles associated with Mr. Galton that I know of no controversy, scientific or literary, in which he has been engaged. Those who look up to him, as we do, as to a master and scientific leader, feel for him as did the scholars for the grammarian:

“Our low life was the level's, and the night's;
He's for the morning.”

It seems to me that it is precisely in this spirit that he attacks the gravest problem which lies before the Caucasian races “in the morning.” Are we to make the whole doctrine of descent, of inheritance, and of selection of the fitter, part of our everyday life, of our social customs, and of conduct? It is the question of the study now, but tomorrow it will be the question of the marketplace, of morality, and of politics. If I wanted to know how to put a saddle on a camel's back without chafing him, I should go to Francis Galton; if I wanted to know how to manage the women of a treacherous African tribe, I should go to Francis Galton; if I wanted an instrument for measuring a snail, or an arc of latitude, I should appeal to Francis Galton; if I wanted advice on any mechanical, or any geographical, or any sociological problem, I should consult Francis Galton. In all these matters, and many others, I feel confident he would throw light on my difficulties, and I am firmly convinced that, with his eternal youth, his elasticity of mind, and his keen insight, he can aid us in seeking an answer to one of the most vital of our national problems: How is the next generation of Englishmen to be mentally and physically equal to the past generation which has provided us with the great Victorian statesmen, writers, and men of science — most of whom are now no more — but which has not entirely ceased to be as long as we can see Francis Galton in the flesh?

BY DR. MAUDSLEY.

The subject is difficult, not only from the complexity of the matter, but also from the subtleties of the forces that we have to deal with. In considering the question of hereditary influences, as I have done for some long period of my life, one met with the difficulty, which must have occurred to everyone here, that in any family of which you take cognizance you may find one member, a son, like his mother or father, or like a mixture of the two, or more like his mother, or that he harks back to some distant ancestor; and then again you will find one not in the least like father or mother or any relatives, so far as you know. There is a variation, or whatever you may call it, of which in our present knowledge you cannot give the least explanation. Take, as a supreme instance, Shakespeare. He was born of parents not distinguished from their neighbors. He had five brothers living, one of whom came to London and acted with him at Blackfriars' Theater, and afterward died. Yet, while Shakespeare rose to the extraordinary eminence that he did, none of his brothers distinguished themselves in any way. And so it is in other families. From my long experience as a physician I could give instances in every department — in science, in literature, in art — in which one member of the family has risen to extraordinary prominence, almost genius perhaps, and another has suffered from mental disorder.

Now, how can we account for these facts on any of the known data on which we have at present to rely? In my opinion, we shall have to go far deeper down than we have been able to go by any present means of observation—to the corpuscles, atoms, electrons, or whatever else there may be; and we shall find these subjected to subtle influences of mind and body during their formations and combinations, of which we hardly realize the importance. I believe that in these potent factors the solution of the problem may be found why one member of a family rises above others, and others do not rise above the ordinary level, but perhaps sink below it. To me it seems, when I consider this matter in regard to these difficulties, that in making a comparison with the improvement of breeding of animal stock we may be apt to be misled. We are all organic machines, so to speak; at the same time, when we come to the human being there are complexities which arise from the mental state and its moods and passions which entirely disturb our conclusions, which we should be able to form in regard to the comparatively simple machines which animals are.

In view of these difficulties of the subject, it has always seemed to me that we must not be hasty in coming to conclusions and laying down any rules for the breeding of humans and the development of a eugenic conscience. In fact, we must be on our guard against the overzeal, which Dr. Galton has very properly cautioned us against. For, after all, there is the passion of love and the forces referred to in his quotation from Bacon; and I am not sure but that nature, in its own blind impulsive way, does not manage things better than we can by any light of reason, or by any rules which we can at present lay down. I am inclined to think that, as in the past, so in the future, it may be, as Shakespeare said:

“You may as well try to kindle snow by fire”

As quench the fire of love by words.”

BY DR. MERCIER.

Mr. Galton speaks of the laws of heredity, and dissemination of a knowledge of the laws of heredity in so far as we know them, and the qualification is very necessary. For, in so far as we know the laws, they are so obscure and complex that to us they work out as chance. We cannot detect any practical difference in the working of the laws of heredity and the way in which dice may be taken out of a lucky bag. It is quite impossible to predict from the constitution of the parents what the constitution of the offspring is going to be, even in the remotest degree. I lay that down as emphatically as I can, and I think that much widely prevailing erroneous doctrine on this head is due to the writings of Zola. I believe these writings are founded on a totally false conception as to what the laws of heredity are, and as to how they work out in the human race. He supposes that, since the parents have certain mental and moral peculiarities, the children will reproduce them with variations. It is not so. Look around among your acquaintance; look around among the people that you know; notice the intellectual and moral character of the parents and children; and, as my distinguished predecessor, Dr. Maudsley, has said, you will find that in the same family there are antithetic extremes. It is doubtful if moral traits are hereditary.

Then there is the tendency of a high civilization to reduce the fertility of its worthier members. It does seem as if there were some such tendency. Undoubtedly, in any particular race of organisms, as in organisms in general, the lower order multiplies more freely than the highly organized. Undoubtedly, we see that insects and bacteria increase and multiply exceedingly until they become as the sands on the seashore. But the elephant produces only once in thirty years. And so it is with human beings of different grades of organization. Undoubtedly, those more highly organized are less fertile than those lowly organized. But that is not the whole history of the thing. I think we have to regard a civilized community somewhat in the light of a lamp burning away at the top, replenished from the bottom. It is true that the highest strata waste and do not reproduce themselves; and it is of necessity so, because the production of very high types of human nature is always sporadic. It never occurs in races; it always occurs in individual cases.

I know I am speaking heresy in the presence of Dr. Galton. Some of these doctrines I am enunciating ought to be qualified. But, broadly and generally, and in practice, it is so, that we cannot predict from the parentage what the offspring is going to be, and we cannot go back from the offspring and say what the parentage was. If we follow the custom of the Chinese and ennoble the parents for the achievements of their children, are we to hang the parents when the offspring commit murder?

And, finally, I would say one word about suitable and unsuitable marriages. Most of what I have to say has already been said by Dr. Galton. What are suitable and unsuitable marriages? How are we to decide? In the light of our knowledge—I had better say ignorance, I think—he would be a very bold man who would undertake the duties that were intrusted to the family council among those wise and virtuous people of whom Dean Swift has given us a description, and who should determine who should be the father and who the mother, and make marriages without consulting the individuals most concerned. I think, if that were done, it is doubtful if the result would be any better than it is at present.

BY PROFESSOR WELDON.

There are two sets of objections which have been used against the points made by Dr. Galton: One set criticises the statistical method on the ground that it cannot account for a number of phenomena. In the presence of the author of the *Grammar of Science*, I venture to say it is no proper part of statistics to account for anything, but it is the triumph of statistics that it can describe, and with a very fair degree of accuracy, a large number of phenomena. And, as I conceive the matter, the essential object of eugenics is not to put forward any theory of causation of hereditary phenomena; it is to diffuse the knowledge of what these phenomena really are. We may not be able to account for the formation of a Shakespeare, but we may be able to tabulate a scheme of inheritance which will indicate with very fair accuracy, the percentage of cases in which children of exceptional ability result from a particular type of marriage. If we can do that alone, we shall have made a very great advance in knowledge. And my view of Mr. Galton's object is that he wishes to point out to us the way in which that knowledge may be attained. Well, that is the answer I would give to all objections to the statistical method, based on its inability to account for phenomena. It ought not to try to account for them, but to describe them. If Dr. Mercier would consult the studies on inheritance that result from Mr. Galton's labor, he would find that they describe distribution of character in the children of parents of particular kinds in regard to a very large number of characters, mental and physical. You, yourself, Mr. Chairman, have given such a comprehensive summary of those results, most of them achieved in your own laboratory, that I need not trouble this meeting by saying any more about them.

Then there is another class of objectors, whose attitude is summarized in the most interesting series of remarks by Mr. Bateson. Because a large number of apparently simple results have been attained in experimental breeding establishments, and especially by the Austrian abbot, Gregory Mendel, it has been too lightly assumed that these phenomena have henceforward superseded the actuarial method, and that the only reliable method is experiment on simple characters, such as those initiated by Mr. Mendel and carried out by Mr. Bateson in England, in Holland by Professor Defries, and by an increasing number of men all over Europe. But the statistical method is itself necessary in order to test the results of the experiments which are supposed to supersede it. The question whether there is really an agreement between experience and hypothesis is in nearly every case hard to answer, and can be achieved only by the use of this actuarial method which Mr. Galton has taught us to apply to biological problems.

The second answer to objections of that type seems to me to be this, that while it is perfectly true that by sound actuarial methods you may deduce a justifiable result, yet from a laboratory experiment you have not arrived at the formulation of a eugenic maxim. You must look at your facts in their relation to

an enormous mass of other matter, and in order to do that you must treat large masses of your race in successive generations, and you must see whether the behavior of these large masses is such as you would expect from your limited experiment. If the two things agree, you have realized as much of the truth as would serve as a basis for generalization. But if you find there is a contradiction resulting from the facts—from the large masses and limited laboratory experiments—then there is no doubt whatever that, from the point of view of human eugenics, and from the theory of evolution, the more important data are those from the larger series of material; the less important are those from laboratory experiment.

BY MR. H. G. WELLS.

We can do nothing but congratulate ourselves upon the presence of one of the great founders of sociology here today, and upon the admirable address he has given us. If there is any quality of that paper more than another upon which I would especially congratulate Dr. Galton and ourselves, it is upon its living and contemporary tone. One does not feel that it is the utterance of one who has retired from active participation in life, but of one who remains in contact with and contributing to the main current of thought. One remarks that ever since his Huxley Lecture in 1901, Dr. Galton has expanded and improved his propositions.

This is particularly the case in regard to his recognition of different *types* in the community, and of the need of a separate system of breeding in relation to each type. The Huxley Lecture had no recognition of that, and its admission does most profoundly modify the whole of this question of eugenics. So long as the consideration of types is not raised, the eugenic proposition is very simple: superior persons must mate with superior persons, inferior persons must not have offspring at all, and the only thing needful is some test that will infallibly detect superiority. Dr. Galton has resorted in the past to the device of inquiring how many judges and bishops and such-like eminent persons a family can boast; but that test has not gone without challenge in various quarters. Dr. Galton's inquiries in this direction in the past have always seemed to me to ignore the consideration of social advantage, of what Americans call the "pull" that follows any striking success. The fact that the sons and nephews of a distinguished judge or great scientific man are themselves eminent judges or successful scientific men may after all, be far more due to a special knowledge of the channels of professional advancement than to any distinctive family gift. I must confess that much of Dr. Galton's classical work in this direction seems to me to be premature. I have been impressed by the idea—and even now I remain under the sway of the idea—that our analysis of human faculties is entirely inadequate for the purpose of tracing hereditary influence. I think we want a much more elaborate analysis to give us the elements of heredity—an analysis of which we have at present only the first beginnings in the valuable work of the Abbé Loisy that Mr. Bateson has recently revived.

Even the generous recognition of types that Dr. Galton has now made does not altogether satisfy my inquiring mind. I believe there still remain further depths of concession for him. At the risk of being called a "crank," I must object that even that considerable list of qualities Dr. Galton tells us that everyone would take into account does not altogether satisfy me. Take health, for example. Are there not types of health? The mating of two quite healthy persons may result in disease. I am told it does so in the case of the interbreeding of healthy white men and healthy black women about the Tanganyika region; the half-breed children are ugly, sickly, and rarely live. On the other hand, two not very healthy persons may have mutually corrective qualities, and may beget sound offspring. Then what right have we to assume that energy and ability are simply qualities? I am not even satisfied by the suggestion Dr. Galton seems to make that criminals should not breed. I am inclined to believe that a large proportion of our present-day criminals are the brightest and boldest members of families living under impossible conditions, and that in many desirable qualities the average criminal is above the average of the law-abiding

poor and probably of the average respectable person. Many eminent criminals appear to me to be persons superior in many respects — in intelligence, initiative, originality — to the average judge. I will confess I have never known either.

Let me suggest that Dr. Galton's concession to the fact that there are differences of type to consider is only the beginning of a very big descent of concession, that may finally carry him very deep indeed. Eugenics, which is really only a new word for the popular American term "stirpiculture," seems to me to be a term that is not without its misleading implications. It has in it something of that same lack of a fine appreciation of facts that enabled Herbert Spencer to coin those two most unfortunate terms, "evolution" and "the survival of the fittest." The implication is that the *best* reproduces and survives. Now really it is the *better* that survives, and not the *best*. The real fact of the case is that in the all-around result the inferior usually perish, and the average of the species rises, but not that any exceptionally favorable variations get together and reproduce. I believe that now and always the conscious selection of the best for reproduction will be impossible; that to propose it is to display a fundamental misunderstanding of what individuality implies. The way of nature has always been to slay the hindmost, and there is still no other way, unless we can prevent those who would become the hindmost being born. It is in the sterilization of failures, and not in the selection of successes for breeding, that the possibility of an improvement of the human stock lies.

BY DR. ROBERT HUTCHISON.

My only claim to address a meeting on this subject is that not only, in common with all physicians, am I acquainted with the factors that make for physical deterioration, but I have devoted special attention to certain factors which I believe play a large part in the production of human types. I refer to feeding. I believe we have, in treating this subject, to consider two lines in which a society like this might work. It has to consider, first, the raw material of the race — and that I believe to be the view which commends itself especially to Dr. Galton — and, second, the conditions under which that raw material grows up. I believe, speaking as a physician, and judging from the raw material one sees, for example, in the children's hospitals, that it is not so necessary to improve the raw material, which is not so very bad after all, as it is to improve the environment in which the raw material is brought up. ¶ Of all the factors in that environment, that which is of the greatest importance in promoting bad physical and bad mental development is, I believe, the food factor. ¶ If you would give me a free hand in feeding, during infancy and from ten to eighteen years of age, the raw material that is being produced, I would guarantee to give you quite a satisfactory race as the result. And I think we should do more wisely in concentrating our attention on things such as those, than in losing ourselves in a mass of scientific questions relating to heredity, about which, it must be admitted, in regard to the human race, we are still profoundly in ignorance.

BY DR. WARNER.

When I had the pleasure of reading the proof of Mr. Galton's paper, I devoted what time I could to thinking carefully over what might be expected to be the practical outcome of what I had understood from that paper, if I had read it aright. And a careful reading of Mr. Galton's paper shows that he purposely deals with only a portion of the means of developing a good nation, and that portion is marriage selection. I also gather that the tendency of the paper is to advocate the marriage between those who are most highly evolved in their respective families. But there is a point in this connection which I think is apt to be overlooked, and that is the examples we have of dangers from intermarriage between highly evolved members of two families. A considerable number of degenerates come under my observation and come to me professionally. They are mostly children; and, as far as possible, I get what knowledge I can of their families both on the paternal and the maternal side. It happens in a very considerable proportion that the father and mother are the best of the families from

which they themselves have proceeded. Where a man has evolved from a humble class to a high form of mental work, and his life has attracted the feeling or affection of a lady who has evolved rather higher mental faculties than the rest of her family, there is danger. It happens very often that the parents of degenerate children are the best of their respective families. I do not go into any details, but I could give you a string of cases, straight off, to show how frequent it is among the families of men who have risen, that the first of all, if he is a male, is feeble-minded, or degenerate. There is also the great question of the girls, as well as the boys, in their personal evolution. It has been constantly said that one reason why apparently the girls' capacity is less than the boys' capacity for many sorts of work is that their mothers have not been educated. Now, I should like to ask Mr. Galton whether the girls inherit through the mother or through the father. For myself, I extremely doubt the general view.

BY MR. ELDERTON.

An important item in the study of heredity is the heredity of disease; and, if so, life-insurance offices might be of use with certain statistics. Certificates of death are given to them which are put away with the original proposal papers, filled up when the insurance was taken out, which state the cause of death of parents, brothers, and sisters, and their ages at death; also their ages when the person effected the insurance, if they were still living. Locked up in that sort of information are many data for the study of heredity in relation to disease. From this source also might be thrown light on a question of great importance—the correlation between specific diseases and fertility.

One point in conclusion: Dr. Hutchison spoke of the greater importance of environment, but in that he would hardly get actuaries to agree with him. Their observation, based on life-insurance data, would seem to show that environment operates as a mere modificatory factor after heredity has done its work.

BY BENJAMIN KIDD.

It is, I am sure, a peculiar satisfaction to have from Mr. Galton this important and interesting paper. No man of science in England has done more to encourage the study of human faculty by exact methods, and I hope the Sociological Society will endeavor to follow the example he has set us. The only item of criticism I would offer would be to say that we must not, perhaps, be sanguine in expecting too much at present from eugenics founded on statistical and actuarial methods in the study of society. We must have a real science of society before the science of eugenics can hope to gain authority. The point of Mr. Galton's paper is, I think, that, however we may differ as to other standards, we are, at all events, all agreed as to what constitutes the fittest and most perfect individual. I am not quite convinced of this. Much obscurity at present exists in sociological studies from confusing two entirely different things, namely, individual efficiency and social efficiency. Mr. Galton's fable of the animals will help me to make my meaning clear. It will be observed that he has considered the animals as individuals. If, however, we took a social type like the social insects, a contradiction which, I think, possibly underlies his example, might be visible. For instance, it is well known that all the qualities of the bees are devoted to attaining the highest possible efficiency of their societies. Yet these qualities are by no means the qualities which we would consider as contributing to a perfect individual. If the bees at some earlier stage of evolution understood eugenics, as we now understand the subject, what peculiar condemnation, for instance, would they have visited on the queen bee, who devotes her life solely to breeding? I am afraid, too, that the interesting habits of the drones would have received special condemnation from the unctuous rectitude of the time. What would have been thought even of the workers as perfect individuals with their undeveloped bodies and aborted instincts? And yet all these things have contributed in a high degree to social efficiency, and have undoubtedly made the type a winning one in evolution.

The example will apply to human society. Statistical and actuarial methods

alone in the study of individual faculty often carry us to very incomplete conclusions, if not corrected by larger and more scientific conceptions of the social good. I remember our chairman, in his earlier social essays, once depicted an ideally perfect state of society. I have a distinct recollection of my own sense of relief that my birth had occurred in the earlier ages of comparative barbarism. For Mr. Pearson, I think, proposed to give the kind of people who now scribble on our railway carriages no more than a short shrift and the nearest lamp-post. I hope we shall not seriously carry this spirit into eugenics. It might renew, in the name of science, tyrannies that it took long ages of social evolution to emerge from. Judging from what one sometimes reads, many of our ardent reformers would often be willing to put us into lethal chambers, if our minds and bodies did not conform to certain standards. We are apt to forget in these matters that that sense of responsibility to life which distinguishes the higher societies is itself an asset painfully acquired by the race—a social asset of such importance that the more immediate gain aimed at would count by the side of it as no more than dust in the balance. Our methods of knowledge are as yet admittedly very imperfect. Mr. Galton himself, I remember, as the result of his earlier researches into human faculty, put the intellectual caliber of what are called the lower races many degrees below that of the European races. I ventured to point out some years ago that this assumption appeared to be premature, and the data upon which it was founded insufficient. So much is now generally admitted. Yet it would have been awkward had we proceeded to draw any large practical conclusion from it at the time. The deficiency of what have been called the lower races is now seen to be, not so much an intellectual deficiency, as a deficiency in social qualities and social history, and therefore in social inheritance.

Many examples of a similar kind might be given. It may be remembered, for instance, how a generation or two ago Malthusianism was urged upon us in the name of science and almost with the zeal of a religion. We have lived to see the opposite view now beginning to be urged with much the same zeal and emphasis. A nation or a race cannot afford to make practical mistakes on a large scale in these matters.

I trust and believe that much that Mr. Galton anticipates will be realized. But I think we must go slowly with our science of eugenics, and that we must take care, above all things, that it advances with, and does not precede, a real science of our social evolution. We must come to the work in a humble spirit. Even the highest representatives of the various social sciences must realize that in the specialized study of sociology as a whole they are scarcely more than distinguished amateurs. Otherwise, in few other departments of study would there be so much danger of incomplete knowledge, and even of downright quackery, clothing itself with the mantle and authority of science.

BY MRS. DR. DRYSDALE VICKERY.

The speech which has interested me most is that of Dr. Hutchison. Important as is the quality of hereditary stock, yet at the present juncture I would say that of still greater importance is this, that we have such a vast number of our population growing up under bad conditions. The result is an artificial, a merely economic, multiplication of inferior stocks. The question I wish to raise is this: Are we producing, in this country and in all civilized countries, a greater proportion of new individuals than can be favorably absorbed? In a country like Russia the surplus of births over deaths amounts to two millions in the year; in Germany the surplus is a million; in Britain, not quite half a million. Can we, in an old state of society, absorb that amount of new individuals and give them fair conditions of existence? I think not.

Dr. Warner spoke of the importance of our teaching of girls. I hold very strongly that the question of heredity, as we study it at present, is very much a question of masculine heredity only, and that heredity with feminine aspects is very much left out of account. Mr. Galton told us that a certain number of burgesses' names had absolutely disappeared; but what about the names of their wives, and how would that consideration affect his conclusion? In the future, the question of population will, I hope, be considered very much from the

feminine point of view; and if we wish to produce a well-developed race, we must treat our womankind a little better than we do at present. We must give them something more like the natural position which they should hold in society. Women's specialized powers must be utilized for the intellectual advancement of the race.

BY LADY WELBY.

The science of eugenics as not only dealing with "all influences that improve the inborn qualities of a race," but also "with those that develop them to the utmost advantage," must have the most pressing interest for women. And one of the first things to do—pending regulative reform—is to prepare the minds of women to take a truer view of their dominant natural impulse toward service and self-sacrifice. They need to realize more clearly the significance of their mission to conceive, to develop, to cherish, and to train—in short, in all senses to mother—the next and through that the succeeding generations of man.

As things are they have almost entirely missed the very point both of their special function and of their strongest yearnings. They have lost that discerning guidance of eugenic instinct and that innerrancy of eugenic preference which, broadly speaking, in both sexes have given us the highest types of man yet developed. The refined and educated woman of this day is brought up to countenance, *and to see moral and religious authority countenance*, social standards which practically take no account of the destinies and the welfare of the race. It is thus hardly wonderful that she should be failing more and more to fulfil her true mission, should indeed too often be unfaithful to it, spending her instinct of devotion in unworthy, or at least barren, directions. Yet, once she realizes what the results will be that she can help to bring about, she will be even more ready than the man to give herself, not for that vague empty abstraction, the "future," but for the coming generations among which her own descendants may be reckoned. For her natural devotion to her babe—the representative of the generations yet to come—is even more complete than that of her husband, which indeed is biologically, though she knows it not, her recognition in him of the means to a supreme end.

But it is not only thus that women are concerned with the profound obligation to the race which the founder of the science of eugenics is bringing home to the social conscience. At present, anyhow, a large proportion of civilized women find themselves from one or another cause debarred from this social service in the direct sense.

There is another kind of race-motherhood open to, and calling for the intelligent recognition and intelligent fulfilment by, all women. There are kinds of natural and instinctive knowledge of the highest value which the artificial social conditions of civilization tend to efface. There are powers of swift insight and penetration—powers also of unerring judgment—which are actually atrophied by the ease and safety secured in highly organized communities. These, indeed, are often found in humble forms, which might be called in-sense and fore-sense.

While I would lay stress on the common heritage of humanity which gives the man a certain motherhood and the woman a certain fatherhood in outlook, perhaps also in intellectual function, we are here mainly concerned with the specialized mental activities of women as distinguished from those of men. It has long been a commonplace that women have, as a rule, a larger share of so-called "intuition" than men. But the reasons for this, its true nature and its true work and worth, have never, so far as I know, been brought forward. It is obvious that these reasons cannot be properly dealt with—indeed, can but barely be indicated—in these few words. They involve a reference to all the facts which anthropology, archæology, history, psychology, and physiology, as well as philology, have so far brought to our knowledge. They mean a review of these facts in a new light—that which, in many cases, the woman who has preserved or recovered her earlier, more primitive racial prerogative can alone throw upon them.

I will only here mention such facts as the part primitively borne by women

in the evolution of crafts and arts, including the important one of healing; and point out the absolute necessity, since an original parity of muscular development in the animal world was lost, of their meeting physical coercion by the help of keen, penetrative, resourceful wits, and the "conning" which (from the temptation of weakness to serve by deception) became what we now mean by "cunning." To these I think we may add the woman's leading part in the evolution of language. While her husband was the "man of action," and in the heat of the chase and of battle, or the labor of building huts, making stockades, weapons, etc., the "man of few words," she was necessarily the talker, necessarily the provider or suggester of symbolic sounds, and with them of pictorial signs, by which to describe the ever-growing products of human energy, intelligence, and constructiveness, and the ever-growing needs and interests of the race; in short, the ever-widening range of social experience.

We are all, men and women, apt to be satisfied now — as we have just been told, for instance, in the Faraday Lecture — with things as they are. But that is just what we all came into the world to be dissatisfied with. And while it may now be said that women are more conservative than men, they still tend to be more adaptive. If the fear of losing by violent change what has been gained for the children were removed, women would be found, as of old, in the van of all social advance.

Lastly I would ask attention to the fact that throughout history, and I believe in every part of the world, we find the elderly woman credited with wisdom and acting as the trusted adviser of the man. It is only in very recent times and in highly artificial societies that we have begun to describe the dense, even the imbecile, man as an "old woman." Here we have a notable evidence indeed of the disastrous atrophy of the intellectual heritage of woman, of the partial paralysis of that racial motherhood out of which she naturally speaks! Of course, as in all such cases, the inherited wisdom became associated with magic and wonder-working and sybilline gifts of all kinds. The always shrewd and often really originaive, predictive, and wide-reaching qualities of the woman's mind (especially after the climacteric had been passed) were mistaken for the uncanny and devil-derived powers of the sorceress and the witch. Like the thinker, the moralist, and the healer, she was tempted to have recourse to the short-cut of the "black arts," and appeal to the supernatural and miraculous, as science would now define these. We still see, alas, that the special insight and intelligence of women tends to spend itself at best on such absurd misrepresentations of her own instincts and powers as "Christian Science," or worse, on clairvoyance and fortune-telling and the like. Then, it may be, elaborate theories of personality — mostly wide of the mark, and constructed upon phenomena which we could learn to analyze and interpret on strictly scientific and really philosophical principles, and thus to utilize at every point. We are, in short, failing to enlist for true social service a natural reserve of intelligence which mostly lying unrecognized and unused in any healthy form, forces its way out in morbid ones. And let us here remember that we are not merely considering a question of sex. No mental function is entirely unrepresented on either side.

The question then arises: How is civilized man to avail himself fully of this reserve of power? The provisional answer seems to be: By making the most of it through the training of all girls for the resumption of a lost power of race-motherhood which shall make for their own happiness and well-being, in using these for the benefit of humanity; in short, by making the most of it through truer methods in education than any which have yet, except in rare cases, been applied. Certainly until we do this many social problems of the highest importance will needlessly continue to baffle and defeat us.

BY MR. HOBHOUSE.

I feel a good deal of difficulty in intervening in this extremely interesting discussion at this stage. I, like many of you, am only a listener to what the biologists have to tell us in this matter. Until we have very definite information as to what heredity can do, I think those of us who are only students of

sociology, and who cannot lay any claim whatever to be biologists, ought to keep silence. We have this afternoon had extremely divergent views put before us as to the actual and probable operation of heredity, and it seems quite clear that before we begin to tackle this question, which deals with one of the most powerful of human passions, with a view to regulate it, we must have highly perfected knowledge. We must have the chart properly mapped out before we do anything that might lead us into greater danger than we at present incur.

As to the two factors, stock and environment, no one can doubt that both are of fundamental importance in relation to the welfare of society; and no one can doubt that, if the kind of precise knowledge which I desiderate could be laid before us by the biologist, it would have considerable influence on our views of what is not only ethically right, but what could be legislatively enforced. Of these two factors, stock and environment, which can we modify with the greater ease and certainty of not doing harm? It is fairly obvious that we can affect the environment of mankind in certain definite ways. We have the accumulation of considerable tradition as to the way a given act will affect the social environment. When we come to bring stock into consideration, we are still dealing with that which is very largely unknown. At the same time, we owe a great deal of thanks to Mr. Galton for raising this subject. On the one hand, it seems to me that the bare conception of a conscious selection as a way in which educated society would deal with stock is infinitely higher than natural selection with which biologists have confronted every proposal of sociology. If we are to take the problem of stock into consideration at all, it ought to be in the way of intelligently handling the blind forces of nature. But until we have far more knowledge and agreement as to criteria of conscious selection, I fear we cannot, as sociologists, expect to do much for our society on these lines.

BY G. A. ARCHDALL REID, M.D.

I think it would be impossible to imagine a subject of greater importance, or to name one of which the public is more ignorant. At the root of every moral and social question lies the problem of heredity. Until a knowledge of the laws of heredity is more widely diffused, the public will grope in the dark in its endeavors to solve many pressing difficulties.

How shall we bring about a "wide dissemination of a knowledge of the laws of heredity, so far as they are surely known, and the promotion of their further study"? We shall not be able to reach the public until we are able to influence the education of a body of men whose studies naturally bring them into relation with the subject, and who, when united, are numerous enough and powerful enough to sway public opinion. Only one such body of men exists—the medical profession. When the study of heredity forms as regular a part of the medical curriculum as anatomy and physiology, then, and not till then, will the laws of heredity be brought to bear on the solution of social problems. At present a specialist like Mr. Galton has a very limited audience. In effect, it is composed of specialists like himself. Until among medical men a systematic knowledge of heredity is substituted for a bundle of prejudices, and close and clear reasoning for wild guesswork, the influence of men of Mr. Galton's type most unhappily is not likely to extend much beyond the limits of a few learned societies.

The first essential is a clear grasp of the distinction which exists between what are known as inborn traits and what are known as acquired traits. Inborn traits are those with which the individual is "born," which come to him by nature, which form his natural inheritance from his parents. Acquired traits are alterations produced in inborn traits by influences to which they are exposed during the life of the individual. Thus a man's limbs are inborn traits, but the changes produced in his limbs by exercise, injury, and so forth are acquired traits. All men know that the individual tends to transmit his inborn traits to his offspring. But it is now almost universally denied by students of heredity that he tends to transmit his acquired traits. The real, the burning question among students of heredity is whether changes in an individual caused by the

action of the environment on him tend *in any way* to affect the offspring subsequently born to him. Thus, for example, does good health in an individual tend to benefit his offspring? Does his ill-health tend to enfeeble them?

It is generally assumed that changes in the parents do tend to influence the inborn traits of offspring. Thus we have heard much of the degeneracy which it is alleged is befalling our race owing to the bad hygienic conditions under which it dwells in our great growing cities. The assumption is made that the race is being so injured by the bad conditions that the descendant of a line of slum-dwellers, if removed during infancy to the country, would, on the average, be inferior physically to the descendant of a line of rustics; whereas, contrariwise, the descendant of a line of rustics, if removed during infancy to the slums would be superior physically to the majority of the children he would meet there.

I believe this assumption to be a totally unwarrantable one. It is founded on a confusion between inborn and acquired traits. Of course, the influences which act on a slum-bred child tend to injure him personally. But there is no certain evidence that the descendant of a line of slum-dwellers is on the average inferior to the descendant of a line of rustics whose parents migrated to the slums just after his birth. I believe in fact, that while a life in the slums deteriorates the individual, it does not affect *directly* the hereditary tendencies of the race in the least. A vast mass of evidence may be adduced in support of this contention. Slums are not a creation of yesterday. They have existed in many countries from very ancient times. Races that have been most exposed to slum life cannot be shown to be inferior physically and mentally to those that have been less or not at all exposed. The Chinese, for example, who have been more exposed, and for a longer time, to such influences than any other people, are physically and mentally a very fine race, and certainly not inferior to the Dyaks of Borneo, for example.

There is also a mass of collateral evidence. Thus Africans and other races have been literally soaked in the extremely virulent and abundant poison of malaria for thousands of years. We know how greatly malaria damages the individual. But Africans have not deteriorated. Like the Chinese, physically, at any rate, they are a very fine race. Practically speaking, every negro child suffers from malaria, and may perish of it. But while the *sufferings* of the negroes from malaria have produced no effect on the race, the deaths of negroes from malaria have produced an immense effect. The continual weeding out, during many generations, of the unfittest has rendered the race pre-eminently resistant to malaria; so that negroes can now flourish in countries which we, who have suffered very little from malaria, find it impossible to colonize. Similarly, the inhabitants of northern Europe have suffered greatly for thousands of years from consumption, especially in places where the population has been dense—where there have been many cities and towns, and therefore slums. They also have not deteriorated; they have merely grown pre-eminently strong against consumption. They are able to live, for example, in English cities, in which consumption is very rife, and which individuals of races which have been less exposed to the disease find as dangerous as Englishmen find the west coast of Africa.

During the last four hundred years consumption has spread very widely, and now no race is able to dwell in cities and towns, especially in cold and temperate climates, that has not undergone evolution against it. In other words, no race is capable of civilization that has not undergone evolution against consumption, as well as against other diseases and influences, deteriorating to the individual, which civilization brings in its train. Many biologists and most medical men believe that influences acting on parents tend directly to alter the hereditary tendencies of offspring. In technical terms, they believe that variations are caused by action of the environment. How they contrive to do so in the face of the massive and conclusive evidence afforded by the natural history of human races in relation to disease is beyond my comprehension. How *could* a race undergo evolution against malaria (for example), if parental disease altered and injured the hereditary tendencies of the offspring. How could natural selection select, if all the variations presented for selection were unfavorable. The observations on

disease and injury published by Brown-Séquard, Cossar Ewart, and many medical men are capable of an interpretation different to that which they have given.

Mr. Galton speaks as if the causes which have brought about the disappearance of most savage races when brought in contact with high civilization were obscure. I can assure him, however, that they have been worked out precisely and statistically by many medical observers on the spot. Apart from extermination by war, the only savage races which are disappearing are those of the New World, and in every instance they are perishing from the enormous mortality caused among them by introduced diseases against which their races have undergone no evolution. He will find these precise statistics in the tables of mortality issued by all the public health departments that exist in America, Polynesia, and Australasia. He will find also many accounts in the journals of travelers. If he will read the records of visits of parties of aborigines from the New World to the cities of Europe, he will find that their mortality, especially from consumption, was invariably high. There is nothing more mysterious about the disappearance of these races than there is about the disappearance of the dodo and the bison. They are perishing, not because, as Froude poetically puts it, they are like "caged eagles," incapable of domestication, but simply and solely because they are weak against certain diseases. If malaria instead of consumption were prevalent in cities, the English would be incapable of civilization, whereas the negroes and the wild tribes about the Amazon, and in New Guinea and Borneo, would be particularly capable of it. Indeed, it may be taken as a general rule, to which there is no exception, that every race throughout the world is resistant to every disease precisely in proportion to its past experience of it, and that only those races are capable of civilization which are resistant to the diseases of dense populations.

Before the voyage of Columbus, hardly a zymotic disease, with the exception of malaria, was known in the New World. The inhabitants of the Old World had slowly evolved against the diseases of civilized life under gradually worsening conditions, caused by the gradual increase of population, and therefore of disease. They introduced these maladies to the natives of the New World under the worst conditions then known. They built cities and towns, the natural breeding-places of all zymotic diseases, except those of the malarial type. They gave the natives clothes, which are the best vehicle for the transport of microbes. They endeavored to Christianize and civilize the natives, and so drew them into buildings where they were infected. They forced them to labor on plantations and in mines. In fact, they forced on them every facility for "catching" disease. As a result, they exterminated or almost exterminated them. The natives of the Gilbert Islands lately petitioned our government not to permit missionaries to settle among them, as they feared destruction. They were perfectly right. Clothes and churches and schoolrooms are fatal to such people. The Tasmanians, before they were quite exterminated, had a saying that good people—that is, people who went frequently to church—died young. They also were perfectly right—that is, as regards their own race.

It is a highly significant fact that, whereas every white man's city in Asia or Africa has its native quarter, no white man's city in the New World has a native quarter. To find the pure aborigines of the New World we must go to parts remote from cities and towns. They cannot accomplish in a few generations an evolution which the natives of the Old World accomplished only after hundreds, perhaps thousands, of generations, and at the cost of millions of lives. The negroes, who were introduced into America to fill the void created by the disappearing aborigines, have perhaps persisted, but they had already undergone some evolution against consumption—the chief disease of civilization—and much evolution against measles and other diseases. Yet even the negroes would not have persisted had they not been introduced under special conditions. They were taken to the warmer parts of America at a time when consumption was little rife as compared to its prevalence in the cities of Europe, and they were employed mainly in agricultural occupations. They had a special start, and were placed under conditions that worsened only slowly. As a result they underwent evolution, and are now able to persist in America. But African negroes,

as compared to the natives of the densely populated parts of Europe and Asia, have undergone little evolution against consumption. As a consequence, no African colony has ever succeeded in Europe or Asia. For instance, the Dutch and English imported about twelve thousand negroes into Ceylon a century ago. Within twenty years all had perished, mainly of consumption, and that in a country where the disease is not nearly so prevalent as in northern Europe, or the more settled parts of northern Asia.

There can be little doubt that the sterility of the New World races when brought into contact with civilization is due mainly to ill-health. The sterility of our upper classes is mainly voluntary. It is due to the possession of special knowledge. The growing sterility of the lower classes is due to the spread of that knowledge; hence the general and continuous fall in the birth-rate. Until we are able to estimate the part played by this knowledge it would be vain to collect statistics of comparative sterility.

We have frequently been told that no city family can persist for four generations unless fortified by country blood. That, I believe, is a complete error. Country blood does not strengthen city blood. It weakens it, for country blood has been less thoroughly purged of weak elements. It is true, owing to the large mortality in cities and the great immigration from the country, it is difficult to find a city family which has had no infusion of country blood for four generations. But to suppose on that account that country blood strengthens city blood against the special conditions of city life is to confuse *post hoc* with *propter hoc*.

Slum life and the other evil influences of civilization, including bad and insufficient food, vitiated air, and zymotic diseases, injure the individual. They make him acquire a bad set of traits. But they do not injure the hereditary tendencies of the race. Had they done so, civilization would have been impossible. Civilized man would have become extinct. On the contrary, by weeding out the unfittest, they make the race strong against those influences.

If, then, we wish to raise the standard of our race, we must do it in two ways. In the first place, we must improve the conditions under which the individual develops, and so make him a finer animal. In the second place, we must endeavor to restrict, as much as possible, the marriage of the physically and mentally unfit. In other words, we must attend both to the acquired characters and to inborn characters. By merely improving the conditions under which people live we shall improve the individual, but not the race. The same measures will not achieve both objects. Medical men have done a good deal for the improvement of the acquired characters of the individual by improving sanitation. They have attempted nothing toward the second object, the improvement of the inborn traits of the race. Nor will they attempt anything until they have acquired a precise knowledge of heredity from biologists. On the other hand, before biologists are able to influence medical men they must bring to bear their exact methods of thought on the great changes produced in various races by their experience, during thousands of years, of disease. I am sure our knowledge of heredity will gain in precision and breadth by a consideration of these tremendous, long-continued, and drastic experiments conducted by nature. No experiments conducted by man can compare with them in magnitude and completeness. And, as I have already intimated, the precise statistical information on which our conclusions may be based is already collected and tabulated. I am quite sure it is good neither for medicine nor biology that medical men and biologists should live as it were in separate and closed compartments, each body ignoring the splendid mass of data collected by the other. Much of medicine should be a part of biology, and much of biology a part of medicine.

BY W. LESLIE MACKENZIE, M.A., M.D.

It is to me a great privilege to be permitted to say something in any discussion where Dr. Francis Galton is leader; because from early in my student days until now I have felt that his method of handling sociological facts has always been at once scientific and practical. Whether the ideas he represents have had some subconscious effect in driving me into the public-health service,

I cannot tell; but since I entered that service fourteen years ago, I have been in a multitude of minor ways impressed with two things: first, that in every Scottish community, rural and urban, a hygienic renaissance is in progress; second, that in the many forms it assumes, it has no explicit basis in scientific theory. In attempting, some time ago, to penetrate to the root-idea of the public-health movement, I concluded that, rightly or wrongly, we have all taken for granted certain postulates. The hygienic renaissance is the objective side of a movement whose ethical basis is the set effort after a richer, cleaner, intenser, life in a highly organized society. The postulates of hygienics—whose administrative form constitutes the public-health service—are such as these: that society or the social group is essentially organic; that the social organism, being as yet but little integrated, is capable of rapid and easy modification, that is, of variations secured by selection; that disease is a name for certain maladaptations of the social organism or of its organic units; that diseases are thus, in greater or lesser degrees, preventable; that the prevention of disease promotes social evolution; that, by the organization of representative agencies—county councils, town councils, district councils, parish councils, and the like—the processes of natural selection may be indefinitely aided by artificial selections; that thus, by continuous modification of social organism, of its organic units, and of the compound environment of both, it is possible to further the production of better citizens—more energetic, more alert, more versatile, more individuated. Provisionally, public health may be defined as the systematic application of scientific ideas to the extirpation of diseases and thereby to the direct or indirect establishment of beneficial variations both in the social organism and in its organic units. In more concrete form, it is an organized effort of the collective social energy to heighten the physiological normal of civilized living.

A science of hygienics might thus be regarded as almost equivalent to the science of eugenics; character is presupposed in both. The fundamental assumption of hygienics is that the human organism is capable of greater things than on the average it has anywhere shown, and that its potentialities can be elicited by the systematic improvement of the environment. From the practical side, hygienics aims at "preparing a place" for the highest average of faculty to develop in.

Take heredity—one of Dr. Galton's points. The modern movement for the extirpation of tubercular phthisis began with the definite proof that the disease is due to a bacillus. But the movement did not become world-wide until the belief in the heredity of tuberculosis had been sapped. So long as the tubercular person was weighted by the superstition that tubercular parents must necessarily produce tubercular children, and that the parents of tubercular children must themselves have been tubercular, he had little motive to seek for cure, the fatalism being here supported by the alleged inheritance of disease. Now that he knows how to resist the invasion of a germ, he is proceeding in his multitudes to fortify himself. What is true of tuberculosis is true of many other infections. Consequently, every hygienist will agree with Dr. Galton that the dissemination of a true theory of heredity is of the first practical importance. Nor is the evil of a wrong theory of heredity confined to infectious disease. If the official "nomenclature of diseases" be carefully scrutinized, it will be found that the vast majority of diseases are due either to the attacks of infective or parasitic organisms, or to the functional stress of environment, which for this purpose is better named "nurture." This has recently been borne in upon me by the examination of school children. The conclusion inevitably arising out of the facts is that inherited capacities are in every class of society so masked by the effects of nurture, good or bad, that we have as yet no means of determining, in any individual case, how much is due to inheritance and how much to nurture. There is here an unlimited field for detailed study.

Next, fertility. It is, I suppose, on the whole, true that the less opulent classes are more fertile than the more opulent. But I am not prepared to accept the assumption that the economically "upper classes" coincide with the biologically "upper classes." May it not be that the relatively infertile "upper classes" (economical) are only the biological limit of the "lower classes," from

which the "upper" are continually recruited? Until the economically "lower classes" are analyzed in such detail as will enable us to eliminate what is due to bad environment, we cannot come to final conclusions on the relative fertility or infertility of "upper" or "lower." Until such an analysis is made, we cannot well assume that the difference in fertility is in any degree due to fundamental *biological* differences or modifications. Dr. Noël Paton has recently shown that starved mothers produce starved offspring and that well-fed mothers produce well-fed offspring. In his particular experiment with guinea pigs the *numbers* of offspring were unaffected. If this experiment should be verified on the large scale, it would form some ground for doubting whether the mere increase of comfort directly produces biological infertility. The capacity to reproduce may remain; but reproduction may be limited by a different ethic. The universal fall in the birth-rate has been too rapid to justify *simpliciter* the conclusion that biological capacity has altered.

When the public-health organizations have succeeded in extirpating the grosser evils of environment, they will, it is hoped, proceed to deal more intimately with the individual. In the present movement for the medical examination and supervision of school children we have an indication of great developments. If to the relatively coarse methods of practical hygienics we could now add the precision of anthropometry, we should find ready to hand in the schools an unlimited quantity of raw material. We might even hope to add some pages to the "golden book" of "thriving families." Incidentally, one might suggest a minor inquiry: Of the large thriving families, do the older or the middle or the younger members show, on the average, the greater ultimate capacity for civic life? My impression is that, in our present social conditions, the middle children are likely to show the highest percentage of total capacity. This is a mere impression, but it is worth putting to the test of facts.

To the worker in the fighting line, as the public-health officer must always regard himself, Dr. Galton's suggestions come with inspiration and light.

BY G. BERNARD SHAW.

I agree with the paper, and go so far as to say that there is now no reasonable excuse for refusing to face the fact that nothing but a eugenic religion can save our civilization from the fate that has overtaken all previous civilizations.

It is worth pointing out that we never hesitate to carry out the negative side of eugenics with considerable zest, both on the scaffold and on the battlefield. We have never deliberately called a human being into existence for the sake of civilization; but we have wiped out millions. We kill a Tibetan regardless of expense, and in defiance of our religion, to clear the way to Lhasa for the Englishman; but we take no really scientific steps to secure that the Englishman when he gets there, will be able to live up to our assumption of his superiority.

It is quite true, as the lecturer suggests, that the violent personal preferences on which most plays and novels are founded are practically negligible forces in society. They can be, and are, circumscribed by political and social institutions as successfully as the equally violent antipathies which lead to murder. In spite of all the romancers, men and women are amazingly indiscriminate and promiscuous in their attachments: they select their wives and husbands far less carefully than they select their cashiers and cooks. In the countries where they are not allowed to select at all, but have their marriages arranged for them wholly by their parents, the average result seems to be much the same as that of our own more promiscuous plan of letting people marry according to their fancies. In short, for all sociological purposes, it may safely be assumed that people are not particular as to whom they marry, provided they do not lose caste by the alliance. But we must not infer from this that they will tolerate any interference with their domestic life once they are married. Political marriages are perfectly practicable as far as the church door; but once the register is signed there is an end of all public considerations. If the selection is eugenically erroneous, there is no remedy. If it is so brilliantly successful that it seems a national loss to limit the husband's progenitive capacity to the breeding capacity of one woman, or the

wife's to an experiment with one father only, our marriage customs and prejudices will stand as sternly in the way as if no selection had been exercised at all in the first instance. Eugenics under such limitations lose their interest and relapse into mere Platonic speculation.

I am afraid we must make up our minds either to face a considerable shock to vulgar opinion in this matter or to let eugenics alone. Christianity began by attacking marriage; and though the attack utterly failed, the Catholic church still regards the marriage of a priest as an abomination. Luther would never have dared to marry a nun if his opinions on the question had not gone much farther than any Protestant community now dares to hint. But a merely negative attitude toward marriage is foredoomed to failure. Celibacy is so clearly an impossibilist doctrine that even St. Paul could not press it to its logical conclusion. Luther's views are anarchic, and suggest mere profligacy to the ordinary Philistine. Now, marriage is profligate enough in all conscience; but it is not anarchic. Consequently marriage holds its own in spite of the revulsions of the higher sexual conscience against the open claim of married people to be exempt from all social obligation and even self-respect in their relations with one another. And as this very licentiousness serves the all-important purpose of keeping the race recruited, it has never been possible to challenge it seriously until the popularization, about thirty-five years ago, of the sterilization of marriage. This practice had, for decency's sake, to justify itself as a eugenic one: it was said that when there were fewer children each child would receive more care and nourishment, and have a better chance of surviving to maturity. But a mere reduction in the severity of the struggle for existence is no substitute for positive steps for the improvement of such a deplorable piece of work as man. We may even allow, without countenancing for a moment the crudities of neo-Darwinism, that it may conceivably do more harm than good. What we must fight for is freedom to breed the race without being hampered by the mass of irrelevant conditions implied in the institution of marriage. If our morality is attacked, we can carry the war into the enemy's country by reminding the public that the real objection to breeding by marriage is that marriage places no restraint on debauchery as long as it is monogamic, whereas eugenic breeding would effectually protect the mothers and fathers of the race from any abuse of their relations. As to the domestic and sympathetic function of marriage, or even its selfishly sexual function, we need not interfere with that. What we need is freedom for people who have never seen each other before, and never intend to see one another again, to produce children under certain definite public conditions, without loss of honor. That freedom once secured, and the conditions defined, we have nothing further to say in the matter until the necessarily distant time when the results of our alternative method of recruiting will be able to take the matter in hand themselves, and invite the world to reconsider its institutions in the light of experiments, which must, of course, in the meantime run concurrently with the promiscuity of ordinary marriage.

BY JOHN M. ROBERTSON.

1. A difficulty at once arises on the proposition that "the aim of eugenics is that each *class or sect* should be *represented by its best specimens*." What does this mean? Apparently (judging from the context) that the *average* of each recognizable *type* should be raised, that those who are *now* "best" should be the standard for the future averages. If that be the idea, the formula had better run simply: "The aim of eugenics is to promote such calculation or choice in marriage as shall maximize the number of efficient individuals." There will always be *some* "best," and it is a contradiction in terms to say that they "represent their class."

2. It seems, again, an oversight to make a multiplication of "*large and thriving families*" the ostensible ideal. If *all* families were "*large*," they certainly could not all be "*thriving*." A great increase of population would make thriving a harder matter; the struggle would be intensified on new lines. Further, "*thriving*" is often a matter of the possession of unsocial or antisocial

qualities — unscrupulousness and acquisitiveness — and a vulgar idea of achievement. Given a family of morally and intellectually superior types, all contented with simple conditions, and averse to commercial struggle, are they to be classed as ill-born, or failures? If, finally, it should be shown that a common condition of thriving for large or other families is the possession of capital for a start in business, we are brought to no conclusion in eugenics, but set asking for one in terms of politics.

3. It is, indeed, highly important to set up such common standards as shall preclude replication of morbid stocks, including in these those seen to tend to insanity, dumbness, suicide, dipsomania, erotism, violence, etc. Mr. Galton's past work has done much to bring the importance of heredity home to thinking people. But there is a danger of seeming to ask too much. For one thing, we must not overlook the fact that mere high physical stamina is not necessarily, or even very probably, a condition of high brain power. Merely "delicate" people, therefore, are not to be warned off marriage. Many great men (*e. g.*, Newton and Voltaire) were extremely fragile in infancy. Some (*e. g.*, Calvin, Pope, Spencer, Heine, Stevenson) were chronic invalids. For another thing, though it seems clear that high capacity in one parent is often neutralized by the lack of it in the other, it is vain to think to eliminate the factor of love or instinctive preference in marriage.

4. It seems impossible, finally, to separate eugenics from politics, inasmuch as the bad physical and moral conditions set up by poverty — *i. e.*, ill-feeding, ill-housing, ill-clothing, and early prolificacy on the one hand, and ignorance in child-rearing and begetting on the other — are the great forces of "kakogenics." Mr. Galton says: "There is strong reason for believing that the rise and decline of nations is closely connected with" the rate of reproduction in the "upper" or other classes. I respectfully suggest that an effect is here put for a cause. The true causation of the rise and decline of nations, surely, is proximately a general economic process, depending primarily on physical environment (that is, natural resources), and secondarily on political direction, which is conditioned by political environment. That is to say, Rome did not rise through the fecundity or fall through the infecundity of her ruling or other classes. In the early period they were normally fecund. In the period of empire they appear to have become infecund as a result of the bad relation to life set up by their imperialistic economics. But mere fecundity on their part would not have made that economics healthy, or rectified their relation to life. Saracen society has often presented fecund aristocracies, without any arrest of social decline. The depopulation of imperial Italy and of post-Alexandrian Greece, on the other hand, was not a physiological, but an economic, process. The Greeks went to the new and more facile economic conditions. For Rome, the import of grain as tribute from rich soils killed the competition of Italian soil, and slave labor was rather a result than a cause of the elimination of the old peasantry.

Perhaps, indeed, Mr. Galton would not dissent from the general proposition that eugenics involves politics. But it seems to me that the necessary regression is obscured when it is suggested that eugenics is mainly a matter of the right adjustment of individual conduct, in a social system politically fixed. If this be meant, I submit that it is a form of the fallacy of prescribing "a new heart" as the sufficient means to social regeneration. Nations can only very gradually change their hearts, and part of the process consists in changing their houses, their clothes, their alimentation, their economic position, and their institutions as a means to the rest.

BY W. BATESON, M.A., F.R.S.

With the objects of the paper everyone will sympathize, and there can be no doubt that this discussion will do something to promote the study of heredity and the introduction of scientific method in the breeding of man and other animals. An exact knowledge of the laws of inheritance will be a factor in the destiny of mankind, as large as, if not larger than, any yet brought to bear.

I notice that in the paper stress is laid on the "*actuarial* side of heredity,"

and on the application of statistical methods of a comprehensive character to the solution of the problems involved. Students of the subject are well aware what interesting results have been attained by those methods, especially in the hands of Mr. Galton himself—work that did much to develop this branch of science at a time when it was almost abandoned by naturalists. It may, nevertheless, not be inopportune, on such an occasion, which may well prove to be a point of new departure, to recall the fact that, though these “actuarial” methods were appropriate to an incipient stage of the inquiry, means of attacking the problem directly and with greater effect are now well developed.

In nearly every case to which the method of accurate experimental breeding has been applied, it has been possible to show that the phenomena of heredity follow precise laws of remarkable simplicity, which the grosser statistical methods had necessarily failed to reveal. Inquiries, therefore, pursued on those older lines are largely superfluous, and give ambiguous results, inasmuch as they serve to conceal an underlying physiological order which closer analysis would make readily evident. It is, therefore, doubtful whether the prodigious labor needed for the collection and reduction of comprehensive statistics as to the distribution of hereditary qualities is well spent, in view of the probability that the significance of the deductions drawn will disappear so soon as it becomes possible to apply a more stringent method of research.

The “actuarial” method will perhaps continue to possess a certain fascination in regions of the inquiry where experimental methods are at present inapplicable, but conclusions drawn from facts not capable of minute analysis can at best be regarded as interim conclusions, awaiting a test which, in all likelihood, they will not endure.

I would, therefore, urge that those who really have such aims at heart will best further “eugenics” by promoting the attainment of that solid and irrefragable knowledge of the physiology of heredity which experimental breeding can alone supply.

BY C. S. LOCH, B.A.

1. With regard to the study of eugenics, and the possibility of the idea which the word represents becoming operative in the lower section of society, an intelligent regard to social welfare, beyond what is now prevalent in any class, is the first condition. Is it possible to promote the objects of the writer of the paper, except indirectly, so far as that section is concerned? As they learn at public elementary schools, or in other ways, the conditions of healthy life, they may realize the necessity of what in a broad sense may be called good breeding.

2. To carry out the suggestions of Dr. Galton for the other higher sections of society may possibly be easier; but propagandism of a certain kind during the last ten or fifteen years has tended rather to promote a reduction in the number of children born, and that among a good class, than what one may call the better breeding of a larger number of children.

3. It may be agreed that a scientific statement on the subject would touch the imagination of a large number of our people, and that steps toward increasing our knowledge might be more widely adopted; but unless definite laws are discovered which can be practically turned into social commandments, and can be so stated and preached with a kind of religious fervor, it seems hardly possible to make very much further progress on such a question. Are we near the time at which such laws can be formulated in a manner that would meet with general acceptance on the part of all scientific students of the subject?

MR. GALTON.

When this debate began, I was extremely unhappy at the quality of it. The two first speakers really seemed to me to be living forty years ago; they displayed so little knowledge of what has been done since. More than one of the later speakers were really not acquainted with the facts, and they ought not to have spoken at all. We are much indebted to Professor Weldon for raising the debate to a higher level.

Mr. Wells spoke of “stirpiculture” as a term preferable to “eugenics.” I

myself inverted it, and deliberately changed it for "eugenics." Dr. Hutchison believes that environment is far more important than stock, but you know perfectly well how one baby, dog, horse, differs enormously from another by nature; and surely it is not denied that we should take pains to increase the multiplication of the best variants.

Mr. Elderton in his few remarks touched on an important point—that the insurance offices might give a great deal of information. I quite agree with him in that, and also on the correlation of certain diseases and fertility. I thought it was always said that consumptive mothers were prolific. I remember I went with very great pains into medical data to get certain results of that kind. I was appalled at the want of precision in getting up the facts. The facts brought forward by one group did not agree with those brought forward by another. I went to the Consumptive Hospital at Brompton, and found a total divergence of opinion as to what consumption was. I am speaking of twenty or thirty years back.

As to Mr. Kidd, I do not attach importance to his points. His drones would have selected the best drones, and each one would have selected the best of its kind and worked out their own civilization in their own way.

I have little more to say, except that I do feel that if the society is to do any good work in this direction, it must attack it in a much better way than the majority of speakers seem to have done tonight.