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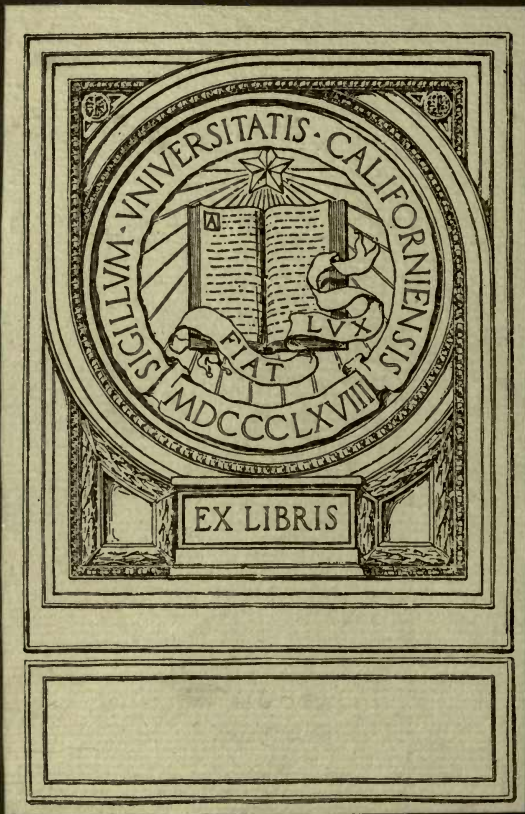
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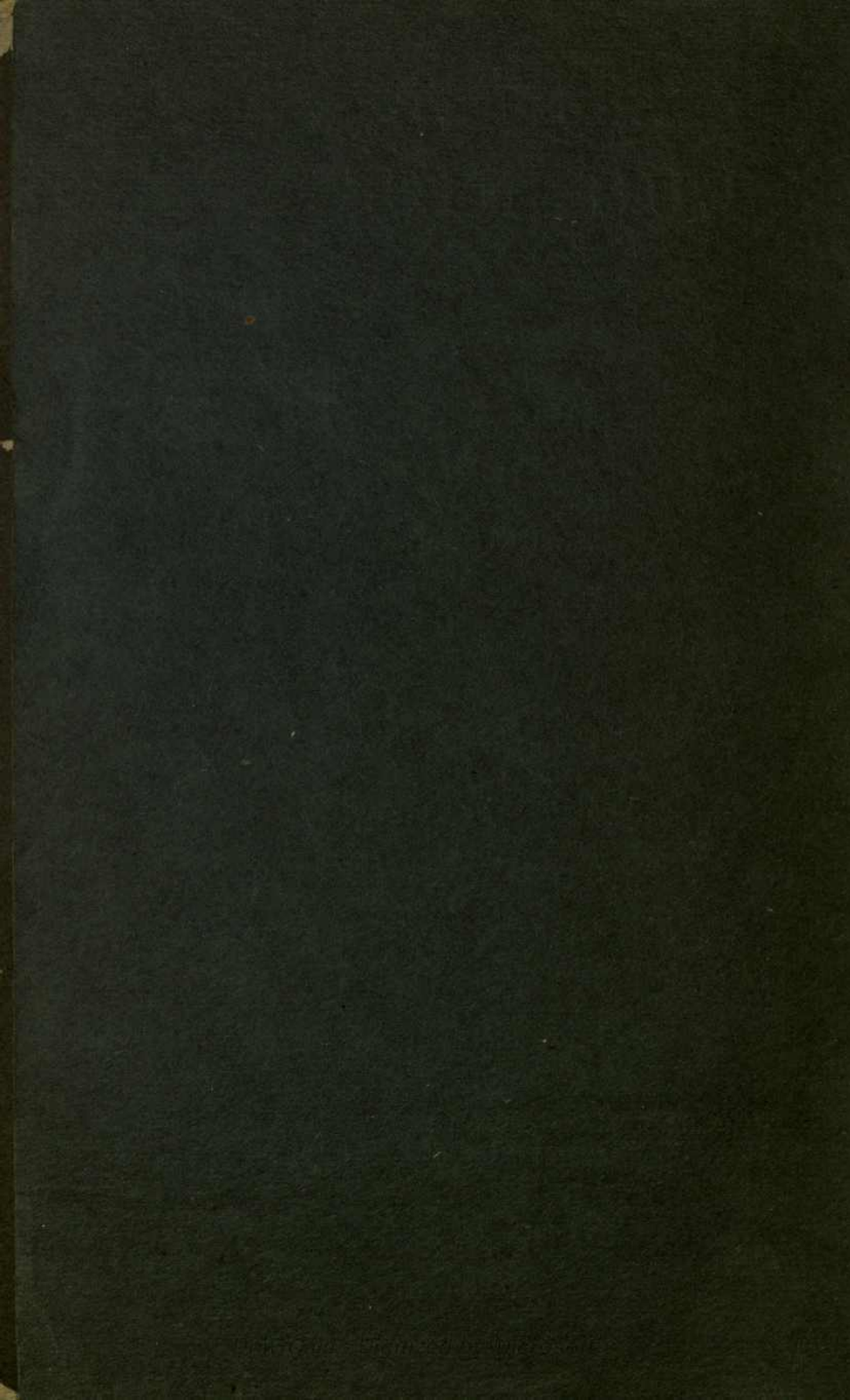
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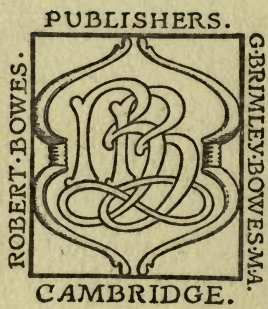
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EUGENICS



AN INTRODUCTION TO EUGENICS

BY

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PREFACE

THIS small volume is intended as an introduction to the study of Eugenics, a branch of knowledge which, although but recently started on its way, is attracting more and more as each year passes the attention of the thoughtful members of the community.

A few years ago, the name itself, Eugenics, was unfamiliar to many readers ; and even yet the idea that problems concerning social organisation, population and the future welfare of the race can be treated from a biological point of view does not commend itself to those persons who are accustomed to act without an informed sense of responsibility and to initiate social undertakings without first securing a firm footing on the basis of ascertained fact.

As in all branches of science, a knowledge of the range and methods involved in the inquiry is the first requisite to a clear understanding of the subject. Consequently greater stress has been laid on this aspect of Eugenics than on any theoretical deductions to which, as yet, research has led.

It is true that the assured facts are not yet numerous ; but for a science which is still in its infancy, the results are full of promise for future achievement. A few years of work cannot suffice to touch even the surface of the ground to be submitted to investigation, much less to produce a series of final answers. The most striking results attained are the opening up of an immense field of inquiry and the realisation of the almost oppressive importance that must be attached to a right solution of the problems at issue.

CAMBRIDGE, *January*, 1912.

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CHAPTER I

HISTORY OF EUGENICS

1. The Meaning of Eugenics.

The late Sir Francis Galton, the founder of the branch of science which he called Eugenics, defined it as "the study of agencies under social control that may improve or impair the racial qualities of future generations either physically or mentally."

As thus defined, the subject includes the study of all agencies which have racial importance, whether those agencies are concerned with nature or with nurture, that is, with the natural qualities and gifts implanted in mankind by heredity, or with the development or suppression of those qualities or gifts by the outward circumstances of the life either of the individual or his parents. In other words, it includes the study of the influence on race both of heredity and environment.

But Galton satisfied himself that heredity was far more powerful than environment; and, since the time of his early researches, much evidence pointing to the same conclusion has come to light. Hence Eugenics is concerned chiefly, though not exclusively, with the study of heredity and its bearing on social problems.

2. Galton's Life and Work.

Francis Galton was born in 1822, and educated at King Edward's School, Birmingham, and Trinity College, Cambridge. After some years of travel and exploration in Syria and among the little-known peoples of Central Africa, he carried out valuable work in meteorology, and about 1869 he began to publish researches on

heredity in mankind. As far back as 1865, however, he had been impressed with the importance of obtaining exact measurements of every measurable faculty, and of continuing such measurements in definite families for more than one generation.

With this idea in view he founded anthropometric laboratories, with appropriate apparatus for weighing and measuring men and women. Laboratories were established at Cambridge, at Marlborough School, and at the South Kensington Museum, while a temporary one was opened in connexion with the International Exhibition of 1884. Measurements were obtained of height, weight, span of arms, strength of pull and squeeze, breathing power, keenness of sight and hearing, and colour sense, and four hundred complete sets of observations were published in 1884.

He also attempted to obtain some measures of resemblance between different individuals of the same type, especially among lunatics and criminals, and did much to elucidate the peculiarities of finger prints, a subject which had been developed by Bertillon in France, to assist in the identification of criminals.

As an extension of his labours on the measurement and inheritance of physical qualities of men, Galton turned his attention to the more elusive but even more important subject of the inheritance of mental powers. People were ready enough to recognize that physical qualities were inherited, but the proof of the corresponding inheritance of mental characters was more difficult to obtain and less easily accepted by others. Nevertheless, in the course of his studies, Galton soon satisfied himself that mental qualities were inherited in the same manner as physical qualities, and that, here too, heredity was a far more powerful agent in human development than nurture. Consequently, in considering the possibility of raising the race till it should possess on the average the quality and intensity of ability and character that are now the birthright of a few individuals only, the stress which hitherto had been laid on environment passed to heredity. Here it

became necessary to ascertain as well all possible facts bearing on the relative fertility of the various types of men, and it was Galton who first called attention to the effect that marriages with heiresses have on the fertility of families into which they marry, since heiresses, among other possessions, often inherit the infertility or delicacy which has caused them to be the sole or only surviving child of their parents.

There could be no more impressive example of the inheritance of human faculty than the family circle to which Galton himself belonged. His paternal grandfather, S. J. Galton (1753-1832), a successful man of business, was much interested in science and statistics, and was a member of the distinguished "Lunar Society," which flourished in the midlands of England at the close of the eighteenth century. His mother's father was Dr. Erasmus Darwin (1731-1802), physician, poet, philosopher, and man of science, who was also grandfather by his first wife of Charles Darwin (1809-1882), the great naturalist, who, in his turn, on his mother's side, was a grandson of Josiah Wedgwood (1730-1795), the famous potter. The allied families of Darwin, Galton, and Wedgwood have given no less than ten Fellows to the Royal Society, many of whom have received at one time or another the various medals and other signal distinctions which it is within the power of the Society to award.

Galton had been struck by the many instances of the transmission from father to son of definite mental qualities, which were brought to light by the class lists of the Universities, and in 1874 he followed up this line of research by issuing circulars to Fellows of the Royal Society asking for particulars likely to throw light on the subject. Ten years later he offered £500 in prizes to those persons who could answer most completely an elaborate list of questions concerning members of their own families, parents, grandparents, brothers, sisters, and children, and other more distant relatives. Both these inquiries met with a fair response, and much valuable material was

accumulated to form a statistical basis for the new branch of knowledge.

Galton also examined the records of the late Sir J. E. Millais' stud-book on the breeding of basset hounds, containing details of about a thousand animals. The result of these early investigations was the tentative formulation of what he called the Ancestral Law, which states that, in the making of any one individual, the average contribution of each parent is one-quarter, of each grandparent one-sixteenth, and so on. This expression of ancestral inheritance has not been confirmed by later work as a law for each individual; but, in dealing with large numbers, it still remains a very fair expression of the average influence of each ancestor on a common descendant, or, in single instances, it is of use as a means of calculating the chances that ancestral traits will reappear in any individual.

Charles Darwin published his book on the *Origin of Species* in 1859. "I am fully convinced," he wrote in the Introduction, "that species are not immutable . . . and that Natural Selection has been the most important, but not the exclusive, means of modification." Galton spoke of the publication of this work as making a marked epoch in his own mental development. He was encouraged by Darwin's views to pursue his inquiries into the subject of heredity, and on the future possibilities of the development of the human race, under the influence of natural or conscious selection. Up to the time of the publication of the *Origin of Species* and the assimilation of its contents by an often reluctant circle of readers, the accepted views on heredity were so contradictory and so purely empirical that it is almost impossible to summarize them. Generally speaking, it was allowed that all physical and some mental qualities were inherited among the animal world, but that mankind, being, as was then supposed, an entirely separate creation, could not be subject to the same laws. This attitude of mind is not yet extinct, and its persistence affords a striking instance of the difficulty that attends the spread of any

new idea in a partially intelligent and partially educated community, like our own. It is sometimes to be met with in a modified form which submits the physical qualities of men to the general laws of inheritance, but exempts the mental faculties from the field of their domination.

One great merit of Darwin's work, especially in its later expression in the *Descent of Man*, published in 1874, was to place man in his proper position in the animal world, and to show that he was subject to the same processes, the same limitations, the same influences as the rest of creation, and no longer required entirely separate methods of investigation and study. The hope expressed by Darwin that his labours might throw much light on the origin of man and his subsequent history, has been amply fulfilled.

Galton published his *Hereditary Genius, an Inquiry into its Laws and Consequences* in 1869. "I propose to show," he wrote in his Introduction, "that a man's natural abilities are derived by inheritance, under exactly the same limitations as are the form and physical features of the whole organic world. . . . I shall show that social agencies of an ordinary character, whose influences are little suspected, are at this moment working towards the degradation of human nature, and that others are working towards its improvement. I conclude that each generation has enormous power over the natural gifts of those that follow, and maintain that it is a duty we owe to humanity to investigate the range of that power, and to exercise it in a way that, without being unwise towards ourselves, shall be most advantageous to future inhabitants of the earth."

Darwin at once recognised the great importance of his cousin's work, and wrote a letter full of eager approbation. "I do not think," he says, "I ever in all my life read anything more interesting and original. . . . I congratulate you on producing what I am convinced will prove a memorable work. I look forward with intense interest to each reading, but it sets me thinking so much

that I find it very hard work ; but that," he goes on, with characteristic modesty, "is wholly the fault of my brain and not of your beautifully clear style."

Thus, besides the direct expression by each author of the purpose and intention of these two remarkable books, there is placed on record the effect that each volume had on the mind of the other. Indeed, these two kinsmen were wonderfully alike in their originality, their perseverance, and the modesty and loveableness of their characters.

Galton himself summarizes the result of his inquiry in one of the last chapters of *Hereditary Genius*. He had dealt with three hundred families, all of historic interest, containing between them nearly one thousand eminent men, of whom over four hundred were to be accounted illustrious. They had been divided into eight groups—judges, statesmen, commanders, literary men, men of science, poets, artists, divines; and each group was studied separately, so that its peculiarities could be analysed and reserved for special comment.

"The general uniformity in the distribution of ability among the kinsmen (of eminent men) in the different groups, is strikingly manifest. The eminent sons (of an illustrious man) are almost invariably more numerous than the eminent brothers, and these are a trifle more numerous than the eminent fathers. On proceeding further down the table, we come to a sudden dropping off of the numbers at the second grade of kinship, namely, at the grandfathers, uncles, nephew and grandsons. . . . On reaching the third grade of kinship, another abrupt dropping off in numbers is again met with, but first cousins are found to occupy a decidedly better position than other relations within the third grade."

"We further observe, that, while the proportionate abundance of eminent kinsmen in the various grades is closely similar in all the groups, the proportions deduced from the entire body of illustrious men, 415 in number, coincide with peculiar general accuracy with those we obtained from the large subdivision of 109 judges. There

cannot, therefore, remain a doubt as to the existence of a law of distribution of ability in families. . . .”

The law Galton here refers to may be summarized as follows: To every group of ten illustrious men, who have any eminent relations at all, we may expect to find 3 or 4 eminent fathers, 4 or 5 eminent brothers, 5 or 6 eminent sons. Taking this as a general rule, the expectation will prove right in 17 instances out of 24, that is, in about three-quarters of the cases. In the second grade of relationship, the chance of each grandfather of an illustrious man being eminent is 1 to 25, each uncle or nephew 1 to 40, each grandson 1 to 29. In the third grade of relationship the chance of each member becoming eminent is about 1 to 200, excepting in the case of first cousins, where it is 1 to 100.

These figures are very striking when it is remembered that estimates of the proportion of eminent men to the whole population, made by Galton and others, give a ratio of about two hundred and fifty to the million as an ample estimate. Thus, a family in which abilities leading to eminence have once appeared is much more likely to give birth to another man of distinction than a family with no previous record of special ability.

Galton closed his book with two most suggestive chapters on the comparative worth of different races, and on the influences that affect the natural ability of nations. The last paragraph of the general considerations must be quoted in full, since it reveals the attitude of mind of the great worker to the labour he had undertaken. It is, moreover, of special interest in connexion with the philosophic views concerning human evolution and its problems, which are now coming to the front.

“Nature teems with latent life, which man has large powers of evoking under the forms and to the extent which he desires. We must not permit ourselves to consider each human or other personality as something supernaturally added to the stock of nature, but rather as a segregation of what already existed, under a new shape, and as a regular consequence of previous condi-

tions. Neither must we be misled by the word 'individuality,' because it appears from the many facts and arguments in this book, that our personalities are not so independent as our self-consciousness leads us to believe. We may look upon each individual as something not wholly detached from its parent source,—as a wave that has been lifted and shaped by normal conditions in an unknown, illimitable ocean. There is decidedly a solidarity as well as a separateness in all human and, probably, in all lives whatsoever; and this consideration goes far, as I think, to establish an opinion that the constitution of the living universe is a pure theism and that its form of activity is what may be described as co-operative. It points to the conclusion that all life is single in its essence, but various, ever varying, and interactive in its manifestations, and that men and all other living animals are active workers and sharers in a vastly more extended system of cosmic action than any of ourselves, much less of them, can possibly comprehend. It also suggests that they may contribute, more or less unconsciously, to the manifestation of a far higher life than our own, somewhat as—I do not propose to push the metaphor too far—the individual cells of one of the more complex animals contribute to the manifestation of its higher order of personality."

Francis Galton died in 1911, aged nearly ninety. Longevity, he remarks, was a characteristic of his mother's family, and he records the ages of their decease—the great grandmother at ninety-six, grandmother at eighty-five, mother just short of ninety, eldest brother at eighty-nine, two sisters at ninety-three and ninety-seven, and a (then) surviving brother alive aged ninety-three. He lived to see the establishment of the Biometric Laboratory at University College, London, where so much admirable work has been done under Prof. Karl Pearson, and endowed a Research Fellowship and Scholarship in connexion with it. He helped to establish the Eugenics Education Society in London, with the object of popularizing the results of their labours, and of others under-

taken in the same direction. By his testamentary dispositions, he secured the permanent foundation of a professorship, and provided for the continuation of the work which he had so long inspired and directed.

The science of Eugenics will always owe a profound debt of gratitude to Galton, not only for the pioneer work he did in connexion with the subject, but for the spirit of reverence and humility with which he handled every branch of knowledge that passed under his master hand.

3. Biometry.

Arising from Galton's pioneer work, a school of research has arisen to carry on and develop his methods.

In 1845, Quet let pointed out that the mathematical theory of probability was applicable to many biological problems. If we toss ten coins a large number of times, we shall very often get five heads and five tails falling together, and very seldom get all heads or all tails. So with the large number of chances which go to make up the stature of men. Generally, some will tell one way and some the other, and we get men of medium height. But occasionally nearly all the factors will chance to fall one way, and we get an unusually tall or exceptionally short individual. By measuring large numbers, we find results in accordance with mathematical theory.

And so in the measurement of inheritance : in dealing with large numbers of cases, chance errors neutralize each other, and, if the instances are fair samples, and not complicated by factors other than those under investigation, we can draw valid conclusions.

For instance, if we measure the height of all the sons of very tall fathers, we shall find that, on the average of large numbers, they exceed the mean stature of the race by about half as much as do their fathers. This result is expressed in technical language by saying that the "coefficient of correlation" of height between fathers and sons is one half, or 0.5.

Now a great part of the work carried on by Professor

Karl Pearson and his pupils at University College, London, consists in the determination of these coefficients of correlation. The intensity of inheritance of many physical characters has been measured, and results ranging round the same value, 0.5, obtained. Moreover, by comparing the places in University class lists and the forms in schools of fathers and sons, and brothers and brothers, similar coefficients have been calculated for the inheritance of mental qualities. Here, also, the values of the coefficients are about 0.5, and it follows that in these cases the intensity of inheritance is the same for mental as for physical characters.

4. Mendel and his Laws of Inheritance.

While Darwin, Alfred Russel Wallace, Huxley and other workers were investigating the origin of species in England, another man, unknown to fame until many years after his death, was sowing the seeds of a new development of human thought in his garden at the Königs-kloster, otherwise known as the Augustinian house of St. Thomas at Brünn in Austria.

Gregor Johann Mendel was born in 1822, and died "Prälat" (Abbot) of his house in 1884. He did not find himself in full agreement with Darwin on the origin of species, observing that there must be something more behind, and with a view of investigating the subject, began a long series of experiments on peas, which lasted for over eight years. The results were communicated to a small society in Brünn about 1865, but passed unnoticed. Mendel also studied the inheritance of qualities in bees, keeping about fifty hives for that purpose in the monastery garden. The lack of appreciation of his earlier work led to the suppression of the results of these investigations, and even the notebooks in which he laboriously recorded his observations have entirely disappeared. It is melancholy now to reflect on the total neglect of his discoveries, and to know the great disappointment that the want of any sympathetic notice brought to this gifted man. His contemporary and fellow-worker,

Darwin, would have been the first to recognise the importance of Mendel's labours, which might have modified the course of his own arguments on the evolution of species, but he never saw any of the results. Had the work come under Darwin's notice, it is fair to surmise that Mendel's discoveries would have earlier taken their proper place in evolutionary philosophy.

It is not easy to give in an abstracted form the results of the scientific labours of the Abbot of Brunn. Briefly speaking, he showed that it is possible to select certain individuals of a common species, having between them a number of differentiating characters, such as height, colour, or seed shape, and to trace the inheritance of each character as a separate unit. The separate qualities appear to be transmitted independently of each other, to be present as separate factors in the germ-cells, and the chances of their reappearance in the offspring are subject to definite laws of inheritance.

On one occasion Mendel experimented with the tall and dwarf varieties of the common eating pea, each of which, when allowed to self-fertilise in the usual way, breeds true to its type. On crossing the two varieties, whichever was the pollen or the seed-producing plant, nothing but tall plants resulted from the cross. When self-fertilised seeds from these plants were sown the following year, one-quarter proved to be dwarf plants, which once more bred perfectly true amongst themselves, and three-quarters were tall plants. But these tall plants, when their seed was sown, proved to be of two sorts; about one-third of them (one-quarter of the original number) gave rise only to tall plants representing a pure type, while the remaining two-thirds once more produced offspring mixed in the proportion of three-quarters tall and one-quarter dwarf.

Thus certain qualities—for instance, tallness in the case of the pea—if present at all, manifest themselves in the outward appearance of the offspring; and other qualities, such as dwarfness, may be transmitted from the germ-cells of the parent to those of the child and will

only become outwardly apparent in certain circumstances. Such a condition occurs when both parents possess the peculiarity in the concealed form, in which case a definite proportion of their offspring will be affected openly by it; and, as long as their descendants breed among themselves, or mate with others similarly constituted, they will transfer the special quality in an evident form to all their descendants, thus establishing a definite species, with a marked character of its own.

Two terms are in use to express the difference of nature between these two sets of qualities. Qualities which, if present at all, show outwardly, but may mask the existence of other opposing characters in the germ-cells, are known as dominant—the master qualities; qualities which may exist in a concealed form, and be transferred unnoticed from parent to child until a favourable opportunity occurs for their manifestation, are called recessive—hidden or backward searching. No individual can transmit a quality, which has been shown to be dominant, unless it be evident that he possess it. The probability of the inheritance of a recessive quality can only be deduced from a knowledge of the pedigree, and can only become a certainty when some of the offspring show the peculiarity outwardly.

* This account gives the barest outline of Mendel's discoveries. An almost infinite variety of disturbing or amplifying factors have to be considered. One quality may act as a dominant to a second and as a recessive to a third, or be dominant in a male and recessive in a female. Again, qualities apparently occasionally act in couples, as though they were locked together in some way; or again, certain qualities will never appear in the presence of some other peculiarity, as though there existed some definite cause of incompatibility between them.

As regards plants and animals, some headway has been made in tabulating the various possible characters, and in examining their relations to each other. Professor William Bateson has carried out and inspired a long series of experiments on different properties in fowls,

mice, pigeons, canaries, guinea pigs, sheep, sweet peas, stocks, primulas, and various flowers; while Professor Biffen has created and established some new and commercially valuable species of wheat.

In the case of human beings, direct experiment is of course not practicable. Observation is the only method of effecting any progress in the subject. The collection of pedigrees of sufficient size and authenticity is necessarily slow work, and the examination of the individuals of a family who may be affected with some marked peculiarity requires the presence of a skilled observer often in various parts of the country or even of the world.

Still, in spite of great difficulties, very real progress has been made during the past ten years, and certain diseases, malformations, and conditions to which human beings are subjected have been shown definitely to follow Mendelian lines. Of the Mendelian inheritance of normal characters in man, there is as yet but little direct evidence, perhaps owing to the enormous difficulty of separating out the various factors. One case only, that of eye-colour, has shown its complete adherence to Mendelian laws. But many abnormal states have yielded up the secret of their often apparently wayward transmission. Amongst them may be noted colour-blindness, night-blindness, brachydactyly (the shortening of the fingers and toes by the omission of one joint), some types of cataract, a special form of muscular paralysis known as Gower's disease, and certain skin diseases. All the above-named affections appear to act as dominants, although the statement must be qualified with regard to sex, as, for instance, in the case of colour and night-blindness. Deaf-mutism, on the other hand, seems to be a recessive quality, and may appear at any time in a family which has already shown that it possesses the defect. The marriages of cousins are specially liable to make manifest any recessive abnormalities or weaknesses in the common stock, since the offspring have every chance of inheriting the peculiarity from both parents—a necessary condition to ensure the open appearance of a recessive quality.

The collection of sufficient information with regard to the inheritance of diseases and physical malformations necessarily must rest largely in the hands of medical men, for such cases come most naturally and frequently under their notice.

The measurement and tabulation of most normal qualities of mind and body, which seem not to conform to Mendel's principles, are more intricate and more elusive processes, and it is only by dealing statistically with large numbers of individuals that any general laws are likely to be established.

5. Lombroso's Work on Criminals.

Another more specialized line of research on the inheritance of qualities in man was inaugurated in Italy, by the work of Cesare Lombroso, who, originally an army doctor, began in 1864 a series of studies on the Italian soldiers, and afterwards made an investigation of the physical structure and family histories of members of the Italian criminal classes. He found in many cases that the criminals who came under his observation, or on whom after death he was called upon to make post-mortem examinations, showed numerous anomalies of structure in the brain, face, and skeleton, which indicated that they and their relatives were in truth reversions to types which have disappeared from normal civilised society, and were allied with decadent and savage stocks; while in other cases, although they came from well-to-do or honest families, there was a previous ancestral history of epilepsy, insanity, alcoholism, hysteria, or other forms of nervous degeneration. Lombroso came to consider that certain criminal tendencies were but a specialized variety of manifestation of these neurotic or nerve-diseased conditions.

In America and on the Continent, schools of penal jurisprudence have come into existence, which maintain that criminals coming under either of these two categories cannot be cured or even deterred by any form of punishment, since their organization differs in its essence from that of the normal individuals for whom,

and by whom, present society is constituted, by whom they find themselves surrounded, and on whom they prey; and that some form of perpetual restraint and segregation is the only way of treating persons who are in truth reversions to an outgrown, anti-social, and non-moral type of decadent humanity, and of putting an end to the moral perversions which are manifested in their organisms.

6. Racial Variation.

It was many years after the publication of *Hereditary Genius* before Galton's work received any general recognition, even among the more educated sections of the community; and it was only very gradually that his central idea of the possibility of a gradual alteration in the quality of the nation dawned on the intelligence of a sufficient number of persons to lead to some further inquiry being undertaken into the subject. The year 1903 saw the appointment of an Inter-Departmental Committee to investigate the alleged physical deterioration of the nation, and though their report gave no definite opinion on the question at issue, enough evidence was collected to show that the physical condition of vast masses of the people was supremely unsatisfactory, apart from any theorising on the actual subject of a progressive deterioration. But the members of the Committee devoted themselves almost entirely to the study of conditions of life and labour which affect injuriously the health of the existing population. They produced a most valuable document dealing with the subject of environment, a subject which is indeed of supreme importance to each individual, since, having received his due quota of qualities at birth, he must look to favourable surroundings as the only chance of developing himself to the full. At the same time, all modern scientific inquiry goes to show that the direct influence of environment, whether in the matter of health, education, or sanitation, is limited in general to the effect produced on persons actually in existence and their immediate offspring, and

that it can alter in no way, either to improve or to impair, the racial qualities of more distant generations, physically or mentally, except in so far as it encourages or obstructs the increase of one type of humanity rather than another.

It follows therefore, accepting Galton's definition of the science of Eugenics as a starting-point, that it is not within the scope of the subject to inquire into the effect of environment on the individual, except in so far as its workings may mask or disturb hereditary influences of a more fundamental character. It is the less necessary, since nearly all the efforts of legislators and of social reformers for years past have been devoted almost entirely towards endeavouring to improve the condition of the least efficient existing sections of the community, and enormous sums of money are spent annually with that sole object.

The pervading state of mind of society, as well as the natural tendency of each individual and generation to look after their own interests, makes it essential that at least one branch of human knowledge should be devoted to the study of influences that may control the future of the human race, and that one small group of workers should put the welfare of generations to come before the interests of persons who are actually in existence.

For the purpose of the present volume, which is to serve as an introduction to the study of Eugenics, it is proposed, in the first place, to give a brief abstract of some of the subjects that have been already studied, or are ripe for investigation, such as, in chief, the inheritance of certain diseases and mental qualities and the various conditions that serve to modify their effects. In the second place, some indications will be given as to methods of research and the directions in which future advances may be made. Then will follow a short account of the various influences, social and political, that are at work, and are unconsciously affecting the future prospects of the nation, and finally an outline will be suggested of the ethical and religious problems which are involved in the subject of the advance or decay of the human race.

CHAPTER II

RACIAL QUALITIES

1. The First Problem of Eugenics.

The first problem of Eugenics, as Galton said, is to investigate the various racial qualities, and to examine as far as possible how they are distributed among the different sections of the population.

It is, of course, out of the question to give here an adequate idea of all the different aspects and activities of human life that eventually will be included within the scope of Eugenics. We can attempt to describe only some instances of the qualities the examination of which has already yielded some definite result, and to indicate a few of the directions in which investigation is now proceeding. Then, in a future chapter, we shall study the chief methods and agencies by which attempts have been, and are being, made to take stock of the national store of good and bad qualities, and to mark any probable advance or decline.

2. Susceptibility to Disease.

In the long history of the human race, and especially since men have been congregated together in cities, it seems probable that disease has been one of the most powerful agents in effecting some form of selection. Moreover, unlike certain other selective agencies, its power is still great among us. Far back in the annals of civilisation, there are records of plagues sweeping across Europe from India and China, and removing thousands of the most susceptible subjects. Plague and cholera still retain their deadly power where the conditions

are favourable to their spread. Other diseases, such as measles and smallpox, are now less fatal among the populations of Asia and Europe. It is possible that this partial immunity may have been gained by reason of the fact that measles and smallpox are diseases of very high antiquity. They have hardly ever been absent from civilised communities; all stocks that were especially liable to their attacks have long since been removed, and any person now born with an affinity for the specific microbe still stands a fair chance of dying before he has been able to bequeath his weakness to another generation. At any rate it is known that when these and similar diseases are introduced among populations that have had no previous experience of their effects, epidemics at once occur that may be compared in the rapidity and extent of their ravages with the outbreaks of plague and cholera in mediaeval Europe and modern Asia. It was thus that the original Red Indian inhabitants of North America were swept off the face of the earth in hundreds of thousands, and that many of the Pacific Islands have been depopulated by the importation of European city-bred diseases.

Now resistance to, or immunity from, a specific disease is not necessarily among the highest qualities of the human race. But it seems clear that such influences must always play an important part in determining the prosperity of any people, especially of a town-bred population. Apart from any actual death-rate, the cost and exertion of tending the infected persons is considerable, the actual loss of productive labour during illness cannot be ignored, and the chance of a permanently enfeebled constitution, when recovery follows, must not be neglected. The ideal community would be one that was not susceptible to the attacks of the disease rather than one in which science had brought to a high degree of probability the chance of escape from infection by means of expensive sanitary precautions, or recovery when attacked, owing to skilled medical attendance. Moreover, except when death has occurred before the

age of parenthood, it does not appear that any permanent access of immunity to disease will be recorded among the future racial gains of the people, as a result of the epidemic.

Bearing these considerations in mind, it is extremely interesting to study the investigations which have been set on foot in connexion with consumption or tuberculosis, a disease in which heredity and environment seem each to play an important part.

Consumption is terribly prevalent throughout Western Europe. In the British Isles this disease is responsible for more deaths than any other single cause. Few people who live an active life among their fellow-men can escape the constant risk of infection ; yet the majority of persons do not contract this disease, and many others who become infected recover without being aware of their misadventure. Formerly, when consumption was more prevalent and fatal, it was well recognised that certain families were specially liable to its ravages, but recently the discovery of its mode of transmission by definite germ-infection has led to some disregard of the hereditary factor.

It is clear that certain conditions of life and labour greatly increase the chance and the intensity of the infection. Lack of ventilation, absence of sunlight, a damp steam-heated atmosphere, exposure to rapid variations of temperature, the breathing in of air charged with particles of dust, cotton or grit are all powerful agents in the increase of tuberculosis. But beyond these environmental influences, it has been shown that persons with a tubercular parent—even if that parent be dead, and consequently not a possible source of infection—are more liable to attack than persons coming from sound stock, and that the possession of two tubercular parents greatly increases the chance of infection. "Infection," so-called, is also more prone to occur between brothers and sisters, who inherit from a common parent, than between husband and wife, where one comes from a resistant stock, in spite of the closer association ; though there is evidence to

show that persons of tubercular stock are inclined to intermarry, possibly owing to some sympathetic understanding of each other's infirmities, and that it is not at all uncommon to find both parents affected, owing to this cause.

Two points must specially be emphasized in connexion with the inquiry into tuberculosis. In the first place, there is no natural reduced fertility in the case of tuberculous stocks, and possibly a slight increase must be noted in the infected artisan classes; and in the second place, the elder offspring, especially the first and second, appear to be more subject to consumption than the younger members of a family. A similar result has been noted for the occurrence of insanity in stocks liable to mental derangement. If this special liability of the earlier born to any weakness in the family be found to be true for other diseased conditions of mind and body, a very serious factor working for national decay must have been introduced by the growing practice of limiting offspring to two or three children only. A relatively larger proportion of predisposed individuals is being added to the community, which may in time counterbalance any efforts to diminish the risk of infection.

Deaf-mutism, on the other hand, as opposed to tubercular disease, is a condition in which there is no possibility of microbic infection. It forms therefore an excellent study of a part of the subject in which the effects of environment may be put on one side entirely.

From an inquiry into the family histories of some seven hundred deaf children in England, and of far larger numbers of afflicted persons on the Continent and in the United States of America, it has been ascertained that something between a third and half the affected individuals came from families having already a record for deaf-mutism, and that, of these individuals, a large proportion are the offspring of the marriages of cousins or other blood-related parents. In about one-quarter of the cases, no sort of family history could be put together, so that the frequency of inheritance is probably much

larger than appears from the figures given above. It was also observed that congenital deafness, *i.e.* deafness from birth, is far more common among Jews, who intermarry largely, than among Protestants, where the custom is less common, and that among Roman Catholics, where cousin-marriages are discouraged, the proportion of deaf persons is less than among the Protestants.

In considering the probability of the occurrence of deafness from hereditary causes, it was found necessary to take account of collateral relatives—cousins, aunts and uncles, etc.—as well as parents and direct ancestors. This result might be expected from a knowledge of the fact already pointed out in the first chapter, that deaf-mutism seems to behave as a Mendelian recessive; the intensive effect of cousin-marriages is in accordance with what should be anticipated in the inheritance of a recessive character. One of the families investigated throughout eight generations gave a total of forty-one deaf-mutes out of one hundred and seventy-one individuals—a proportion of about one in four.

Where deaf-mutism does not pre-exist, intermarriage will not create it; where it is latent in both parental stocks, intermarriage will cause its appearance in some of the children. There are two interesting examples of communities where interbreeding has gone on for many years, which illustrate these two social states. In the island of St. Kilda, off the coast of Scotland, with a small self-contained intermarrying population, it is said that no case of congenital deafness has ever been known. On the other hand, on a small island off the coast of Massachusetts, where also intermarriage is frequent, there are twenty deaf mutes in a population of five hundred persons, indicating the possibility of the gradual formation of a deaf-mute variety of the human species in America.

It may be mentioned that the cost of educating a deaf-mute child in the special schools of the London County Council amounts to about £23 per annum, as against some £5 spent on the far more profitable normal

child. Deaf-mutism is therefore a very expensive condition for any community to maintain, even if the children, when educated, are able to support themselves.

3. Mental Characters.

The inheritance of mental qualities of all kinds forms a very important branch of eugenic research. Galton devoted many years to the study of ability, and traced its descent through many allied families; his results have been given in the previous chapter. Other workers have examined the class lists of the Universities, and the pages of the *Dictionary of National Biography*, with the same purpose and to the same effect. On the Continent, it has been shown that the families of the Protestant clergy produce a high proportion of able men and women, from which it may be deduced that the celibacy of the Roman Catholic clergy causes a serious racial loss.

(a) *The Inheritance of Mental Defect.*

At the other end of the scale of mental capacity, there are to be found a large group of persons suffering from mental defect, ranging from actual idiots to individuals who may be described as feeble-minded and are incapable of competing on equal terms with their fellow-men. From this degree there is another gradual rise in mental power to a class of persons who may be termed rational without being intelligent, who can work under direction, but are unable to undertake responsibility, or to foresee and make provision for the ordinary affairs of life. A large proportion of the less satisfactory casual labourers and unemployed men and women are probably to be placed in this section.

Besides the feeble-minded, there are also actual lunatics and moral imbeciles, the sufferers from epilepsy and hysteria, and others who sometimes appear to recover their normal senses at certain periods of their lives, but are never free from the danger of a fresh outbreak. These people, of varying mental state, are in many ways more

dangerous to the community than people who, having a very low standard of intelligence, never depart far from their accustomed level of doing and being.

With regard to insanity, and also occasionally in cases of feeble-mindedness, as with tuberculous disease, the two factors of inheritance and environment have to be considered. These mental defects occasionally may arise from injury before or after birth, from certain constitutional and infective diseases, and from other specific causes, such as lead-poisoning. Again, insanity may be brought on by worry, anxiety, or by alcoholism. Still, in all these cases, where the effect of some outside agent can surely be traced, it is necessary to inquire what predisposition there has been in the family to mental derangement, for neither worry, anxiety, nor alcohol will drive the large majority of people off their heads.

Dr. Mott, for fifteen years pathologist to the London County Asylums, has devoted close attention to the importance of the "inheritance" factor, and sums up his conclusions as follows: "Leaving out of account those cases which are admitted to the asylum on account of (1) general paralysis of the insane, which is an acquired disease due to the late effects of infection by a specific organism, (2) organic brain disease (arising) from old age, arterial disease, softening and tumour formations, and (3) true alcoholic insanity with dementia, the main cause of the admissions to the asylums is an innate (hereditary) predisposition to insanity."¹

This opinion has been formed not only as a result of long hospital and asylum practice, but also on a comparative study of the records of some four thousand post-mortem examinations of persons dying either in a general hospital or in a lunatic asylum. There were far more deaths from the results of alcoholic poisoning in the hospital than in the asylum, and the conclusion reached was that most of the hospital patients had inherited a stable mental organisation which enabled

¹"Heredity and Insanity," by F. W. Mott, M.D.: *Eugenics Review*, Jan. 1911.

them to drink to excess, without seriously affecting their brain power, while the lunatics, coming from mentally weak stocks, were usually certified as needing asylum treatment long before alcoholic poisoning had had the chance of showing itself physiologically in a pronounced form. It appears likely that chronic drunkenness in several succeeding generations will of itself lead to a degenerate type of children, but even this effect depends largely upon the original character of the stock. Moreover, in good stocks, chronic drunkenness in several succeeding generations does not occur.

Insanity is found to be prevalent among such particularly temperate and clean-living people as the Quakers and Jews, where it must probably be attributed to a long habit of intermarriage of tainted stocks. The inheritance of insanity is more marked on the mother's than on the father's side, and occurs with greater frequency between brothers and sisters than between parent and child. Daughters are more often affected than sons. There is also a strong tendency for brothers and sisters of the same family to become insane at similar periods of their lives, and only a slight one between parents and children.

The predisposition to suicide, usually accounted a form of mental derangement, also runs in families, sometimes to the extent of determining the particular form of self-destruction—whether by shooting, drowning, or poisoning. In a family where four generations were known, three members in successive generations attempted suicide by cutting the left arm, and five members were inmates of asylums. Other pedigrees of mentally diseased stocks illustrate the connexion between insanity, suicide, and attempts to murder.

The tendency to suicide, which is frequently present in families with an insane taint, shows that, left to herself, Nature would have her own methods of bringing the diseased stock to an end. Members of families subject to recurrent attacks of insanity, who are occasionally under control and occasionally set at liberty

during their lucid intervals, seem to be the most effective breeders of future lunatics and paupers.

The feeble-minded form a separate class of mentally infirm persons, in that they have no periods of apparent recovery, and remain throughout their lives on whatever level of intelligence they chance to have been born. Perhaps their most common characteristic, to whatever sphere of life they belong, is to sink socially, to associate by preference with their inferiors, and to frequent the company of low and immoral persons. This is probably only an effect of the natural instinct of nearly all people to make friends, as far as possible, with people of much their own mental qualifications. The feeble-minded are easily influenced, and are very ready to receive suggestions, either good or bad, so that they soon fall a prey to designing persons. It is not difficult, by due preventive measures, to ensure that they shall not drop into bad habits; but, once they have joined the criminal classes, it is extremely hard to reclaim them, as they are incapable of understanding the moral aspect of their conduct.

Since the passing of the Inebriates Act of 1898, it has been possible to make some more accurate observations on the connexion between alcoholism and feeble-mindedness. A rough estimate shows that from 60 per cent. to 70 per cent. of the drunkards dealt with by the police are also mentally defective. These people, when controlled in homes, are often quiet, amenable, and good workers, but they can rarely be reformed. They are not true drunkards, for they do not suffer solely from a craving to drink. Their drunkenness is only one form of evidence of their feeble-minded condition; they cannot understand the value of sobriety, nor resist the first temptation of any sort that comes across their path.

If drunkenness be the besetting sin of feeble-minded men, the tendency to lead an immoral life is the most frequent failing of feeble-minded women. Indeed, with their lack of mental power and inability to control themselves rationally, some form of immorality is probably

inevitable if such women be left uncontrolled. Even at the early ages of eleven and twelve, feeble-minded girls sometimes show a marked tendency to immorality. Thus, to study this particular form of mental defect, as it presents itself in women, there is no more satisfactory method than to become acquainted with the working and with the inmates of rescue homes, penitentiaries, and the maternity wards of workhouse infirmaries, all of which institutions are provided for the purpose of affording occasional shelter and assistance to persons of this class.

At present feeble-minded girls may be detained by the public authorities up to the age of sixteen, and receive such care and training as can be provided in special schools or industrial homes; but after sixteen years of age, unless they are certifiable as idiots or lunatics, they are set at liberty.

Feeble-minded women, whether married or unmarried, are remarkably fertile. The workhouse records frequently note that five, six, or seven children have been born before the mother is twenty-five years of age, and she herself may have commenced child-bearing at fifteen years of age or even younger. Most of these children inherit the mental condition of their parent, and where both parents are known to be feeble-minded, there is no record of their having given birth to a normal child. In one workhouse there were sixteen feeble-minded women who had produced between them one hundred and sixteen children with a large proportion of mental defect. Out of one such family of fourteen, only four could be trained to do remunerative work.

With regard to the fertility of feeble-minded stocks, it has been pointed out that the feeble-minded children from the degenerate families, who use the special schools in London, come, sometimes two or more at a time, from households averaging about seven offspring, whereas the average number of children in the families who now use the public elementary schools is about four.

It is very difficult to get any accurate information as

to the probable amount of mental defect existing in a population like that of the British Isles, or to make any reasonable forecast of its rate of increase in present conditions. The number of certifiable lunatics under detention in any one year is definitely known, as also the number of criminal lunatics supported by the nation. But with regard to lunatic asylums and private patients, no record is kept of the number who have been discharged as temporarily cured and are to be found merged in the general population. There are about one hundred and fifty thousand certified lunatics and idiots, and probably about the same number of persons who are definitely feeble-minded, besides many individuals who, without any clear mental infirmity, are nevertheless of a low grade of intelligence, and would be likely to produce feeble-minded children. It seems possible that one person out of every hundred throughout the country will fail to be self-supporting on account of some sort of mental defect, and, as long as lunatics are freely discharged in their lucid intervals, and feeble-minded people are cared for by methods which encourage them to produce and rear their numerous offspring, it can be stated confidently that the number of persons afflicted with some sort of mental disease or brain malformation will show a steady annual increase.

(b) *The Inheritance of Ability.*

Attention has already been called to Galton's work on the inheritance of ability, which was the first attempt to make a statistical inquiry into the subject. Biometric methods have also been applied, and the honours class lists of the Universities have been subjected to careful analysis by Professor Pearson and his school of investigators, with results that have been indicated already. The absence of records makes it almost impossible to trace the descent of specific abilities, other than those that bring distinction in the worlds of politics, literature, art and science; but there is no doubt that skill in many crafts and other professions, such as those exercised by

shepherds, masons, instrument-makers, huntsmen, etc., follows the same lines of descent as mathematical ability or administrative power. Indeed, many forms of craftsmanship and outdoor occupation require the conjunction of some definite mental bias or intuitive instinct with the appropriate physical strength and deftness of hand and eye ; and, if the lines of inheritance could be traced in full, the investigation might yield valuable information as to the correlation of certain mental and physical qualities.

One of the principal difficulties attending an inquiry into the inheritance of mental ability is the great problem of obtaining an independent estimate of the degree of ability which should suffice to attract attention. Class lists of examinations, drawn up for an entirely different purpose, do eliminate the risk of misdirection, owing to some personal bias of the investigator, and the same effect is obtained when use is made of a work like the *Dictionary of National Biography*, which was compiled without any reference to theories of heredity.

There are many kinds and degrees of ability in a nation, and, in studying individual family pedigrees, it is as instructive to deal with mediocre talents, rising occasionally to the third or second rank of eminence, as with families of historic interest, whose members have constantly reinforced the ranks of the makers of history. Various pedigrees, embodying, in some cases, the attributes of five or six hundred persons, have been published by the Galton Eugenics Laboratories.¹ Out of a family group of such large numbers, two or three individuals may be well known throughout the country, twelve or fifteen may occupy positions of eminence in local affairs, in legal or commercial pursuits, in scientific, literary or artistic circles, and another twenty or thirty may be leading useful and uneventful lives, which place them somewhat higher in the scale than the average of their normal companions. Almost every large family will produce its few failures, who are sinking in the social

¹ *Treasury of Human Inheritance.*

scale, and its occasional black sheep, whose presence not infrequently can be accounted for as the effect of some far-off ill-considered matrimonial alliance. Such records must needs remain impersonal, as far as actual names are concerned, since it is impossible openly to place on record or to criticise either for good or evil the achievements and attainments of persons who are now living, or are but recently deceased. To introduce openly the personal element, it is necessary to deal with individuals of extended fame, of whom records may be found in published works, and to drop the inquiry at a respectful distance from the present day.

An analysis of part of the *Dictionary of National Biography* on these principles has been attempted by the present writers,¹ the period taken being 1720 to 1820. A notice of more than twenty lines in the Index Volume was accepted as proof of eminence, while inclusion in the *Dictionary* was taken as defining ability.

The results showed that men of eminence who gained peerages or belonged to families possessing peerages, where the type of ability is mainly political or administrative, had an average of 4.5 "able" relatives, while other eminent men, whose ability was chiefly of other kinds, had but one "able" relative apiece. Reasons are given for believing that family influence is not enough to explain these figures, and that the theory that administrative ability alone is hereditary is not justified. The chief cause is found in the facilities for suitable marriages possessed by the aristocratic class, where a social circle in which much administrative ability is segregated lies ready to hand. This view is borne out by the fact that, in the first group, the families of both parents of the eminent man were equally prolific in able relatives, whereas in the second and much larger group only six relatives of distinction altogether were to be found on the mothers' side. The members of the first class are thus more likely than others to choose mates with qualities

¹"Eminence and Heredity," *Nineteenth Century and After*, May, 1911.

similar to their own—or at all events were likely to do so during the period under review. Their characteristic administrative ability, then, was more often preserved from generation to generation than the literary, artistic, or scientific ability, which usually seems to arise by chance in other classes.

It is greatly to be desired that more work should be undertaken on the inheritance of specific forms of mental ability, throughout the various sections of the nation. Unfortunately, from the point of view of the investigator, great ability, unlike marked mental defect, cannot be certified by a medical officer, so that it is difficult to obtain a standard which will be acceptable to all inquirers. Moreover, an able man usually requires a far longer period of life to make his characteristic impress than does his afflicted fellow-citizen; and unfortunately there are very few families who keep records of sufficient length and detail to provide adequate material for an exhaustive study even of one case of the inheritance of mental ability.

CHAPTER III

THE METHODS OF RESEARCH

1. Vital Statistics.

It is only within quite recent years that the governments of civilised countries have paid any attention to problems of population. An occasional count of the actual number of persons existing in the land on a certain day represented the extent of their inquiries. Gradually, however, further details have been required, such as age and occupation; and, in the last British census of 1911, questions were asked concerning the number of children born to each married couple, the number of blind persons, and the existence of persons thought to be mentally defective. Thus the decennial stocktaking of the nation is becoming more thorough and intelligent.

But the census, occurring as it does, only once in ten years, is at best only a rough method of estimating movements of population. In some respects the annual report of the Registrar-General of Births, Deaths and Marriages is a more effective means of gauging the vital conditions of the country.

The actual increase of population is not difficult to ascertain; it is only necessary to subtract the number of deaths and to add the number of births, to make due allowances for emigration and immigration, and the correct answer can be obtained. Thus in 1909, the natural increase of population in Prussia was about fifteen per thousand, in Italy, Scotland, England and Wales about eleven per thousand, in Ireland about six per thousand, while in France the number of inhabitants was practically stationary. Indeed, during the first half

of 1911, the deaths in France exceeded the births by about eighteen thousand.

The relation between the birth-rate and death-rate has an importance far beyond the fact that the actual number of the population can be calculated from it. A decrease in the death-rate means that more people are living to a greater age, and probably exceeding the limit of years to be assigned to remunerative employment. A decrease in the birth-rate indicates that fewer young people are being born to support them and to carry on the work of the nation; it is a process of which the effects do not become appreciable until after the lapse of twenty or thirty years. The decline in the birth-rate might conceivably continue until no births occurred; the decline in the death-rate must reach a point at which a further decrease is impossible. In France a condition of equilibrium has been established, and, should the decline in the birth-rate continue, it is possible—in theory, at any rate—that the nation should gradually vanish off the face of the earth.

A consideration of the birth-rate alone shows that a decrease occurred in England, Wales and Scotland, from 35 births per thousand in 1870 to 26.5 per thousand in 1910, and the decline continues uninterruptedly. Ireland needs separate consideration, on account of the large continued emigration of young persons in the prime of life, and consequent reduction in the proportion of married women of child-bearing age. When this correction is made, the true birth-rate for Ireland in 1901 would be 36 per thousand, while for England and Wales, in the same year, it would stand at 28.4. Indeed, taking the corrected birth-rates of the principal countries of Europe and the Australasian colonies of Great Britain, Ireland alone shows a slightly increased fertility. Japan, which is the only oriental country keeping records on the European system, shows a very pronounced increase in the birth-rate.

It is also possible to study the corrected birth-rate of the towns and counties of England, from figures published

by the Registrar-General. The highest country birth-rates occur in Monmouth and Shropshire, with 34 and 33 per thousand respectively; the lowest in Sussex and Devon, each with 25. London gives 26, Manchester 29, Liverpool 30, Edinburgh 28, Dublin 35; Berlin has 22 and Paris 16.7 per thousand. There is no effective registration of births in the United States of America, so that it is impossible to obtain thence any figures for comparison, but it is probable that the large towns have a corrected birth-rate of about the same order as Paris or Berlin.

It is not easy to assign the actual causes to these great differences in the birth-rates of civilised nations and of different districts of the same nations, though later on some attempt will be made to deal with the problem. Any examination of the birth-rates of different sections of the communities, classified otherwise than geographically, is extremely difficult, though the last census, which took note of the profession of the father and the number of children resulting from any marriage, should produce ultimately some very valuable information.

Taking the various districts of London, where people are massed together to some extent according to poverty or wealth, it is found that the corrected birth-rate of Bethnal Green—the district of London where fewest servants are to be found—fell off by twelve per cent. between 1881 and 1901; while that of Hampstead—where many domestic servants are kept—was reduced by three times that amount. In Whitechapel and Mile End Old Town, where half the marriages are celebrated according to Jewish rites, the birth-rate still stands at 30 per thousand. This figure may be compared with the birth-rate for Roman Catholic Ireland and Dublin, and bears witness to the existence of some religious factor having a profound influence in determining the composition of the future population of the British Isles.

The records of the Friendly Societies have also been examined.¹ As an example, the great Hearts of Oak

¹ *The Decline of the Birth-Rate*, by Sidney Webb, Fabian Tract, No. 131, London, 1907.

Friendly Society, with a membership of over a quarter of a million of citizens and skilled mechanics, paid "lying in" claims for the wives of its members at the rate of 2472 per thousand in 1880, and fell to 1165 in 1904, showing a decline of births in a class picked for the desirable qualities of permanent employment and thrift, amounting to more than one-half. This fall is three times as great as that shown by the total returns of England and Wales for the same period.

Study of a complete *Peerage and Baronetage* shows that the aristocracy and landed gentry of England reduced the average size of their families from seven children in 1840, six in 1860, four and a half in 1880, down to three in 1890, and it is probable that the reduction still occurs.¹ From such books of reference as *Who's Who?* which give details of the upper official, professional, and commercial classes in which a large proportion of certain types of ability are concentrated, it has been ascertained that marriages before 1870 gave an average of five children (living at the date of issue—1906—of the volume) to each fertile couple, and that marriages contracted after 1870 only produced three children apiece. Among the clergy, however, the later marriages still produced an average of over four children, again pointing to the influence of religion on the number of births.

2. The Employment of Women.

The employment of women is probably a factor of great importance in determining the birth-rate of a district. In towns and other areas where many married women are engaged in manual labour, such as in places where textile industries are carried on, the birth-rate is abnormally low. On the other hand, in mining and in some agricultural districts, where there is little remunerative occupation to tempt women away from their homes, the birth-rate remains comparatively high,

¹ *The Family and the Nation*, by W. C. D. and C. D. Whetham (Longmans, 1909).

in spite of the fact that in one case the wages earned by the men are in excess, and in the other case greatly below the average weekly income of the industrial sections of the population.

In the same way, among many sections of the upper classes, the increasing tendency of the women to find interest, occupation, or amusement in social, political, educational, or athletic pursuits has resulted in a strict limitation of the family. Nowadays it is very rare, even among the well-to-do, to find a married woman, who has many distractions outside the home, with a normal or even with the necessary (from the national point of view) family of four children and upwards. This fact throws much light on the psychological problems which underlie every question relating to the employment of women, whether it be in industries, or in administrative or educational occupations.

For the welfare of the race, then, it is important to study these problems and to foster all industries and spheres of work, in which men of skill and competence are employed at wages sufficient to maintain a family in comfort, according to their several stations of life; and to remove as far as possible any temptations to drive women, and especially married women, into the wage-earning category.

3. The Problems of Population.

From the facts and figures already given in this chapter, it is clear that the office of the Registrar-General will gradually become the central agency in the country for determining the rate of increase of the population as a whole, the increasing proportion of aged persons, the decreasing birth-rate of the different sections of the people, and other factors which are of vital importance to the nation in forecasting its future development. As Galton pointed out, the composition of our race is not fixed, and if any section establishes a predominant fertility, its qualities and apparently its religion, whether good or bad, will soon permeate the mass of the people, and effect profound changes in the social and political

outlook. The real heart of all problems of civilisation is to be sought in the *quality* of the population. To take a sentence from the Census Report of 1851: "The *character* of every race of men is the real limit to its numbers in the world, if allowance be made for accidents of position and time." Were the whole people of England gradually to become feeble-minded, or even to be changed into unintelligent casual labourers, the existing means of transport and subsistence would be destroyed, or allowed to fall into decay, and the population would be reduced by famine and disease to the mere handful who could snatch a living from the wreck of our civilisation. However, long before such a state of affairs had been reached, it is certain that this country would be rightfully appropriated by some nation possessing a higher standard of mental and physical ability. From considerations such as these, it is easy to understand what importance must be attached, firstly, to a correct estimate of the value of various racial qualities, and secondly, to a knowledge of the degree to which social conditions are helping or hindering their growth.

4. Medical Inspection of School Children.

A new national agency has been established in the last few years, which should prove of great assistance to students of Eugenics. The medical inspection of elementary school children was first undertaken in 1906, and, though no efforts have yet been made to look beyond each individual child, it is only a question of time for the subject of the influence of the hereditary factor to be taken into account; because, for instance, quite different methods of treatment and after-care are desirable for a child whose condition is due to adenoids, producing deafness, and for one who comes from a constitutionally deaf family. Again, excitability or undue fatigue, caused by mischievous home surroundings or half-time labour, require other remedies to be sought than a similar condition brought about by some definite mental disorder, prevalent in the stock to which the sufferer belongs.

The value of the report for 1910 by the chief medical officer of the Board of Education cannot be overestimated. It is a national document of the highest importance and most profound significance. There are about six million children attending the elementary schools of England and Wales. Of these children, the medical inspection reveals that about 10 per cent. show serious defects of eyesight, from 3 to 5 per cent. are deaf in various degrees, while 1 to 3 per cent. suffer from discharging ears. Surgical treatment is required in from 6 to 8 per cent. to remove adenoids, enlarged tonsils, and other obstructions to free breathing, and about 40 per cent. suffer from decay of the teeth sufficiently severe to injure their general health. From 30 to 40 per cent. have unclean and verminous heads and bodies, 1 per cent. are attacked by ringworm, and another 1 per cent. have tuberculous disease in an advanced state; nearly 2 per cent. show symptoms of heart disease, and a large proportion are enfeebled by improper or insufficient feeding. Thus, not counting the last section, consisting of ill-nourished children, something amounting to over one hundred per cent. of defects are noted, which are responsible for a condition of health calling for medical treatment. It is certain that many children must be suffering from several disorders at once, and it is not clear what proportion can be accounted to be in a perfectly sound physical state of health—probably only a relatively small number; although it is suggested that not more than half the entire number, that is, not more than three million individuals, require urgent attention.

In a smaller report—that of the Cambridge medical officer—it is definitely stated that only ten per cent. of the children were free from serious defect.

Such results are most disquieting; the remedy is not clear.

“It must be remembered,” writes the medical officer to the Board of Education, “that treatment is not infrequently a difficult, prolonged and complex process. The effective control of many of these maladies depends upon

a series of conditions brought to bear upon the whole life of the child. It is incumbent, in fact, that the hygiene of the home and school, in its broadest sense, should be linked up with the more strictly medical treatment."

These reports disclose a state of affairs which is hardly creditable to a civilised nation. The first impression received on reading them is that incredible stupidity and negligence must rule in a great number of the homes, where, after all, the responsibility for the welfare of the children should naturally rest. But the parents themselves have all recently passed through the elementary schools of the country, and it is therefore largely to the defective nature of the education and training that they themselves received therein that some proportion of this national reckoning of suffering and disease must be attributed. It may be too late to do much for the children of to-day, but when they in their turn become parents, the education authorities have only themselves to thank if the conditions of child life at home are not markedly more healthy and intelligent. Certainly, as regards the education of girls, a determined effort must be made to secure profitable instruction in the things that are essential to a satisfactory home life.

Finally, and most important of all, it is necessary to investigate how much of this load of misery and defect is due to bad conditions in the homes, and how much to definite hereditary qualities, which can only be bred out of the race by some form of selective parenthood.

5. Royal Commission Reports.

There are other official sources of information relating to the welfare of the nation which cannot be overlooked. The reports of several recent Royal Commissions have provided valuable stores of facts, and, although the Committee on Physical Deterioration did not produce any definite conclusions, it probably opened the way for the system of medical inspection of the school children. The Commission on the Care and Control of the Feeble-

Minded reported emphatically in favour of both care and control in suitable homes, not only in childhood, but throughout life, as the only way of securing a safe and fairly happy existence for these unfortunate beings, and ultimately of relieving the nation from the charge of an increasing number of degraded and unprofitable citizens. No steps have as yet been taken to give effect to their urgent recommendations.

The Royal Commission on the Poor Laws issued in 1909 a report of very great interest, and much of the evidence collected by them must be considered by students of Eugenics. The following sentences may be taken from the summary :

“ It is very unpleasant to record that, notwithstanding our assumed moral and material progress, and notwithstanding the enormous annual expenditure, amounting to nearly sixty millions a year, upon poor relief, education, and public health, we still have a vast army of persons quartered upon us, unable to support themselves, and an army which in numbers has recently shown signs of increase rather than decrease. To what is the retrogression due ? It cannot be attributed to lack of expenditure ? . . . The statistical review of the expenditure incurred and of the results attained by it prove that something in our social organisation is seriously wrong, and that, whatever may be the evils, they are not of such a nature as to be improved or removed by the mere signing of cheques or the outpouring of public funds.”

The problem of national pauperism is one of pressing importance, and certainly depends far more on the inheritance of human faculty than has yet been recognised. About fifteen thousand births take place annually in the workhouses of England and Wales, of which two-thirds are illegitimate. Now, in one workhouse, the commissioners found that, out of 229 births in five years, in rather over three-quarters of the cases the mothers were mentally weak, in most cases approaching the state of imbeciles. Even with all the resources of modern

medicine, many of these children will not be reared. Of those that survive, a large proportion will be feeble-minded, and many of the remainder will probably prove unemployable, in that they have neither the will nor the capacity to undertake steady work.

6. Pauper Pedigrees.

A committee was formed by the Eugenics Education Society in 1910 to see if investigation into individuals and families, coming within the sphere of Poor Law action, would throw any further light on the problems of pauperism. It is necessary to distinguish, for instance, between widows and children, bereft of their livelihood by the death of the bread-winner of the family—who in no ordinary sense can be termed paupers—and the families of the work-shy and degenerate parents, who have never honestly done a full week's work in their lives. It may be necessary, from the point of view of administration, to deal with both these classes by means of one agency; but from the scientific point of view, there is a profound difference of classification.

It is to the element in pauperism which represents and hands on some original inborn defect of body or character that the committee turned their attention, and their report,¹ though but a tentative one, is a good instance of the result of the introduction of scientific method into problems of race and social welfare.

“It cannot be emphasised too particularly that the only reliable and scientific method of dealing with the grave problem of pauperism is to be as complete, as detailed, and as personal as possible in every case dealt with. The circumstances of the life of every person in the pedigree of a pauper, both those directly and collaterally related, should be ascertained as fully as can be.”

As the result of the application of this principle of research, several broad features could be seen at once. First among them is the fact that one pauper family has a tendency to marry into other pauper families. In

¹ *Eugenics Review*, Nov. 1910, Poor Law Number.

all ranks of life, with ability as with mental defect, like inclines to marry like, and like then breeds like, thus keeping together and intensifying the special characteristics of any section of the community. Secondly, the evidence is clear that successive generations of the same family each contain their due proportion of paupers. This result points to the conclusion that such pauperism is due to inherent and inborn defects which are hereditarily transmitted. Thirdly, the committee were impressed by the fact that many of "the paupers whom they have seen and examined individually, are characterised by some obvious vice or defect such as drunkenness, theft, persistent laziness, a tubercular tendency, mental deficiency, deliberate moral obliquity, or general weakness of character, manifested by want of initiative or energy or stamina." The prevalence of a type of people with low foreheads and uneasy, shifting glances is also noted.

A great number of family histories were collected, and many pedigrees were published. When it is possible to trace four generations of paupers, the existence of the hereditary factor receives most convincing confirmation. It was also possible to trace as many as four generations of illegitimacy, accompanied throughout with maintenance by the community.

Let us describe two average specimens of the results obtained. Out of a family of twelve children, of whom four were dead, two were in industrial schools and one was in the workhouse. Both parents were paupers, all four grandparents, and, in addition, three uncles, one aunt, one aunt by marriage, three great-uncles and one of their wives, and two great-aunts were kept at the public expense. Another branch of the same family gave the following results: An imbecile child was found in the wards of a workhouse infirmary; its paternal grandfather's brother was a lunatic, the mother's father was an insane epileptic, her mother was consumptive, her maternal grandmother was probably consumptive and certainly a pauper, while the mother herself was illegitimate and subject to fits.

The biological factors accompanying unemployment were also examined. In a general sense, though of course many exceptions were noted, the able-bodied unemployed represented the weaker stocks. When there is less work, the least competent are the first to be discharged. This state of affairs is complicated by the question of age. Workmen's Compensation Acts have produced employers who are keenly observant of the mental and physical capacity and defect of their work-people, and for the failing fitness of the older men. The standard of employable labour that can safely be handled has risen; a higher degree of mental alertness is necessary, and the person who falls short of the requirements becomes a casual worker, liable at any time to drop into the ranks of the unemployed, when low conditions of living serve to increase the physical and mental weakness which has brought about his descent. In his classification of poverty Mr. Charles Booth shows that at least three degrees of necessitous persons never have any industrial status, and probably can never acquire it under any conditions. It is from these sources that the rate-aided, "able-bodied" pauperism is mainly derived.

It will be seen from the short summary given above that a very good case has been made out for inquiry into, and consideration of, the hereditary aspects of pauperism before any great alteration is made in the English Poor Law system. "To aim at economic change, without seeking to change the quality of the human element, is to waste good energy to no purpose."

7. Criminal Statistics.

Two other official sources of information may be mentioned. In the first place, there are the Judicial Statistics and the Annual Report of the Prison Commissioners. These two documents should be read one with the other. The Judicial Statistics report an increase and the Prison Commissioners a decrease in the crime of the country, a difference of opinion which, at first sight, is apt to be misleading. It is accounted for, however, by the fact

that the one takes notice of all persons who are brought to trial and found guilty, whether any punishment be inflicted or no, while the other is a record of the number of persons who are reserved for punishment by detention in prisons. The difference between the two is probably a measure of the degree of leniency with which it is becoming usual to treat certain classes of offences. Both reports agree in noting an increase in serious crime, and both emphasise the ineffectiveness of the present methods of punishment on the habitual offender. Short sentences of penal servitude have little or no curative effect on the old and hardened criminal, but long periods of detention under the Borstal system, where systematic training in handicrafts forms part of the treatment, seem to give fairly satisfactory results in the case of many young people. A large proportion of the population of the prisons might be divided into two classes: one that ought never to be put into a prison, and the other that ought never to be let out.

8. Immigration and Emigration.

The second official source of valuable information, which is as yet hardly considered in forecasting the future of the nation, is to be found in the meagre notes supplied by the Emigration and Immigration bureaus. In a general way, it is known how many persons of each sex annually leave the shores of England for the Colonies, and in the same way, the number and place of origin of the incoming tide of humanity is approximately ascertained. There is a movement of about two hundred thousand persons annually in each direction, the figures for emigration being just at present in excess of those for immigration. A large proportion of the emigrants go out prepared to dwell upon and develop the virgin lands of Canada and Australia; practically all the immigrants settle down in the most crowded quarters of the great towns, especially of London. The Colonies exercise a considerable amount of supervision on the health and social status of the families they admit, rejecting the

mentally defective, the consumptive, and the pauper. No such process of exclusion is applied in England to the alien immigrant, who comes chiefly from the most populous and miserable districts of Eastern Europe, except some ineffective attempts to keep out the more notorious criminals.

If the departments concerned were to collect and keep a record of the antecedents of each individual leaving or settling in this country, and, like the Colonial authorities, were to institute some sort of inquiry into the physical and mental condition of the persons with whom they have to deal, there is no doubt that the information obtained would be of great value.

The effects of cross-breeding between two races are known to give very varied results—to wit, the unsatisfactory half-bred populations that have arisen in South America; and no biological inquiry has yet been set on foot to ascertain the probable racial value of an Anglo-Slavonic hybrid stock.

9. Factors in Environment.

In any branch of Eugenics where the effects of environment play an important part, great caution and most thorough and searching inquiry are necessary before any conclusions can safely be drawn. The number of factors that influence the problem is far larger than would be suspected from a superficial survey of the subject. For instance, an attempt has been made to ascertain whether the employment of women in any capacity does influence appreciably the mortality of their offspring and the health of their surviving children. This problem is of course quite separate from the one that deals with the effect of the employment on the *number* of their offspring, also a subject of great importance, with which we have already dealt. With regard to the first question, opinions are freely given to the effect that the employment of women is necessarily injurious from the point of view of the health of the rising generation; but, when very careful inquiries are made, dealing with large numbers

of women occupied in a multitude of ways, a great many other causes are found to have as pronounced an effect as the actual fact of employment. Thus it turns out that the mother's age, the father's occupation, the cleanliness of the house and the family milk-jug, the use of india-rubber "comforters" for the babies, are all of as much importance in determining the death-rate of infants as the mother's work, though again, in the matter of cleanliness, the question of the mother's absence has certainly an additional indirect effect.

A striking example of indirect causes was seen during the great Lancashire cotton famine at the time of the American Civil Wars, when a marked reduction occurred in the infant mortality of the districts affected. The saving of life, really due to the enforced presence of the mothers in their homes, might be wrongfully attributed to the scarcity of food, and an entirely incorrect value for the racial benefits of partial starvation might be deduced therefrom. Again, during the strikes in Liverpool in 1911, there was a great rise in the infant mortality. Part of this increase—to an extent which can be calculated from the corresponding death-rates of neighbouring places—was undoubtedly due to the exceptionally hot weather of July and August. The remainder must be attributed to the effective wrecking of the food and fresh milk supply and the disorganisation of the sanitary service of the town. The increased death-rate occurred chiefly in districts occupied by the strikers, and consequently the deaths of some five hundred children, besides a proportion of the increased general death-rate, and of the two of three persons killed in the efforts to restore order, must be added together before the precise eugenic effects of a general strike can be ascertained correctly.

A study of the influence of the biological or hereditary factor in normal cases of infant mortality has also been set on foot. In certain districts of large towns, where the conditions as to wages and housing are identical, there is a large divergence in the rate of infant mortality as between house and house. One family will lose eight

out of ten children, while next door a large number of children are reared in excellent health. The factor of environment, as regards soil, water supply, drainage, housing and school accommodation, is the same in both cases; it therefore remains to discover whether the mortality is due to the ignorance of the mother, or to some fundamental superiority of the one stock over the other.

10. Results.

In considering the possibilities of the use of scientific methods in Eugenics, it is necessary clearly to realise the limitations imposed by the fact that direct experiment is not possible in the case of the human race. Observation, the keeping of careful and accurate records over long periods, notes and deductions made by skilled workers, form the only agencies through which advance can be made. Human nature, left to itself, is making all the necessary experiments with a reckless disregard of consequences which would be termed either splendidly heroic or monstrously criminal—according to temperament—should such courses be entered with the deliberate intent of extracting therefrom knowledge which would be profitable to future generations. A few, a very few, definite results have as yet been obtained during the years in which organised research has been in progress, and, except in the case of the feeble-minded, where state interference is glaringly overdue, probably in the case of hopeless habitual criminals, and possibly in the case of sufferers from certain types of blindness and deaf-mutism, there is no direction in which, as yet, general interference would be justified.

Still, facts are being accumulated in the various laboratories of the world; and, especially in the United States of America and in Germany, great attention is being paid to determining and analysing the various inborn and heritable qualities of the human race. In England, the new Galton Eugenics Laboratory in connexion with University College, London, for some time will be the

centre of work. Already the laboratory is consulted freely by medical officers of health, by school medical officers, and by independent medical men who themselves have not either the opportunity or the necessary training for dealing with the various problems. During the last few years, the staff already at work in their temporary rooms have given help and advice to a very large range of government departments, British and Colonial, to municipal authorities, and to private individuals, and have at their disposal information which, without an increase of assistance, will take them some time to analyse and prepare in a form in which it can readily be used.

In matters affecting the inheritance of obscure and rare diseases, it is clear that the most valuable information must be gained through medical men, who, indeed, are daily becoming more alive to the importance of this side of their professional duties. Gradually, too, every county lunatic asylum will have its research laboratory and its keeper of family records, whereby the present haphazard system of treatment and of admission and release will be based on some reasoned form of procedure.

But if as yet there is little absolutely sure ground on which general measures could be advised in the interests of society, there is a very great deal of knowledge that can be placed at the disposal of any individual, who possesses a conscience in such matters. A few things are absolutely sure, and others come within the range of probability. Probability is, indeed, at the foundation of Eugenics, and if objection be made that it is an insecure footing, it may be urged in reply that the whole course of a man's existence is an affair of probability, and that all the great life insurance companies—nay, even the Chancellor of the Exchequer himself—flourish on a like principle.

The instances where certainty can be given occur in cases where inheritance on Mendelian lines has been definitely proved. Any person coming from stock liable

to produce deaf-mutism—which acts as a recessive—whether he himself be deaf or no, may transmit the condition to any, or to all of his children and he greatly increases the chances of so doing should he marry a blood relative of the same stock or a person coming from a similarly afflicted family. On the other hand, a person belonging to a brachydactylous (deformed hand) stock—of which but very few families are known—does not transmit the deformity unless he himself possesses it, in which case he will transfer the peculiarity to about half his children. Brachydactyly acts as a Mendelian dominant, and can only be handed on by persons who are themselves affected. Here are two perfectly definite instances of two different forms of descent. A few tendencies to disease and other infirmities have also yielded clear results on the same lines, by which any one would be justified in allowing himself to be guided. And for the general public there is no more sure axiom than that like tends to breed like, whether in physical or mental characteristics, and that men do not gather grapes of thorns nor figs of thistles.

CHAPTER IV

THE CONSTRUCTION OF SOCIETY

1. **Biology and History.**

There are two ways of studying the more complicated aspects of life. It is possible to take a small portion of the whole, examine it critically in its statistical aspects, its biological aspects, weighing one individual against another—putting the human material of which society is constructed under a microscope, as it were, and from minute observations to endeavour to put together a plausible theory of the larger movement of life; for that there is a movement of life, now backwards, now forwards, now in one direction, and now in another, is manifest to every student of history and every observer of human affairs.

Another way of attacking the problem is to take as wide a view as possible, to deal with the population of the world as a whole, study in broad outline the inborn differences of race, note the variations of type in the climatic belts of the earth's surface, let nations rather than classes be the sub-divisions, and tribes rather than families the units. Then, having discovered how Nature works on her largest scale, to reduce the field of vision, and see how far the principles, which appear to hold good in the more extensive outlook, can be applied to smaller variations and less marked divergences.

The one method is the work of the laboratory and the statistician, which has already been considered, the other of the votary of the open field and the historian of past ages. Both can be used with advantage by the student of Eugenics. The pursuit of the biological factor in

history will prove at least as illuminating as in any other department of social inquiry.

A survey of the races of the world as a whole reveals their profound diversity of appearance, of endowment, and of achievement. Differences which have slowly developed by different courses of natural selection under the influence of different surroundings are no longer subject to alterations by environment, acting within measurable spaces of time. To interchange the negro of Central Africa and the esquimaux of Greenland is to destroy both of them. The bushmen of Australia and the hairy tribes of Arctic Northern Asia have little in common beyond the fewness of their needs and their small means of gratifying them. Great want or great plenty seem equally effective in depressing the standard of humanity. It is in the temperate regions of the world, where the stimulus to exertion exists, but where exertion and fertility of invention will bring an adequate reward, that the finest races of mankind have developed.

It is precisely this capacity for exertion and this power of invention and adaptation that enables vast populations now to live where once there were but a few roving tribes. To take a concrete instance: a group of sluggards and dullards will inhabit a tract of country and continue to exist and multiply as far as the natural resources of the land permit, will be ravaged at intervals by floods, decimated by disease, and carried off, protesting hopelessly, by wild beasts. Another group of men, placed in the same conditions, will till the land, drain the soil, direct the water courses, destroy the beasts of prey, and finally establish a large and prosperous community amid the once desolate surroundings. In a natural state of existence men of the second class will always succeed, supplant, and outnumber men of the first class.

In most of the tropical regions of the world, where vegetation is rampant and animal life flourishes exceedingly, there is apparently insufficient incentive to activity. The standard of intelligence required to maintain existence and to satisfy ordinary desires is of too low an order to

bring about any effective selective action in the direction of mental activity. In the same way, in snow-covered regions, or on bare waterless plains, the conditions of life are so arduous that the mere effort to support existence in any shape has taxed the human intelligence to the utmost. The finer qualities of mind and character, as we know them, have no survival value, and consequently, even throughout vast spaces of time, have not been evolved.

The animal world provides many like instances. The little rugged, slow, sure-footed pony of Iceland, Norway, or the Shetland Islands is the product of its surroundings. Over ground where speed is of no avail, speed has not been developed. In a climate where life cries aloud for warmth and protection, the long shaggy coat becomes part of the inheritance of its four-footed inhabitants. But over the steppes of Russia or deserts of Arabia and North Africa, speed is a quality of first importance and enters into the heritage of every horse. Very slowly and very surely, the natural environment of each type determines what that type shall be. Change the character of the surroundings, and those unfitted for the new conditions will gradually disappear, leaving the field clear for those who prove fittest to survive. But any expectation that types of life will suddenly alter with changing circumstances seems doomed to disappointment. Nature does not usually proceed by the method of sudden alterations, and the machinery for keeping pace with quick changes of circumstance is usually absent. The Shetland pony pines and dwindles in the warm stables of the smooth-coated race horse, who in its turn dies of exposure to the winds and rains which are the breath of life to its humble companion.

It is the principal characteristic of the higher races of man, dwelling in the temperate zones, that, to a certain extent, they have obtained a mastery over external circumstances, and have learned to mould them to their needs. Their exertions have met with sufficient reward to encourage further progress. As the social instinct

has grown, and the power of organisation has developed, man also has risen in the scale, and has learned to conquer obstacles and overcome many difficulties that lay in his path. The abler, more energetic man has established better conditions for himself and his family, and his offspring have inherited both his ability and the more favourable opportunities for developing it. The less well-equipped, less active individual has had a smaller chance of keeping a foothold for himself and his descendants, so that the progression of society has been undoubtedly due to the increase of the standard of ability and to the diminution in the number of persons who, generation by generation, were unable to contribute their share to the corporate welfare.

Now there are at least three ways of inheriting from the past, just as there are three ways of benefiting the future, and each one of them plays its essential part in determining the future racial qualities of the nation.

The first way is an affair of the family—the inheritance of definite physical and mental qualities, which, through the agency of suitable marriages, can be handed on, unimpaired, improved, or corrupted, to a long line of descendants. The second way is the concern of groups of families, of tribes, of classes of the people: each particular set of characteristics requires a slightly different environment in which to develop to the fullest advantage. The inheritance of environment in normal conditions of life is a very marked phenomenon, which has a real sociological meaning for men as for plants or animals. There is a natural grouping of men according to their endowments, and consequently according to their needs, and society, left to itself, will constantly make or improve the adjustments necessary to preserve the different standards of existence. These adjustments are heritable factors in healthy family life. The third method of inheritance is the transfer from generation to generation of the vast common store of experience, invention, and tradition which is the joint property of all the civilised nations, and yet differs profoundly in its aspects and

its applications as between nation and nation. Many nations have much in common besides eyes, noses and legs, and may have more, but it remains true that each one gives its own particular colouring to the elements which are held in common, and has other characteristics of religion, of social construction, of industrial aptitudes, which are probably as fundamental an element in its progression along the lines marked out for it as are the warm climate to the negro or the cool moist winds to the Shetland pony. Or, to take another simile, although it is certain that in the vegetable world oaks and beeches have a thousand points of likeness, and will live contentedly side by side, yet the oak will flourish best in a stiff, rich, clayey soil and the beech will spread itself with greater delight in the combs and dells of the chalk and limestone hills.

Every one draws in a greater or less extent on all these three sources of inheritance. The successful man, the man to whom his country owes a debt of gratitude, is he who can enrich all three for future generations. The parasites of society are those who take even a small quantity without the power or the desire to replace what they have consumed. Left to the forces of nature, such people tend to disappear; but it seems to be one of the dangers of a complex society, whether ancient or modern, that this class of persons tends to increase and gradually to destroy the common heritage of the whole.

One of the factors which immensely complicates the problems of modern civilisations is the increasing ease with which people are able to move about. There are compensating advantages in a greater facility of intercourse, of effective industrial organisation, of a more widespread community of interests. But the biological factor is little considered, and, moreover, its action is often so slow, requiring a generation or two to take effect, that it is difficult to estimate its real influence.

There is probably a real slight fundamental difference between a population that is best fitted to occupy a sea-coast area and take to itself the occupation of sailors and

fishermen, and one that can best flourish among mountains and highlands, and gain a livelihood as trappers and huntsmen or woodmen and shepherds. But with the altering forms of civilisation, with inevitable changes in economic pressure, with the greater ease of movement, many of these types leave the surroundings in which they were created, and find themselves ultimately in conditions where their special endowments are of no value, nay, are even a positive drawback to their future advancement. Much of the friction with which the social organism now moves may be due to this displacement of types, and to the difficulty of fitting persons, whose natural environment is rapidly passing away, into new conditions of life.

There is, for instance, much evidence to show that a small dark race is more fitted to survive in the fierce competition and crowded areas of city life than the tall blonde peoples, who, on the other hand, prove the apter pioneers in the open country, and can better face the rigours of northern climates and exposure to northern weather. All the populations of the large cities of Europe and America tend gradually to become darker and probably shorter as time goes on. It is no more necessary to attribute the decrease of stature than the increase of depth of hair and eye colouring to the pernicious effects of town life, though street surroundings, crowded houses, malnutrition, and insanitary conditions may have some effect on both or either. The phenomenon may really be due to the superior vitality and power of the smaller, darker men to resist certain city-bred diseases, and to a slightly increased mortality or to an absolute bodily removal back to country districts of the tall fair stocks. At any rate, most careful and thorough investigation would be required before it would be safe to give an opinion on the point. It is possible that much disappointment and social unrest would be saved, if it became the habit of emigration officers, or even of town-planning authorities, to make a careful study of the qualities and antecedents of the people admitted,

before they were allowed to settle in any particular district.

2. Effects of Environment.

The whole problem of environment is one of extreme difficulty and intricacy. It seems to be assumed generally that to improve surroundings must necessarily raise the quality of the inhabitants of a country. But we must distinguish between the certain good to the existing inhabitants and the indirect effects on the hereditary qualities of the future populations. The latter are often doubtful. To take an instance: Let us suppose a city authority has a slum area of the worst description, inhabited by a poor type of humanity. This area is cleared, rebuilt, and made more sanitary. Three movements of population may apparently occur. The original inhabitants may return, and, with the better circumstances, become slightly more numerous and more profitable citizens. A better class may move into the new houses, increase in number, and take possession of another neighbourhood, driving the worst of the original inhabitants out to create fresh slums elsewhere, and possibly to diminish somewhat in their rate of reproduction. In both these cases there is probably a balance of racial gain; though the second case appears to give the better result of the two. A third alternative is that persons of the original type may return in increased numbers, recreate the slum, draw in recruits from yet lower strata of the population, and make room for an accession of population of a yet lower standard in some other region. Such a result would certainly bring about a distinct falling off in the average qualities of the future inhabitants.

It is not safe to generalise on a subject where so few facts are actually known, and in which so much sentiment is lavishly invested. There is one advantage in such improvements in the conditions of life, which cannot be gainsaid. It enables sound families, who had fallen into the bad environment by accident or misfortune, to raise themselves therefrom. It acts as a segregating agent,

allowing the better strains to separate themselves from the worse, and leaving the latter as a clear-cut definite problem. But the wider question is not so clear. Judging from the conditions of social and racial advancement in a more primitive and natural state, any improvement in surroundings which is desired, planned, carried out, and taken advantage of by one and the same set of people probably results in a distinct rise in the quality and quantity of whatever section of the community is responsible for taking action. But when the persons who are to receive the benefit remain what one may call actively passive, neither desire nor understand the object of the alteration, and expend neither thought, labour, nor money to bring it about, there is a strong probability that much of the work expended will merely serve to increase the number of persons, contributing less than they consume to the common store. This type ought to be numbered among the stocks, who, in a healthy, progressive nation are on their way to achieve gradual disappearance. Now that natural selection in mankind is reduced to a minimum, it must be one of the functions of civilised society consciously to select and reject among its constituent members.

3. Rise and Fall of Nations.

In considering the causes which have led to the decline and fall of nations, it was suggested elsewhere¹ that the decline in the birth-rate of each of the abler and more valuable sections of the community, and the increase in numbers and better chances of life of the actually feeble-minded and less effective and profitable citizens, owing to improved surroundings—such as is now taking place in Western Europe, and probably occurred in Rome and Greece a couple of thousand years ago—may be the actual cause of the downfall of any civilisation where these phenomena are observed. It is very difficult to make people realise that great alterations in the racial

¹“Decadence and Civilisation,” by W. C. D. and C. D. Whetham : *Hibbert Journal*, Oct. 1911.

value of a nation may rapidly occur—not through the direct action of external causes, but through some widespread tendency of selective breeding—and that not only its own intrinsic merit, but its position in the scale of values, relatively to other races, is constantly altering with the perpetual variation in the number and quality of the people who go to compose its total vital resources.

It is not possible in this place to pass in review the various historic episodes which might be solved by a consideration of the biological factor. Historians and economists invariably assume the immutability of the human species, when they endeavour to assign causes to the phenomena of national progress or decay, whereas a constant variation of quality and quantity is the one certain factor with which they have to deal.

Now there are three great periods of economic and intellectual activity in Europe, which are represented in England by the revival of arts and learning in the thirteenth century, and with the achievements associated with the reigns of Elizabeth and Victoria. The first period is connected with the re-discovery of the literatures of Greece and Rome and with the gradual settlement of Europe after the destruction of the Roman Empire and the ravages of the barbaric invaders. The reign of Elizabeth is marked by the renaissance of the arts, by the discovery of America, and the great stimulus the new world gave to commerce, enterprise, and imagination. The causes which contributed to the success of the Victorian era are still within recent knowledge, and are differently assessed by various observers.

There are some figures given in the summary of the *Dictionary of National Biography*, which illustrate the fluctuations of ability at different periods of English history. The standard of distinction required for admission is believed to remain fairly constant, except perhaps for a slight lowering towards the end of the eighteenth and throughout the nineteenth centuries. The editor notes that there are 186 entries for the eleventh century, 377 for the twelfth 515 for the thirteenth, 678 for the

fourteenth, and then a drop to 659 for the fifteenth, in spite of the fact that the population probably remained fairly constant in average number until the age of Elizabeth. It seems possible that this arrest of ability may be due to the arrival of the friars early in the thirteenth century. They represent the great humanising movement of the period, and spent their lives endeavouring to mitigate suffering and equalise social advantage. Many of the best individuals of the nations hastened to enrol themselves in their celibate ranks, and may thus have afforded a statistical object-lesson in the value of selective breeding. The fifteenth century, in England, the epoch of the Wars of the Roses, in which the arrest of ability is most marked, proved to be one of disorganisation and internecine conflicts, and the absence of any really great leaders of thought and action is very clear. With the destruction of the monastic orders, the number of able men leaps to 2138 in the sixteenth century, 5674 in the seventeenth, while the eighteenth, with but 5788, shows another check, possibly due to the destruction of able and wise men during the Civil Wars, the emigration to America, and the disorganised condition of family life during that unhappy time. Here, then, there is direct evidence of a selective reproduction, to which any one may assign appropriate causes and effects.

4. Growth of Population.

The growth of population is a most interesting subject, which, with the modern system of keeping and publishing careful official records, can now be followed with considerable accuracy. It is difficult to say what conditions of population are really the most favourable to a prosperous national existence. Certainly throughout the periods of expansion, England throve remarkably well with a birth-rate of about forty per thousand, a city death-rate of nearly eighty per thousand, and a country death-rate which was considerably lower, though well in excess of the present mortality, figures which would horrify any existing medical officer of health and probably result

in the appointment of at least one Royal Commission of Inquiry. But the town population was then very small, and the process of creating a type able to resist the insanitary conditions of city life was necessarily severe in its methods of rejection and elimination. A low birth-rate and high death-rate indicate that a community is well on the way to extinction, and need not be taken into much account. Of the remaining two combinations—a low birth-rate and a low death-rate or a high birth-rate and low death-rate—the second certainly gives the combination which is preferable, providing always that the greatest number of births is not taking place in the least valuable sections of the population.

It is impossible to lay down a general rule that will fit all societies at every stage of their development, but in existing conditions in Western Europe, it is necessary, in order that a nation should maintain its quality and its numbers unaltered, that an average of about four children should be born to each marriage which produces children at all. There will always be a certain number of naturally infertile marriages, a certain number of persons who will not, and some who ought not, to marry, and an unavoidable proportion of deaths before maturity is reached. Allowing, then, for these accidents of life and circumstances, a nation, or a section of a nation, which normally produces less than four children to a fertile marriage may take its place among the failing forces of humanity, and its characteristic qualities, whether good or bad, will eventually disappear with those of the bison and the dodo.

With a view of estimating the class of alteration now proceeding in the British Isles, it is worth while—bearing in mind the results given in the preceding paragraph—to turn to the figures for the birth-rate in different sections of the community, which have already been set out on pages 33 and 34.

This is not the place to inquire into the causes which have led to the remarkable decline of the birth-rate noted above. Where so many different nations and classes

are affected, and so many persons of varying aims, ideals, and circumstances are involved, there must be many contributory reasons at work to produce as widespread a result. It seems perfectly clear that there is no appreciable diminution of the natural fertility of the nations, since the families of the Protestant clergy, the devout Roman Catholics and Jews of all nations, certain industrial classes, such as miners and casual labourers, and the feeble-minded are unaffected, or affected to but a slight extent, by the decline in the size of the family prevalent among the majority of the well-to-do laity and the thrifty skilled artisans.

This phenomenon of the restricted birth-rate has modified profoundly almost all the problems of biological sociology. It has rendered the inborn qualities of the future population indefinitely more sensitive to present social and economic influences. It is, indeed, this factor which gives to Eugenics its supreme importance.

5. Religion and Race.

It is difficult to close even a brief introduction to the study of Eugenics without some allusion to the moral and religious aspects of the subject. Yet morals and religion form the most debateable ground discovered by the human intelligence, and, this being the case, there is grave objection to introducing them into an elementary treatment of Eugenics.

But without religion and without morals, there is apparently no possibility of existence for the human race. Long before the heathen in his blindness—or more correctly, in his gropings after the light—bowed down to wood and stone, a sense of right and wrong and a recognition of some outside influence moulding human nature had become part of the unconscious heritage of mankind. In every race which has survived to present times, or has left any trace of its existence, religion has existed in some form or other; and it has always been most highly developed amid the peoples who have taken a prominent position on the face of the earth.

Thus it becomes certain, not only that religion is a definite biological factor in the social economy, but that its value is probably supreme, and that some form of religious development is an absolute necessity for the successful evolution of human society.

The clue to the "survival value" of religion is to be found in the fact that the interests of the individual are not always identical with those of the race; that, indeed, in many cases, they are sharply opposed. For the race it is necessary that selection shall be rigorous and effective. Many must be called into life that few may be chosen as the parents of the next generation. It is only when men come to have a closer knowledge of the workings of Nature, that they realise the possibility of the infinity of variations and combinations dwelling in her secret recesses. Hence it is necessary to create with a lavish hand in order that the few that are best worth preserving should have a chance of coming into existence; and hence also arises the need of a world which is often ruthless to the individual in this life in order that the race to which he belongs may improve or even survive.

From this point of view, the essence of religion, the character common to all religions, is the supernatural sanction afforded for unselfish conduct of no immediate advantage to the individual; a sanction based on an insight into the relative values of the earthly life of the individual and the dimly conceived totality of the spiritual contents of the universe. No merely rational system of morals has yet been found sufficient to induce the individual to acquiesce in rules of conduct and in conditions of life, which, although advantageous to the race, are obviously opposed to his immediate comfort and convenience. Nothing but the forces of religion can keep the scales even between fleeting temporal advantage and eternal spiritual gain.

The creative impulse is at work on all sides. Plants and animals reproduce themselves up to the limit of their means of subsistence; external circumstances alone appear to set the bounds to the multitude of their varieties

and manifestations. It is as though some principle of life were everywhere concealed and were struggling to find expression in every direction, transforming inanimate nature into a means of reaching some form of consciousness. Man is the highest and most favourable example of the incarnation of the breath of life in that he alone appears to be aware of the drama in which he is called upon to play a part, to take an intelligent share therein, and to have the power of acting, not as an unwitting agent, but as a shareholder, a trustee, and a co-director—during the short years of his human existence—in the eternal purpose which is moulding the spiritual destinies of the Universe.

APPENDIX AND BIBLIOGRAPHY

FOR further information on the subjects dealt with in the first chapter, there are many books which may be consulted. Sir Francis Galton published *Memoirs of my Life* in 1908 (Methuen), which gives an account of his gradually developing interest in all matters affecting human inheritance. The volume contains an appendix, with a chronological list of Galton's publications, whether privately printed, published in magazines and scientific periodicals, or issued as complete volumes. The most important ones for the student of Eugenics are *Hereditary Genius*, 1869 and 1892 (Macmillan), *Human Faculty*, 1883 (Macmillan), *Record of Family Faculties*, 1884 (Macmillan), *Natural Inheritance*, 1889 (Macmillan), and *Noteworthy Families*, with E. Schuster, 1906 (Murray). A volume of *Essays on Eugenics* has been published by the Eugenics Education Society, price 1s. 6d.

Darwin's writings are accessible in all public libraries, and many of them are now to be had in cheap reprints. The *Origin of Species* and the *Descent of Man* are probably the works which are best worth studying for the general reader. The *Life and Letters of Charles Darwin* and the *Life and Letters of T. H. Huxley*, by their respective sons, are two admirable biographies that throw great light on all the history and development of evolutionary philosophy from 1860 onwards.

There is no life of Mendel; and indeed as regards incident, except for a long and painful dispute with the Austrian Government over the taxation of the property of religious houses, there is scarcely anything to record. There is a biographical note in Prof. Wm. Bateson's *Mendel's Principles of Heredity*, accompanied by an English translation

of two of his most important papers. Prof. Bateson's volume (Cambridge University Press, 1909) is the standard work of reference for an account of discoveries in regard to Heredity made by the application of Mendel's methods of research. Prof. Punnett published a small and admirably clear little book called *Mendelism* (Bowes and Bowes, Cambridge, and Macmillan and Co., London) in 1905, which has now been enlarged and rewritten. *Heredity*, by L. Doncaster (Cambridge University Press), 1911, is also well adapted to the general reader.

Several of the writings of Cesare Lombroso have been translated into English, and have been published either in England or America. *Criminal Man* (1911) gives the results of his work, and throws light on the methods of research adopted by Lombroso.

As regards the second chapter, the subject of racial qualities, the principal discoveries and results have been published in various places. Much valuable information is to be found in magazines devoted to medicine and biology, but the most complete memoirs have been issued by the "Francis Galton Laboratory for National Eugenics," University of London, under the direction of Prof. Karl Pearson. *The Treasury of Human Inheritance* gives full plates illustrative of various abnormal conditions, with pedigrees and descriptive text, and is published as the material accumulates and as funds permit. The *Drapers' Company Research Memoirs* are also issued under the same auspices. Many papers of great interest appear in the *Eugenics Review*, price 1s., issued quarterly by the Eugenics Education Society.

A great deal of very valuable work is in progress both on the continent of Europe and in the United States of America, to which references will be found in many of the above-mentioned books and publications. But the American and continental papers are not likely to be easily available for the general reader in England, so that it is here unnecessary to give further details.

For the third chapter, all the blue books, reports of Royal Commissions, etc., issued by the Government can

be bought at cost price, through any bookseller, and most of the more important ones ought to be found on the shelves of all public and proprietary libraries. An abstract of the Report of the Royal Commission on the Care and Control of the Feeble-Minded, with an introduction by Sir Edward Fry, G.C.B., and other contributions was published in 1909, price 1s. (P. S. King and Son, London). Many "Annual Reports" of great interest make their appearance at various seasons of the year, and are generally commented on, or the results given in abstract by the principal London and provincial newspapers.

For the general aspects of the subject, treated partly from the historical and partly from the scientific point of view, reference may be made to a work published by the present writers entitled *The Family and the Nation* (Longmans), 1909, and also to their book *Heredity and Society* (Longmans), 1912.

Social Evolution, by Benjamin Kidd, gives an interesting view of the influences, other than biological, under which society has gradually developed. Prof. Bergson's *Creative Evolution* (Macmillan and Co.), 1911, as translated by Dr. Arthur Mitchell, deals with an aspect of the problem of creation that is attracting great attention from students of modern philosophy. His "Huxley" lecture, printed in the *Hibbert Journal* of October, 1911, gives the substance of the larger work in a form which should prove of real value to the reader who is unversed in philosophic literature.

H. S. Chamberlain's *Foundations of the Nineteenth Century*, written and published in Germany, has gone through eight German editions since 1899, with a total sale of sixty thousand copies; it has lately been translated into English (Lane, 1910). It contains a most arresting and suggestive account of the intellectual and social development of mankind, and, for the first time, assigns to racial factors their true importance in the history of nations, of thought, and of religion.

The Eugenics Education Society has its offices at

6 York Buildings, Adelphi, Strand, London, and arranges for lectures, discussions, and general meetings. Membership involves an annual subscription of one guinea, associate membership of five shillings. Members only receive the *Eugenics Review* free of charge. Branches of the Eugenics Society have now been formed at Liverpool, Manchester, Dublin, Glasgow, Birmingham, Cambridge, Sheffield, Haslemere, and in New Zealand. Others are in course of formation.

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