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A QUESTION OF RACE

IN the "Lancet" of 17th October, 1942, it was shown by Ridehalgh that Irish nurses seemed to be more susceptible to tuberculosis than those of Great Britain; this was followed by a leading article on 31st October, 1942, on Tuberculosis in Eire. Again attention was called to the apparent susceptibility of the inhabitants of Ireland to tuberculosis. This is a subject which has interested me since first I read in Osler that the Irish in America have a very high death-rate from tuberculosis, almost double that of the next people on the list. In 1907 I heard, in the Ulster Hall, one of my teachers declare roundly that the Irish race are especially susceptible to tuberculosis. Unfortunately, the facts on which these statements are founded still remain facts. The incidence of tuberculosis in Ireland and the death-rate from it remain distressingly high when compared with other countries. In 1927, when England and Wales had a death-rate of 97 per 100,000, the Irish Free State had one of 145, and Northern Ireland 141. In 1937 the rate had dropped in England and Wales to 69.5, but in the Irish Free State it was 123.4. In Northern Ireland, however, it had fallen to 97.7, which was still far too high, so that notwithstanding every advance in the welfare of the people, made good up to date, the rate remains excessively high relatively to Great Britain.

Now, this may be due to several factors. That one which the learned professor had the toughness to formulate, namely, that there is a racial weakness, has never been disproved. Usually it is placed mysteriously in the background, denounced half-heartedly, it is true, but one is generally left with the impression that there may be something in it. Nor is this to be wondered at, for the subject is a very difficult and complex one in itself, and it borders on such regions of prejudice and emotion that to attack it is a task which cannot be undertaken without some hesitation. However, in such a case the lightly equipped general practitioner may rush in where experts fear to tread, and perhaps may hope to



escape from this thorny problem with fewer scratches. In any case it may provide enough to interest you for a while, and perhaps we may even get a little profit from it.

Popularly, race is accepted as a self-evident fact; to deny its existence seems opposed to common sense. If we think not only of the differences that seem so obvious between European peoples, but of those, throughout the world, between Europeans, Negroes, Chinese, and Australian aborigines, we see variations so great that there has been serious discussion as to whether mankind can be included in a single species or must be divided into several. Yet, notwithstanding all this, we have Professor Dahlberg writing: "The assumption that pure races exist or have ever existed is purely a hypothesis which has very little scientific basis," and Huxley, Haddon, and Carr Saunders also state: "Race turns out to be a pseudoscientific rather than a scientific term." On the

William Dickey

other hand, the subject of race is still an active scientific study. In the current numbers of the "Ulster Journal of Archaeology," for example, you may read extremely interesting and learned articles by Professor Walmsley, with Mogeey and Gamble, on the "Peoples of Northern Ireland," and if we consider that this science deals from the physical side with the nature, origin, history, and destiny of man, we will find it impossible to exaggerate its importance, and especially now, when false conceptions of race have caused such horrible disasters in the world, and also when, as some believe, the world has become a single unit in which there will be free miscegenation of all varieties of mankind, with what consequences science as yet can tell us little. It is scarcely possible, also, to take up a medical book or a medical journal without finding some reference, somewhere, to race. It is evident, therefore, that there is justification for an attempt to discover how all this bears on medicine.

Our objective, then, is strictly limited. We do not and cannot go into the question of race in general, except in so far as it bears on our subject, namely, "Is race a factor in the causation of disease?"

In considering race, disputes often arise from failure to define properly the terms used. First then, let us begin by saying that a population, all varieties of which can, and do interbreed freely, is a single species. Still more necessary is it to define the meaning of the word "race." The very word is of indefinite meaning. It may be used for any class of living things, for example, the race of poets, the Aryan race, the race of birds, the human race, and so on, but the sense which concerns us is that a race is a human population with common hereditary physical characteristics derived from common descent, and we have especially to beware of two meanings which are likely to confuse the issue of our enquiry; that is, the use of the term to designate populations of similar culture and traditions, and also populations which speak the same or similar languages. We have plenty of evidence in Europe to-day of the dire consequences which may ensue from confusion of these senses of the term. Nor is it only in Germany that a demagogue may use the word in such a way that in one speech it may mean any or all of these things, so that from premises not easy to refute because of their vagueness and plausibility he can persuade the populace to his disastrous conclusions. As nations were supposed to be of common descent, when nationalism arose in Europe it was easy to use the term 'race' as synonymous for nationality, especially for the nationalities which were struggling for freedom, and as language was usually the badge of these

nationalities, it was natural that language should be accepted as the mark of race.

The work of philologists and often of historians lent scientific plausibility to this view of the matter, so that a linguistic definition of race was a common one in the nineteenth century. The inhabitants of Europe came to be classified as belonging to the Teutonic race, the Celtic race, the Slavonic race, and so on, and finally the philologists discovered the connection between the Aryan languages, and the Aryan race was born. These conceptions were adopted into the popular consciousness with political results which were sometimes unfortunate. They still survive in popular mythology.

The word race however still had the connotation of common descent, and this began to be investigated by the physical anthropologists, Topinard, Deniker, and others, and especially for the English-speaking world, Ripley, in his famous book, "The Races of Europe." They showed that physical types are distributed independently of language and nation. They found a mixture everywhere, though, of course, types were not distributed uniformly. In Northern Europe it was found that a large proportion of people had fair hair, blue eyes, tall stature, and long heads, though these characters did not occur together always, nor even often, but they assumed that a tall, fair-haired, blue-eyed, and long-headed people had at one time existed, and had formed an important part of the ancestry of these peoples. This people became known as the Nordic race.

Similarly, a smaller, swarthy, dark-eyed, dark-haired, long-headed race was distinguished in Southern Europe. This was called the Mediterranean race.

And in Central Europe a race just as well marked in physical characters, but broad-headed, was found to make up a large proportion of the population; this was called the Alpine race. Other races of less importance were also distinguished.

It thus seemed that, on indisputable evidence, the Celts, Teutons, and Slavs of the nineteenth century were to be displaced for ever by Nordic, Alpine, and Mediterranean man. The linguistic ethnology which had convulsed Europe had gone down before the callipers and the colour-charts of the physical anthropologist, and what seemed to be a happier era had dawned. But the ultra-nationalist is incorrigible; he used the new knowledge for his own base purposes as easily as he had the old. The world found itself not one whit the better for the displacement of the Teutonic by the Nordic race. But there were facts that did not fit in, and these presently led to an

William Dickey

elaboration of Dinaric, Finno-Baltic, Atlanto-Mediterranean, and many other races that might have seemed to present a disconcerting analogy to the cycles and epicycles of pre-Copernican astronomy. Characters seemed to spread outside the domain of the race to which they had been assigned. Fair hair and blue eyes were found not only in long-headed populations, but also associated with broad heads, and even with distinct Mongolian physiognomy. Broad-headedness, itself, seemed to be associated with most varied physical characteristics, and so on. Now another factor arrived on the scene. Mendel had made his famous discoveries in the sixties of last century, but they had lain hidden until revealed in 1900 by De Vries and others.

Fortunately, I can assume in this audience some knowledge of the Mendelian and other modern theories now universally accepted in the science of genetics, but I have to refer to some points necessary for the purpose of this paper.

The units in the conveyance of hereditary characters are the genes; what they consist of we do not know, but each gene has a definite fixed place on a definite chromosome. When a cell divides, the chromosome divides, and the gene also divides, giving rise to an identical daughter gene at the same position on the analogous chromosome of each daughter cell. The cell-chromosomes are in pairs; each pair consists of a chromosome derived from the germ-cells of each of the two parents, and each pair of chromosomes has analogous genes situated at similar positions on it. That is to say, each bodily character is governed not by one but by two genes, derived from the parental and maternal germ-cells respectively. But many physical characters are affected by several pairs of genes, and many genes affect more than one physical character. In each pair of genes one may prevail over the other and act as if it were absent. The prevailing gene is then said to be dominant, and the other recessive. The recessive gene can only show its effects when associated with a recessive partner in the pair. Sometimes, however, the prevalence is not absolute, and the genes both have an effect, which may be intermediate or even different from what they could effect separately; this is the condition of incomplete dominance. The genes may be considered as relatively stable. They do change, over long periods. Mutations occur, but they are the exception, and very often they are detrimental, so that their numbers in the population are kept low. But in the long period in which man has existed, there has been a certain amount of change, so that many genes now exist in two or more forms.

These differing forms are called allelomorphs. But in considering present-day populations, the rate of effective change is so low that we can without too much error accept these allelomorphic genes as unchanging for very long periods, each gene passing from germ-cell to germ-cell for many generations without much alteration. In this we have the support of archaeology, which has shown that in many countries, Egypt for instance, many physical types several thousand years ago were much the same as to-day. Man has forty-eight chromosomes in his body-cells, that is, twenty-four derived from each parent, or twenty-four pairs. These chromosomes must carry very many genes, probably many thousands. The basis on which the concept of race rests must lie in the modification the various genes have undergone in the distant past. It is the effect of the differentiated allelomorphs which cause the differences in human populations. It would seem to be a hopeless task to try to get any complete view of the genetic constitution of any individual, to say nothing of any population. The theory of race presupposes, however, that the presence of a limited number of visible characters indicates a particular genetic constitution. If we examine the question, then, from the point of view of the visible characters, the matter is complicated, but we can find a number of them whose inheritance seems to be relatively simple, and it is to these that we may go with some hope of light on our problem. For if populations with certain racial characteristics are prone to certain diseases, what concerns us is not the totality of the characters which give them the rank of race, but the single character of susceptibility to disease. And, if we can examine the behaviour of any genes, or rather of their associated characters, we can assume that what is true for these characters is likely to be true for the disease-bearing characters of which the existence is in question.

We have seen that the linguists and historians, although their conclusions were mistaken, believed that man should be studied as man; whereas the anthropologists and geneticists tend to regard him as an animal, using methods of study and reasoning which had been successful in biological matters. If man is an animal, he is very different from any other. Animal life is much more under the control of instinct and environment than human life. The swallow swings to and fro to its nest under the eaves, across half the world; the salmon returns to the river of its birth; the caribou wanders from winter to summer feeding-grounds unguided by reason or tradition. But for man the chains of instinct have been loosed. His guides are

William Dickey

reason, emotion, imagination, tradition, and cupidity. For him Tir-na-nogue, the promised land, or eldorado, always lie just beyond the horizon; for him there are always gods or spirits to direct, the example of ancient heroes to follow, wealth to be gathered, adventure to be experienced, and curiosity to be satisfied, so that his path is incalculable. Neither sea nor mountain, nor heat nor cold, can bar his way. He can by the use of his reason and of his tools adapt himself to life anywhere, to all environments where existence is possible. The result has, been that even within historic times every people of which we know anything has been through a complicated maze of wandering, conquest, emigration, immigration, and slavery. And if this is so during the comparatively short period of historic time, what must have been the total sum of nomadism throughout the immense period during which modern man has existed. The shadow of the Mosaic chronology still lies over us to-day. We are very apt to imagine that what has happened during the last three thousand years overshadows completely what happened in the illimitable past before.

It is a remarkable fact that there is only one single species of man in the world to-day, a species which is world-wide in its distribution and has no near relatives living. It is unique, and its uniqueness must be a consequence of some quality of its humanity. Few, if any, human groups could have existed in isolation sufficiently long to form distinct species. If any did, it would seem probable that the consequent loss of contact with *homo sapiens* and inability to profit from the new ideas brought by contact with other peoples, would in the end mean certain extinction, at the hands of its human enemies, long before it could attain a secure footing in the world.

If then, species formation was denied to man, how did he effect the physical adaptations necessary to different environments? In a species so continually hybridizing, the action of natural selection would be to preserve the genes governing the characters fittest for the particular environment, so that in time these genes would exist in a genetic assembly very different from that in which they first appeared. For example, the black-skinned peoples of to-day may inherit their black skin from ancestors who were very different from them and from us. Natural selection of hybrids replaced the natural selection of species, so that the appearance of a striking and ancient character in a special environment by no means gives any clue to the genetic composition of its bearer.

Nor, in the case of man, is natural selection the only manufacturer of apparent races. Man can and

does by the use of his peculiar mental qualities produce what are called artificial races. If gentlemen really preferred blondes, then generation after generation the race of gentlemen would become and remain more blonde. This is a short-term effect of which there are many examples. The most famous one is that of the Jews. The only physical thing that all Jews have in common is their Jewish appearance. Jews may be tall or short, fair or dark, long-headed or broad-headed. In short, they tend to approximate in physical characters to the people amongst whom they live. It seems, therefore, that in the past Jews preferred often to marry people who looked like Jews, and the Jewish appearance was the result. Another well-known example is that of the Basques. Those who live in Spain tend in hereditary characters to resemble the Spaniards, while those who live on the French side of the Pyrenees resemble in the same way the very different population of that part of Southern France, yet many of both sections possess the remarkable Basque head, wide at the temples, with long narrow face. This form of selection only affects visible characters, and has no relation to the hereditary constitution of the people concerned.

Now, let us consider the case from the point of view of the hereditary characters. First, we will take certain characters that are not visible, nor, so far as we know, linked with any physical characteristic. Characters which are certainly not concerned in artificial selection, and which probably are not much affected by natural selection, that is the blood-groups A, B, and O. These are inherited in a relatively simple manner, though, as you know, their inheritance is quite enough complicated. Their distribution is remarkable. Group A occurs in especially high frequency in western Europe; group B is high in southern and eastern Asia; and group O very high in the aborigines of America. This distribution could be and has been considered as indicating racial differences. But the matter is not so simple. Group B is by no means confined to Asia, nor is group A to Europe. Group O is also common everywhere. Not only so, but there is no correlation with any racial mark. The most Nordic of Norwegians may be group B, and the most Chinese of Chinamen group A. Neither skin-colour, hair-colour, stature, nor head-shape affords any certain indication of blood-group; although, however, it is probable that, before European immigration into North America, practically all the Indian inhabitants belonged to group O. The most probable conclusion is that O was the original blood-group, that A arose by mutation, possibly, in Europe, B in the same way in Asia, and

William Dickey

that ever since they have been spreading over the earth unhampered either by natural or artificial selection. The curious fact results that African Negroes and Australian aborigines are not very different in distribution of blood-groups from white Europeans. And doubtless groups A and B are steadily invading to-day the blood-stream of the North American Indians. It is probable that hybridization has brought about the spread of these groups here and there all over the world unhampered by the forces which act on visible characters. They are a testimony to invisible miscegenation, and doubtless multitudes of other genes which have no effect on visible characters have had a similar history.

A second example is the absence of pigmentation in the skin. We have all heard of the White Race. A race which includes Englishmen and Turks, Italians and Norwegians has always been of doubtful authenticity, but it is a fact that white skin prevails in a continuous area over Europe and part of western Asia. This is unlikely to be due to chance.

Mutations causing loss of pigment in the skin are usually associated with the disadvantages caused by albinism. One that occurred without those disadvantages must be exceedingly rare, and the chance of its getting established very slight indeed. There is scarcely an authenticated case outside Europe. The best-known example is perhaps the San Bias Indians in Central America, but here, as in other cases, the condition is one of albinism with the usual visual defects and photophobia. Hence it is probable that the mutation that led to the establishment of white-skinned peoples appeared first in one place. Such a mutation was an advantageous one from the point of view of natural selection in the cloudy north, with its long dark winters and need for clothing, enabling its possessors to make the utmost use of the scanty and brief sunlight. And it is just here that we find it, especially, in association with fair hair and light eyes, which would be likely to arise at the same time from the same cause. But if it was a favourable mutation in the north it would be likely to migrate wherever its possession was advantageous. That it did so was evident, and as it left its original northern habitat, it came to be associated with the very varied physical characters favoured by nature or man in its new homes.

It is also evidence that movements of population from north to south are very ancient in Europe. Thousands of years before the fair-headed Achseans arrived in Greece, similar movements of population must have been taking place. A third example is the distribution in Europe and Asia of broad-headedness.

It extends right across the land-mass from Mongolia to France. Again we can assume that the continuous area means spread from a single focus. So that the genes involved are now common to peoples so different as the Mongols and Swiss.

We may draw some tentative conclusions. Genes and the characters governed by them migrate freely and in the long run show no linkage. The genetic linkage due to occurrence on the same chromosome seems largely to be cancelled out by the process known as crossing over. But it must be remembered that many genes affect more than one character, and that, for example, a gene that affected any of the endocrine glands would cause variation in many characters. Genes which are fitted to a certain environment by natural selection and those which are selected by man himself are no sure guide to the presence or absence of other genes. Therefore, every so-called race must comprise many genes in common with the population all around it.

Race, as it is commonly recognised, depends on an assemblage of visible characters, each of which taken by itself is likely, in nearly every case, to occur in many other populations. Nor are all or any of these characters a certain guide to the amount of genetic kinship with other peoples.

There has been intermingling of populations all over the world, throughout human history. The degree of intermixture found at any time or place would depend on how far the population was isolated by geographical or other factors. In the far distant past, when man's equipment for overcoming geographical difficulties was limited, the degree of isolation may have been sufficient to allow of the formation of actual geographical races, analogous to those existing in the animal world, and from that period may date characters which constitute some of the most striking visible differences between men to-day.

Now let us return to Ireland, where we began, and see if we can apply these principles. Ireland is an island, and an island may be supposed to be in a position of relative isolation. But an island is at the mercy of foreigners who have learnt to control the sea. Ireland in the Palaeolithic Age no doubt at times had land connection with the Continent, and so far as it was habitable, was not isolated. But it seems probable that the human population of Ireland must have arrived by sea. It is not for nothing that one of the famous ancient books of Ireland is called the "Book of Invasions." Control of the sea is very ancient in Europe. We have in the south the evidence of the seafaring civilization of Crete, which could only have

William Dickey

come into existence after a long evolution of sea-going craft. And in the north we can see sculptured on the Scandinavian rocks the great war canoes of the Bronze Age, of which the same can be said. Thus isolation in the British Isles was, probably, as precarious in the Neolithic Age, and after, as it has been since the Viking Age. Race in Ireland, as elsewhere, has been determined by various arbitrary race-marks, such as stature, cephalic-index, head-form, colour of skin, colour of eye and hair, and so on. If we take these separately, we find, to put it moderately, that there is not very much difference between Ireland and Great Britain. Tall stature is just as common in one as in the other, cephalic-index much the same, light eyes very common in both, skin colour is very light in both, even hair colour covers the same range. It is true that in Ireland hair colour is rather darker, and eye colour rather lighter, a curious fact that may point to some period of sufficient isolation to allow of the formation of an artificial race with dark hair and light eyes. If this be true, it indicates the very ancient arrival of Nordic physical characters in Ireland. Light eyes and white skin can only have come from the north. In fact, by the use of a little hydrogen peroxide, Cathleen ni Houlahan could be converted into a Nordic who would satisfy the standards of the most rabid Nazi. It is very evident then, that if we consider these characters separately, not one of them is peculiar to Ireland. Even if we take characters that occur only in a minority of the population, such as black eyes, or broad heads, these occur also in a minority of the British population. What room then is there for the hypothetical character which renders the inhabitants of Ireland susceptible to tuberculosis? It should, alone, of all these characters, exist in high frequency in Ireland, and low frequency, or not at all, in Great Britain. It should exist despite natural selection, and could not be favoured by artificial selection. It would contradict what we have seen to be true of the other characters. The hypothesis, therefore, is ridiculous. The causes of the alleged susceptibility of the Irish to tuberculosis must be looked for elsewhere. If they can be found in bad sanitation, bad social habits, malnutrition, and poor housing, then we have a responsibility which we cannot shelve on to some alleged mysterious and inevitable evil racial predestination.

Now, if these considerations are valid in Ireland, it is very likely that they are valid elsewhere. Let us take a few examples of so-called racial diseases, and see if we can find another than a racial explanation for them. We will find that apparent racial susceptibility to disease can, usually, be shown to be due to other

causes. Many diseases seem to have a racial distribution. The simplest case is that in which the disorder is consequent on some character recognised as a mark of race. It is said that in Australia, white-skinned people often exposed to fierce sunlight may occasionally develop epithelioma of the face, an obvious consequence of the frequent irritation caused by sunlight on the unpigmented skin. Similarly, Negro children in New York are especially prone to rickets, and this, although poor nutrition is also a factor, may be correlated with their inability, owing to the pigmentation of their skin, to form sufficient quantities of the necessary vitamin. Again, tuberculosis in North America is excessively common amongst Negroes. According to Kayne, comparing Whites and Negroes, "There can be little doubt that a racial difference in resistance to tuberculosis exists," and he adduces similar evidence from the gold mines in South Africa. Here also, as in Ireland, we have to consider the unfavourable environment, bad sanitary conditions, malnutrition, bad social habits, and sometimes previous inexperience of the disease, but, in this case, when these things are allowed for, the evidence of high susceptibility remains.

But there is another factor, that is, the deeply pigmented skin of the Negro. Is it any wonder that these children of the sun, shielded from his beneficent rays, not only by the dark skies and thick clothing of the North, or, in South Africa, by the gloomy twilight of the mines, but also by their darkly pigmented skins, should develop tuberculosis? When we have added to this, extremely bad sanitary conditions, it would be astounding if they did not. In these cases the susceptibility to disease depends not on the race, but on one or two characters which may accompany a very varied genetic constitution. The susceptibility of the Negro to lobar pneumonia is also well known. In this case, also, as soon as the mysterious word race is thought of, its paralysing effect is enough to stop any further inquiry. Yet, if we think of the adaptation of the negro skin to rapid cooling, the increased radiation from its black surface, and its remarkable development of sweat glands, we may think that a possible cause, which is worth investigation, lies there.

Now, let us take an example of a different kind, one of the numerous cases affecting the Jews. There is a disease called amaurotic family idiocy. This occurs almost solely in Jewish families. It comes on in infants, from about three to six months old, it may attack several members of the same family, progressive bodily and mental weakness sets in, the child becomes blind and paralysed, and finally dies. The

William Dickey

parents are usually quite normal.

The Jews are often isolated from their neighbours by their religion. That isolation, as we have seen, is by no means perfect, but in small communities it is, unfortunately, often perfect enough to produce genetic disaster. A small community is likely to show an undue amount of interbreeding. If a detrimental recessive gene occurs in it, it is very much more likely to be matched with its like on fertilization, than it would in the great world outside. The case is simply one of two recessive genes, carrying defective characters, coming together. Outside the community, the small number of recessives have a very small chance of meeting their like, and remain hidden under the control of their dominant and healthy partners. Inside the community their chances of meeting are much increased, and the apparent racial difference results. Such occurrences are by no means limited to the Jews. The village idiot is no accident. He was an indication of the isolation of some villages in the past, and is becoming less common with the intermixture of blood following on modern conditions.

Then there are such cases as that of sickle-cell anaemia. This disease is rare, it occurs in Negroes and Mulattoes. The red blood-cells are sickle-shaped, and the signs and symptoms are those of anaemia of various degrees of severity. It is related to a defective dominant gene. In this case we have, probably, an example of a disease that has arisen by mutation amongst Negroes, as many diseases have arisen amongst Whites. The only difference is that it occurs where Whites and Negroes are in contact, and has not yet passed over the colour line. The partial isolation of the Negro and the rarity of the condition are quite sufficient explanation, and doubtless, in time, it will attain the dubious distinction of being associated with a white skin.

Now, let us consider the numerous cases where disease seems to take on an exceptional virulence in certain peoples who have not had previous experience of it. We will take the striking and tragic case of Polynesia. After the first contact with Europeans, many Polynesian islands were devastated with epidemics of European diseases. Measles, whooping-cough, dysentery, tuberculosis, and syphilis, slew the natives in tens of thousands, whole communities were exterminated, the population steadily dropped. It seemed evident to all, even to the Polynesians themselves, that they were a dying race, and that the Pacific was fated to be repopulated by Asiatics. This splendid people, living in what the old voyagers thought to be an earthly paradise, had

dropped in numbers from, probably, well over a million, to a mere 180,000 in 1910, and seemed well on the way to extinction. But the unexpected happened, the decline stopped, and rapid increase of population began. The Maori have more than doubled their numbers, the Samoans have increased by sixty per cent., the Tongans by thirty-seven per cent., and so throughout the Pacific, even amongst the communities with little European blood. What was the cause of the catastrophic decline and of the astonishing recovery? It has been said that the remedies for a dying race are proper feeding, proper housing, and effective sanitation. There is no doubt that this is true. The numbers of our own ancestors were held in check for centuries by disease, otherwise there would not have been standing-room on the earth, and the increase in Polynesia, as in Europe, is no doubt due to better hygienic conditions. But is it the whole truth? Some of these populations lived under what Europeans regarded as ideal conditions, and were healthy, well-fed, and happy, before the European serpent had penetrated into their Eden. Their social habits were sometimes, no doubt, dangerous under the conditions of European civilization, but that will not explain the whole matter. These dreadful epidemics were deadly because the infections were new to the islands. They were inexperienced in resisting European diseases. Their sanitary conditions are now improved, but they have also acquired at a terrible cost the necessary resistance, and rapid increase of population is the result. Then there is this question of acquired resistance by a people. Thousands of little Polynesians arrive annually in Polynesia without any experience of these diseases. Why do they not die as their predecessors did? Natural selection is the usual answer. But natural selection, acting under Mendelian conditions, is unlikely to have had such a dramatic effect in the space of two or three generations, even in the drastic form in which it was applied in Polynesia. The same would be true of Lamarckianism, if such a thing exists: there is not sufficient time for such a change. These children differ from the children of Polynesia of a hundred years ago in but one thing: their parents have had experience of these diseases. Some have thought that infants in the uterus may acquire from the mother protection from the diseases against which she is protected, and if that were so, it would go far to explain the facts, and also certain facts much nearer home. I am assured, however, on very good authority, that the weight of opinion is that such an effect does not occur. If this is true, a curious discrepancy results. The deadly

William Dickey

anti-rhesus antibodies can pass through the placenta, whilst the beneficent antibodies to disease cannot, which seems not altogether probable. No doubt, the baby of Mrs. Jones, who had recovered from measles before her confinement, and that of Mrs. Smith, who perhaps has not had measles at all, are both equally susceptible to infection, but neither of them is so likely to take measles and die, as the Polynesian infant of one hundred years ago. In other words, they certainly have got something which renders them less susceptible to infection, and where did they get it? I do not think the question can be said to be closed. We have found, now, in each case we have examined, an alternative explanation of the excessive incidence of disease to that of race. And, doubtless, many other cases are capable of similar explanation. We conclude, therefore, that a racial explanation of susceptibility to disease must be suspect, and that on examination, a better reason for the facts will always be found. Our inquiry is now over. We have seen man with all his varied characters, mingling over the face of the earth for untold ages. Sometimes pouring like a flood in innumerable currents, at others, resting in quiet pools and reaches, as the dam of isolation is broken down or holds. Thus his characters are concentrated here and there in different degrees and in different combinations, as isolation increases or decreases, but ever escaping into new associations as civilization and the capacity for movement develops. These combinations of characters are what are called races, and it is in that sense that the study of race is so urgently necessary, and remains of the utmost importance. But these ever-changing entities form a very unstable foundation for any conception of susceptibility to disease. Everywhere miscegenation is going on, and has been going on for as far back as we have evidence. Genes cannot be isolated for long in any permanent association with more than perhaps a few other genes, so that no defective gene can remain for long linked to any of the characters which are used to mark out races. Therefore, whatever the truth about race in general, in medicine we must agree with Huxley: "Race is a pseudo-scientific term," which should have no place in the study of disease. Its use obscures the truth, prevents the recognition of the real causes of disease, and the application of the correct remedies, and, in especial, there is no evidence of any racial susceptibility to disease in Ireland. If there seems to be such a susceptibility, it is due, not to race, but to causes which are preventable, and it is our responsibility to do what we can to prevent them.