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Acclimatization of Europeans in Tropical Lands: Discussion

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To act efficiently in the prevention of diseases, we must have a thorough knowledge of the parasites which induce them; we must know their areas of distribution, their extra-corporeal habitat, the conditions favourable to their development, the means by which they are conveyed to man. A great deal has already been achieved in tropical pathology by a host of noble workers, such as Pasteur, Koch, Laveran, Hansen, Manson, Kitasato, Bruce, Sanarelli, but a great deal more remains to be accomplished. There are numberless diseases in the tropics of which we know nothing, except that they kill. The young practitioner generally goes out to the colonies with only a limited knowledge of the diseases most common in Europe, unprovided with means of scientific research or totally unfit to pursue it. Whatever he sees there he groups round the few familiar types. What matters if there are striking differences? he will easily explain them by the special climatic influences of the locality. A favourite expression of Indian medical reports is that "malaria dominates the pathology of the region." In such reports, relapsing fever is malaria, blackwater fever is malaria, typhoid fever is malaria, and so are other diseases.

If attempts at colonization in the past have often been unsuccessful, if they have always cost immense sacrifices in lives and money, it is because they were made in complete ignorance of the conditions essential to success. I hope that this afternoon's discussion may finally extricate the question of tropical colonization from the old exploded theories, and place it on the sound basis of modern scientific knowledge. It would be ridiculous to continue further to dispute the possibility of tropical colonization, now that over ten million white men and their descendants are already settled within the tropics, laying the foundations of new and perhaps greater civilizations.

Before the reading of the paper, the Chairman, Sir JOHN KIRK, said: The President regrets very much being unable to attend, being still indisposed; he has asked me, therefore, if I will take his place on this occasion. The subject announced for discussion will be introduced to you by Dr. Sambon, who has had great opportunities of studying the question of acclimatization of white men in tropical Africa. I will ask him now to give us an account of his views on the subject.

After the reading of the paper, the following discussion took place:—

Dr. PATRICK MANSON said: I have prepared a few remarks on the subject of this discussion, but before reading them, I express my astonishment at the wonderful similarity between the observations I make here and those that Dr. Sambon has already given expression to—a fact, it seems to me, which goes a long way to prove the truth of his statements and deductions.

In former years, under the influence of early teaching, I shared in the pessimistic opinions then current about tropical colonization by the white races. In recent years, however, my views on this subject have undergone a complete revolution. This revolution began with the establishment of the germ theory of disease; it gathered force as, one after another, the great disease scourges of mankind, of beasts, and of plants were proved to be caused by living organisms; and it was complete when I had personally convinced myself that Laveran's immortal discovery of the protozoal germ of malaria was indeed a fact. I now firmly believe in the possibility of tropical colonization by the white races. Its practicability has already been proved for many countries. I believe the time will come when it will be proved for all countries; theoretically it is already proved, but how long we shall have to wait for the practical proof, I cannot pretend to say. Its postponement is entirely a matter depending, in the first place, on the growth of knowledge,

and in the second, on the general assimilation and common-sense application of this knowledge. Knowledge in this department of science is advancing very rapidly, so rapidly that I think we cannot have many more years to wait.

To state fully the grounds of my beliefs in this matter would only be to recapitulate the facts and arguments Dr. Sambon has so ably advanced. The gist of the situation is simply this. Heat and moisture are not in themselves the direct cause of any important tropical disease. The direct causes of ninety-nine per cent. of these diseases are germs; that is to say, plants and animals—plants and animals with tropical requirements. So long as it was believed that the peculiar meteorological conditions were the direct cause of the unhealthiness of the tropics, so long did it seem impossible to secure health there, for we cannot materially influence the weather. But now that we know that the unhealthiness of the tropics depends on the plants and animals of the tropics—the pathological fauna and flora, the position becomes much more hopeful. For what known plant or animal is there that man, in virtue of his intellect, cannot slay or protect himself against, provided he knows what it is and where it is. To contend with them successfully, we must know these plants and animals, and we must understand their habits and their vulnerable points. To know our enemy is the first step to conquest. We do begin to know something about our tropical pathological enemies. When we know them and their habits fully, then victory is within our grasp; we need only to apply the knowledge to secure it.

Most diseases are caused by parasites. Unfortunately, most parasites, when they have got below the surface of the body, whether it be the epidermis covering the body or the epithelium lining the mucous tracts, are safe. We may, to some extent, by drugs and other means, hamper them a little when thus fairly lodged; in no instances, however, can we under such circumstances be sure of killing them outright. But these same parasites, from their very nature and in order that their respective species may keep in existence by spreading from one host to another, must at some time or another leave the human body. Thus it comes about that they have perforce to live for a longer or shorter space in outer nature. During this necessary extra-corporeal state they are exceedingly helpless and eminently vulnerable. Herein lies our opportunity. To kill them then is simply a matter of knowledge and the application of this knowledge—sanitary science and sanitation, in fact.

Perhaps this fundamental principle of sanitation is best brought home by an illustration. Let me make use of an illustration drawn from tropical pathology. You will pardon me if I select one with which opportunity and study have made me specially familiar.

In nearly all tropical countries, a large proportion of the inhabitants—in some places ten per cent., in other places up to seventy-five per cent.—harbour one or other of the four or five species of blood-worms now known to occur in man. Some of these blood-worms give rise to grave disease—that hideous disease, very appropriately named elephantiasis, for example. Now, in order to prevent this disease and allied affections, all that is necessary is to keep the cause, the blood-worms referred to, from entering the human body. How can this be done? Simply by acting on the knowledge we possess of the life-habits of those blood-worms during that extra-corporeal and vulnerable phase to which I have alluded, and which is common to all parasites. It so happens that we know, in the case of this particular blood-worm, what this extra-corporeal phase is and where it is passed. We know that every evening these worms are carried by the blood-stream to the surface of the body. We know that certain species of mosquito, when they imbibe the blood, swallow with it the floating worms it contains. We know that these ingested worms, leaving the stomach of the mosquito, enter the thoracic muscles of the insect and therein

undergo a wonderful metamorphosis, a metamorphosis which in due course qualifies them for living as free animals in water. We know that when the mosquito dies, which she does soon after laying her eggs, she falls into the water on which these eggs are deposited; and we know that the blood-worms she contains escape from her dead body and swim about in water as free animals. And we believe, I might say we know, that when man inadvertently drinks this water he swallows the blood-worms, which then pass from his stomach to his tissues, and so start a new colony of blood-worms, and very possibly grave disease. Now, from this piece of knowledge, it is easy to prescribe a dozen simple ways of preventing blood-worm diseases—elephantiasis, for example. We have but to keep the mosquitos down—not a very difficult matter if we set about it the right way; or we have to prevent, by simple means, the mosquitos from preying on already infected individuals; or we have to keep the mosquitos from getting access to our drinking-water; or we have to kill, by boiling or filtration, the larval blood-worms which our drinking-water may contain. Knowledge of the facts of the life-history of these blood-worms, that they are conveyed to man by the mosquito through drinking-water, at once indicates simple and thoroughly effective preventive measures. No one now need suffer from elephantiasis.

I could quote other instances of tropical disease in regard to which knowledge of the life-history of the germ confers on man an absolute power of prevention, a power, moreover, easily given effect to. There is a weak and unprotected point in the life-history of every parasite, and on which, did we but know where it lies, man can place his finger and stay disease.

I wish I could indicate with precision this weak point for the malaria parasite, that germ which, *par excellence*, renders the tropics in many places so deadly, and which is, in fact, the main obstacle of the successful colonization of the tropics by white races. There are signs, however, that the day of deliverance from this worst curse of mankind is at hand. Fact after fact is coming to light about the malaria germ, and step by step we are approaching that complete knowledge of its life-history which alone will enable us to crush out this terrible parasite, or, at all events, to protect ourselves from its attacks. This consummation has been unnecessarily long in coming, thanks to indifference to our true interests and duties. Is it not a strange thing that, though thousands of men can be got to toil unceasingly, to undergo endless fatigue, privation, and danger, to expend brain and muscle and money, merely to unearth some handfuls of yellow dirt or some glittering pebble, yet for this grand work of attaining the knowledge by which we may cope with the malaria beast, so few labourers and such meagre means are forthcoming? I do not believe that in all the world at the present moment there are a dozen men actively engaged in strenuous endeavour to work out the malaria problem, notwithstanding its enormous importance, an importance compared to which the greatest war is as nothing. And yet the problem is not a hopeless one, for, given adequate means and opportunities, its solution is by no means an impossible matter. I think it was Carlyle who said, that if the time and care and effort devoted to the training and turning out of one ballet girl were but devoted to the Irish question, that troublesome political bugbear would be quickly settled. The same might be said of that much greater, much more important problem—the malaria problem.

The successful colonization of tropical lands is entirely a matter of knowledge, and of the application of knowledge. This the Royal Geographical Society, so long the pioneer in scientific tropical travel, cannot fail to appreciate. We may be assured of its sympathy and encouragement in any project having for its object the betterment of the health of the traveller and the colonist in tropical lands. This reflection encourages me to mention that at the present moment some of us are

trying to establish, in connection with that neglected field for the investigation and study of tropical disease—the hospitals and dispensaries of the Seamen's Hospital Society—a school for the practical training of medical men proposing to practise their profession in our tropical colonies. Surely a laudable object, and one which, more than anything I know, would provide us, if carried into effect, with trained investigators capable of advancing our knowledge of tropical disease, and of spreading that knowledge. Yet such is the indifference of the public to this a public duty, that our scheme hangs fire, merely for the want of a few thousand pounds. It languishes in a country whose sons yearly die by thousands from tropical parasites; in a country whose unexampled prosperity is owing to, and depends in great measure on, tropical countries. And yet we are so rich that the Chancellor of the Exchequer does not know what to do with his surplus millions. Worthy objects of benevolence are so scarce, apparently, that the rich have to fall back on starving cats, homeless dogs, and broken-down horses. I wish some of these rich men, conscious of the responsibility of wealth, would recognize that the attainment of a scientific knowledge of the many unsolved tropical-disease problems is a far worthier object for their beneficence than any number of cats or dogs or horses. A few of their surplus thousands would go a long way towards solving the problems of the colonization of the tropics by the white races.

The CHAIRMAN: Perhaps Sir Harry Johnston, who has studied this question on the spot in the tropics, will be able to make some remarks upon the position of Europeans in respect to colonization such as he has observed it in these countries.

Sir HARRY JOHNSTON: My general conclusions, I imagine, are quite those of the reader of this very interesting paper; that one should distinguish as a general rule between the effects of climate and the effects of what I suppose is due to soil and other local conditions independent of, to a great extent, though perhaps created by, the climate. At the same time I think this theory, like other theories, must not be pushed too far. It has often been remarked to me by Europeans in Central Africa, and I have said it over and over again myself, "What a delicious climate, but what a cruelly unhealthy place!" There are many parts of Africa where the climate is disagreeable, where great heat and moisture are combined at the same time; but in much of the interior of Africa, as the Chairman of this meeting knows perhaps better than most people, the climate is delicious. In Dr. Livingstone's book on the Zambezi expedition he remarks, and quotes the remarks of several naval officers, that the climate "is like that of Italy." But I take it that there are germs in the soil—I have often thought perhaps it is because of the land having lain fallow so long, never having been chastened by tillage—there are germs in the soil and water which are peculiarly fatal to Europeans, and which to some extent are also harmful to the indigenous inhabitants of the country. Yet, as I say, the theory must not be pushed too far, because there are many parts of the tropics where the climate causes not only ill health in Europeans who go out for temporary purposes, but also a certain deterioration in the children born there. I have visited India for a few months only, but I confess I came away with the impression that the bulk of those Britons pointed out to me as having been born and brought up there did not strike me as reaching the same high physical and mental standard as those other of their fellow-countrymen who had been born in the United Kingdom. We have not been connected sufficiently long with India yet to be able to speak decidedly on the subject. The number of generations is very limited; but still, although I should certainly be averse to opposing the idea that eventually in tropical countries a European race might take root, I think it would be an inferior race. If we look at the history of the world, we find the great races do not seem to be produced in tropical countries. In most parts of

Australia I am prepared to admit that, owing to the greater dryness of the climate, the heat alone is possibly not an obstacle to successful European colonization without degeneration; but I confess I am unable to give up the idea, much as I should like to do so politically, that in most tropical countries the European settlement of the country would tend to the eventual production of a slightly, and possibly greatly, inferior race. However, it seems to me for practical purposes we need hardly discuss matters so very far ahead, because most tropical countries contain a very abundant native population, and there are obstacles from that reason alone, such as the great competition which would ensue, and our modern ideas of forbearance to our fellow-men of all colours, which make us refrain from pushing those people out of the way to provide room for European colonists. That need will only come when some supreme exigency forces Europeans to set right aside and replace it by might. What we do want is the knowledge of how a limited number of Europeans may *rule* the tropics, because so inferior are all indigenous tropical races that there scarcely remains a single tropical country which is independent politically, or whose independence is not more or less threatened. What we desire to find out is how, without unreasonable loss of life, our fellow-countrymen can govern tropical regions. In some parts of Africa the loss of life is not so alarming; but take British Central Africa—the loss of life there is so great that the gains scarcely balance it, but we have such hope for the future that we are afraid to give in. Therefore, if we could solve the problem of how to live in such a country in reasonable health, the gains, politically and commercially, would be so enormous that we might put aside for the moment the question of whether European races can wholly replace the existing people of the country.

To narrow the issues still further, there are only three diseases we have to combat in Central Africa—they are common malarial fever, and then, in an ascending scale, dysentery, and either yellow fever or black-water fever. I think the problem of how to maintain existence for a reasonable term of years has been practically solved in India. The average health of our fellow-countrymen in India is so good that we can set that question aside as settled. It is so, also, in Ceylon, and likewise in most parts of tropical Asia. But in Central Africa the loss of life is, and will remain for some time, very serious indeed from those three diseases—ordinary malaria, dysentery, and black-water fever. I quite agree with the general tenour of the lecturer's remarks, that these diseases do not spring from climatic effects, but from germs. If we could combat those germs, we should remove the terror that attends visiting those countries. But even in quinine we have found no prophylactic. Quinine cures individual attacks of malarial fever, but the constant taking of quinine does not in the least prevent a man incurring malarial fever, and he may end by suffering from too much quinine. On dysentery it has a less marked effect, and on black-water fever it has no effect at all. We know scarcely anything at present of how to extirpate or neutralize the germs of those three great diseases. As that alone is such a gigantic task, we should obtain better results by applying ourselves first to this practical end rather than to the much vaguer and more distant problem of whether European races will ever be able to colonize tropical countries.

Mr. J. A. BAINES: I did not expect to be called upon to say anything, because the lecture has taken such a scientific form that I feel I can hardly add anything to the discussion. I have, however, spent about twenty years in tropical countries, and have studied the general question of the acclimatization of different races, mostly in India. I have also taken occasion to learn what I could of the mixed races in South America, particularly the Spanish. I cannot say I agree entirely with the deductions of the lecturer as to the success with which these experiments have

been attended. Of course I regard the word "acclimatization" in the sense in which Sir Harry Johnston regards it, that a race must not only live, but be able to reproduce itself quite as efficiently as it does in its own country. If we colonize at all, we do not want to degenerate, but we want to have the same capacity that we enjoy in our own country. Looking at it in that way, the little attempts at acclimatization in India have absolutely failed. I quite agree with Sir Harry Johnston that the country-born British there are excellent people in their way, but both physically and in character they are decidedly below the young men we get imported fresh from England, who serve their generation and go back to their own country without any idea of settling or colonizing. I also agree with what has been said about children. Children, if kept in the tropics, even in the best of highland climates, degenerate after a certain time, and very often come home outgrown physically, and certainly not of the same mental capacity as their compeers at school here. I think the lecturer mentioned the Portuguese. The Portuguese of the west coast of India contain no blood of the Portuguese race at all. A large number of people in the British districts around Bombay have Portuguese names because the people who converted them happened to be Portuguese bearing those names; they won't call themselves Portuguese, but native Christians. The natives of Goa are no more Portuguese than any of the Hindus. On the East Coast of Africa I think there has been undeniable intermixing. The Portuguese habit there has been to intermarry with the native races to such an extent that there is little real Portuguese blood left, and what is called Portuguese is decidedly mixed. If we go back to Europe, I think any one who knows Portugal would say the upper class people are by no means of the same purity of blood as we find amongst the Spaniards or other Latin races. There is a decided mixture among them of Semitic blood, whilst, on the other hand, amongst the peasantry you can find marked traces of their Gothic ancestry. As to South America, I do not agree that the Spanish race in the tropics there has continued either in its efficiency or purity. The Spaniard of America is of a very different sort from the Spaniard of Spain. I must say we have heard a great deal of theory from the speaker behind me, but the question, as it appears to me, exists at present in the region of theory only. All the experiments that have been tried have not led us to believe that they will be successful in raising up a white race in the tropics that will keep up to the European standard of efficiency.

Dr. FELKIN: I should like to say one or two words, although several points to which I intended to refer have already been touched upon. I think that Dr. Sambon should place a limit as to the time when this acclimatization is to take place. If we are to infer from his paper that acclimatization is immediately possible, I do not agree with him; if he means in the distant future, say in four or five hundred years, there is no reason why we should not look forward to acclimatization by Europeans being possible anywhere at that date. In the present condition of our knowledge, I do not think we can contemplate with complacency any attempt to settle a large number of Britons in tropical regions. We can only expect great loss of life and suffering, and the survival of a very few. It is perfectly true, as the reader of the paper remarked, that the inhabitants of the tropics have, in time, passed towards the north, and it is theoretically possible for the inhabitants of the north eventually to regain possession of tropical lands. But I do not think any of us will ever live to see that day, and I cannot help regarding Dr. Sambon's opinions as rather dangerous, unless qualified by a time limit. If we grant that the cradle of mankind was in a tropical centre, from whence man overspread the world, we must not forget that the migration which took place occupied many centuries, and was, as we know, attended by enormous loss of life, only the fittest surviving. In

my view of the matter, notwithstanding the advance of sanitation and personal hygiene, a considerable period must elapse before the reverse process could take place, and the inhabitants of temperate regions re-occupy and become acclimatized in the tropics.

I certainly think the paper ought to do a great deal of good in stimulating research with regard to tropical diseases, and also in influencing the public to acknowledge their duties with regard to the education of medical men proceeding to the tropics. Of course, malaria and other diseases, to which reference has been made, are not fully understood at present, and a thorough investigation of them is essential; and as to the need of a special education before going out to tropical regions, there is no doubt of its importance. I do not mean that this training or teaching can do more than help towards making acclimatization possible—far from it; theoretical teaching and practice are frequently hard to reconcile. In the rough and tumble of life, a man cannot take all the precautions which he knows are advisable, and accidents are therefore inevitable. Still, fore-warned is fore-armed all the world over, and very much is gained by being prepared beforehand. I was only reading this morning that many years ago Max Müller tried to make Macaulay see that Great Britain, which had the largest oriental empire in the world, ought to have a school for teaching oriental languages, just as France, Italy, Germany, Austria, and Russia, had and have. Now we see that these governments are reaping their reward. It is just the same with the knowledge of climatology and tropical diseases. On the continent great attention is given to the subject, and they will have their reward; in this country we let things slide, and we too shall meet the consequences.

Theoretically, acclimatization may be possible, but I do not think that at present it comes within the region of practical politics.

Mr. ALFRED SHARPE: Having lived for the last ten years in Central Africa, I cannot, of course, fail to have formed opinions on the question that has been discussed to-day, and it seems to me that we can theorize as much as we like on this subject, but the fact remains that Europeans continue to die there. The death-rate is very high; and, do what we may, we cannot, as yet, prevent it. There is one point which struck me in the interesting paper which Dr. Sambon read, and that is that he spoke of "heat." I do not know that "heat" has anything to do with unhealthiness in tropical countries at all. The whole question is malaria, so far as Africa is concerned; there is greater heat in Australia than in Central Africa. As Sir Harry Johnston has said, as far as Central Africa is concerned, there are three serious complaints, and if the doctors can find some means either to enable us to prevent those fevers coming or to minimize their effect, then they will have achieved much. It is, in my opinion, impossible for colonists (in the sense of permanent settlers) to do much in Central Africa until we find some means of preventing or curing malaria.

The CHAIRMAN: I think you will wish me to convey to Dr. Sambon your thanks for the able paper he has read, which has given rise to so interesting a discussion. We have heard two views expressed; the first is that which Dr. Sambon advocates, that we have the means of getting rid—if we would only study the subject—of all the difficulties that stand in the way of the colonization by Europeans of tropical countries; the other, that we are a long way off from that result as yet. My experience in Africa has shown me that, apart from the question of health, the white man has to compete with the black man in tropical countries on unequal terms. The black man is the best, because the cheapest, labourer in tropical countries, and I do not see that the white man can ever colonize in face of the black man so as to supplant the latter for unskilled work. The black man needs some

one to guide him, but with such guidance he will always work better, and do more work in the tropics than the white man could do there; so far, therefore, as my experience goes, we can, for the present, only look, as Sir Harry Johnston says, to organizing a governing European class that will rule and guide the black man. Under such rule, whenever it has been applied, we see the black man increasing so rapidly, that the white man would have no chance at all. We know that in America the Spanish race has degenerated, and in India the Goanese have now little or no Portuguese blood in them whatever. I will, if you will allow me, now thank Dr. Sambon for his interesting paper.

Mr. J. W. WELLS: There is one thing I should like to call attention to which seems not to have been noticed in the discussion, and that is the fact that many delicately constituted children become adults in a tropical climate, who in this country would probably never have reached that stage at all. I maintain that the English race, in its days of childhood, has to endure such a series of rapidly changing temperatures and climatic variations, that a Britisher is tempered to live anywhere. An American replied, when he was asked about our climate, "You have not a climate, but you have quite a quantity of samples, and I do not wonder, that provided you can live through these samples, why you can just live anywhere and populate the world." My conviction is that many of the feebly constituted children born, and attaining manhood, in tropical climates, if born and reared in this country, would have ceased to exist at an early age. The consequence is that, in the majority of tropical regions, the existence of feebly constituted inhabitants is rather due to the amenities of the climate rather than as one of its detrimental effects. The British race is an example of the survival of the fittest.

The following letter has been received from Colonel J. C. Gore, Colonial Secretary of Sierra Leone:—

"DEAR SIR,—I regret to say that the notice of the meeting of the 27th instant only reached me on the afternoon of that day. After twenty-five years' experience of the climate of West Africa, I am of opinion that Europeans do not become acclimatized. The only advantage old residents have over new-comers is that they know better the dangers to avoid, and the best means to take in that direction. I consider that an old resident in West Africa is just as likely to be carried off from a bad attack of fever as is one who has just arrived; in fact, the odds are rather in favour of the new-comer, as he is likely to be in better condition. It is a well-known fact that a person who has once had an attack of so-called black-water fever is more liable to have another attack when subjected to the same influences, and that each attack increases the risk he runs when returning to West Africa. I am strongly of opinion that, when once a person has had this disease, he should not be allowed to return to the West Coast. Acclimatization may be possible in other tropical countries, but West Africa is exceptional. I am very much interested in the question naturally, as I am still serving on the West Coast of Africa. I attribute my escape from the effects of the climate to *great good fortune*, and, of course, being very careful in my living."

SURVEY OF INDIA REPORT.

THE report of the Survey of India under review ends with the summer season of 1897. It is consequently rather more than a year old. Why it should be so late in publication is nowhere explained in the body of the report. It was a season of steady hard work and satisfactory progress in all branches of the department, with