

Tropical Colonisation and the Future of Australia.¹

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IN North America the presence of the Negro has introduced problems of inscrutable perplexity; in South America a mixed race is in firm possession; in Africa as a whole the white man has no chance as a colonist; and in South Africa his future depends on some complex measure of segregation. In Asia, only in the north and north-west has the white man any prospect of permanent dominion. In contrast to these restrictions, in Australia the fundamental problem is the possibility of the occupation of the whole continent by the European race.

When the chief inrush of immigrants into Australia occurred after 1850, the belief was almost universal that the natural home of the white man was in the temperate zones and that the torrid zone must be left to the coloured races. That policy was accordingly adopted by Australia and pursued for fifty years. The tropical districts were left open, with varying limitations, to Asiatic immigration. Few Asiatics, however, took advantage of this opportunity, though large numbers were eager to enter the cities and settlements in the south, where the European had done the pioneer work. In the north the Asiatics were a hindrance, as they were too few to help materially, and they were sufficient to discourage the entrance of white artisans.

In 1901 Australia, on federation, found itself faced by two problems—the empty north which the open-to-Asia policy had not filled, and the disturbing effect of indentured coolies on white labour. The policy of excluding coloured people and working the northern plantations with white labour was declared to be a physical and physiological impossibility. In 1907, in opposition to this traditional view, I remarked (“Australasia,” i. p. 15) that “medical authorities on tropical climates seem now, however, to be coming to the opinion that this view is a popular prejudice which does not rest on an adequate foundation.” The evidence to that effect had been stated in a remarkable paper by Dr. L. W. Sambon, and endorsed by the late Sir Patrick Manson, and has been supported by the general trend of medical opinion during the past seventeen years.

The general distribution of mankind is in such close agreement with the rule that the white race has settled in the temperate regions and left the tropics to the coloured races, that any policy inconsistent with that arrangement must be prepared to encounter a strong prepossession to the contrary. Nevertheless, that rule is inconsistent with so many facts that it is not a safe basis for a national policy. In America, for example, the whole continent, except for the Eskimo in the north, was occupied by dark-coloured Mongolian tribes, in which, according to Flower and Lydekker (“Mammals,” 1891, p. 752), “the colour of the skin, notwithstanding the enormous difference of the climate under which many members of the group exist, varies but little.” The most northerly part of Europe is occupied by a coloured race, the Lapps. In Africa the darkness of the skin does not always vary in accordance with distance from the Equator.

¹ From the presidential address, “Inter-Racial Problems and White Colonisation in the Tropics,” delivered to Section E (Geography) of the British Association at Toronto on August 7.

SUPPOSED UNFAVOURABLE FACTORS IN TROPICAL CLIMATE.

(a) *Heat*.—The belief in the unsuitability of the tropics for the white man rests on several considerations. Most importance is naturally attributed to the heat, as that is the essential difference between the tropical and other zones. Intense heat is regarded as injurious to people not protected by a dark skin. That view overlooks the automatic process by which the living body adjusts itself to temperatures even higher than occur in any climate on earth, and that would quickly cook it, if dead. During some experiments by Sir Charles Blagden in 1774, Sir Joseph Banks remained in a room for seven minutes at a temperature of 211°; and Blagden subsequently stayed at the temperature of 260°, while eggs were roasted hard and beefsteaks cooked in a few minutes. White men work in furnaces and bakeries at 600° F., and if they can survive such temperatures even for short spells, they should be able to withstand the hottest climate on earth.

That heat is not the dangerous factor in the tropics is obvious from the well-known fact that the hottest areas are often the healthiest. Agra is hotter and healthier than Bombay; and the summer heat of Colorado is fiercer than that in the less healthy Mississippi Valley.

(b) *Moist Heat*.—As dry heat affords no explanation of the high mortality of some tropical localities, appeal was made to moist heat, and to the combination of heat and moisture marked by a high wet bulb temperature. At any temperature above blood heat the body is cooled only by the evaporation of perspiration, which does not take place in air saturated with moisture. Hence in the Townsville experiments a man placed in a room in which the wet bulb temperature rose from 98° to 102°, fainted in forty minutes. In a hot locality a dose of atropin, which suppresses perspiration, may be quickly fatal.

A wet bulb temperature higher than blood heat would be fatal to men, white or black; but no earthly climate has such temperatures. It was at first suggested that the limit of human activity was the wet bulb temperature of 73°, but there are well authenticated records of miners working for four-hour spells for months at the wet bulb temperature of 80° to 90° in Hongkong, the Straits Settlements, Beaufort in Borneo, and Ocean Island in the Pacific. At all these places people, both white and coloured, survive these conditions. Hence the limit has been gradually raised and it is recognised that men can withstand wet bulb temperatures of 85°, though the power of work under such conditions is necessarily greatly reduced. The highest wet bulb temperature mentioned in Dr. Griffith Taylor's record at Port Darwin is 81°. The wet bulb data for North Australia are scanty; but there seems no reason to expect that any considerable areas have a more uncomfortable climate than Calcutta, to which Dr. Taylor compares the worst localities of tropical Australia. Calcutta is one of the healthiest cities in India, and has a large and vigorous European population, many of whom spend there the whole year.

Moist heat is trying and must be considered in judging

climates from the standard of comfort and personal efficiency. The investigation of wet bulb temperatures, the significance of which was shown by Sir John Haldane, has been developed in reference to the textile industries by Dr. Leonard Hill and Dr. Boycott, to mining by Sir John Cadman, to the conditions of tropical Australia by the work of Prof. Osborne and has been illustrated by the ingenious climographs of Dr. G. Taylor; it has yielded results of high practical value. But the wet bulb isotherm does not delimit the areas where the white man may live and work, and does not really affect the question of white *versus* black colonisation, as there does not seem to be any reason to believe that black men could withstand a higher wet bulb temperature than white men. In answer to an inquiry on this question, Sir John Haldane replied that his impression on the contrary was that "white men can usually stand more heat than black men," and he reported the information given him that in places like the Red Sea the Clyde stokers stand the heat better than the Lascars, "and, in fact, have constantly to carry the latter out and lay them on deck to cool."

(c) *Monotony in Temperature*.—Another temperature factor that has been appealed to is that depressing equability of temperature which occurs on some tropical coasts. Excessive monotony in the weather is no doubt depressing, and temperature changes have a stimulating beneficial effect. Extremes of cold and heat are still more inconvenient and trying, and a moderate equability is often advertised as an attractive feature in a climate. The equability of the oceanic climate is recognised as most favourable for many conditions of health. The areas over which extreme uniformity of temperature prevails throughout the year are, however, so restricted that this factor does not affect the problem of tropical settlement as a whole. With the exception of low tropical islands, places with monotonously equable climates are in positions whence a change may be secured by a visit to some neighbouring hill country.

(d) *Actinic Rays*.—A fourth factor to which much importance has been attached in connexion with the tropical climate is the effect of the chemical rays of the sun. Great importance was once attached to the pernicious influence of the ultra-violet chemical rays of the sun on persons not protected by a dark skin. Residents in the tropics were therefore advised to line their clothes with orange-coloured fabrics to shield themselves from the chemically active rays. These views reached their extreme in the writings of Surgeon-Major C. E. Woodruff in 1905, who held that the actinic rays of the sun are so inimical to the white man that they inhibit his permanent settlement within 45° of the Equator. He therefore regarded the tip of Patagonia as the only area in the Southern Hemisphere fit for white occupation. The temporary stagnancy of the population of Australia after the droughts of 1900–1902 he regarded as evidence that the native-born white Australian and delicate New Zealander were wasting away through physical decay due to the enfeebling sunshine, just as the health of American and European children was being ruined by the "daft" practice, as he called it, of flooding schoolrooms and nurseries with streams of light. Woodruff's conclusions have naturally been disregarded.

Any deleterious effects of the chemical rays of the sun may be avoided by the use of appropriate clothes, and physical considerations suggest that a black skin should afford less protection than a white skin. Any injury that may be wrought by powerful sunshine, according to Aron's work in the Philippines, is due to the heat rays at the red end of the spectrum and not to the chemical rays. The modern lauded system of heliotherapy is based on the belief that strong sunshine is a powerful curative agency.

(e) *Miscellaneous Factors*.—The four previously considered factors have the advantage that they can be readily understood and tested; but as they have failed to provide any basis for the unsuitability of the tropics for the white man, the appeal has been shifted to a complex of tropical influences, including a rise of body temperature, the lessened activity of lung and kidney, and nervous disturbances. Dirt and disease and carelessly prepared food are also mentioned, though they are due to human agencies. The physiological effects of the tropical climate in this indictment are contradicted by high authorities. The rise in body temperature is emphatically denied amongst others by Breinl and Young from observations in Queensland, and by Chamberlain on the basis of extensive observations on American soldiers in the Philippines. A slight rise may occur in passing from the temperate regions to the tropics, but it is soon recovered; and Shackle reports from his experiments on monkeys at Manila that "the healthy white men may be readily acclimatised to the conditions named—that is, to the tropical climate at its worst." Shackle adds that the most important factor in acclimatisation is diet.

The asserted ill-effects of the tropics on respiration appear to have no more solid basis. Prof. Osborne found at Melbourne that the rate of respiration was increased on the hottest days, and his observations agree with those of Chamberlain in Manila. So far from the tropical conditions being injurious to the kidneys, it is asserted, as by Dr. A. B. Balfour, that there is less trouble with that organ in tropical than in temperate climates. The apparently inconsistent observations on the action of the kidneys between various tropical localities and people may be explained by differences in diet.

The remaining charges against the tropical climate are insignificant, or not based on climatic elements, or are indefinite. Some of the alleged factors are trivial, such as the liability to various skin diseases owing to change in the skin reaction; for if the white man allows himself to be kept out of any country by such a cause he does not deserve to get in. The hygienic troubles due to association with an insanitary people are sometimes adduced; but they are not an element in climate and would not operate in a land reserved for white people. The remaining factors rest on ill-defined nervous ailments which are more likely to be due to domestic difficulties than to climate. These nervous troubles fall mainly on the women who have the strain of disciplining native servants into conformity with British ways. Nervous disorders are said to be worst in hot, dry, dusty regions which in the tropics are generally regarded as the most healthy, except to those whose constitutions require a moist atmosphere.

Medical opinion has gone far towards the general adoption of the conclusion that there is nothing in

climate to prohibit the white man from settling in the tropics.

As an example of a recent authoritative verdict may be quoted the report of a sub-committee appointed in 1914 by the Australian Medical Congress to investigate the medical aspects of tropical settlement. After extensive inquiries, the comparison of the blood of children born and bred in the tropics with those of the temperate regions, and other evidence, the sub-committee reported in 1920 as follows: "After mature consideration of these and other sources of information embodying the results of long and varied professional experience and observation in the Australian Tropics, the sub-committee is unable to find anything pointing to the existence of inherent or insuperable obstacles in the way of the permanent occupation of Tropical Australia by a healthy indigenous white race. They consider that the whole question of successful development and settlement of Tropical Australia by white races is fundamentally a question of applied public health in the modern sense. . . . They consider that the absence of semi-civilised coloured peoples in Northern Australia simplifies the problem very greatly."

IMPROVEMENTS BY PUBLIC SANITATION.

The trend of medical opinion to the view that there is no physiological reason why the white race should not inhabit the tropics may lead to a change similar to that regarding some localities in the temperate zones, which were formerly regarded as death-traps and are now popular health resorts. The island of Walcheren, on the coast of one of the most densely peopled countries in Europe and only thirty miles from so fashionable a watering-place as Ostend, had, a century and a quarter ago, one of the most deadly climates in Europe. The largest army which had ever left the British islands landed there in 1809. Napoleon did not think it worth powder and shot. "Only keep them in check," was his order, "and the bad air and fevers peculiar to the country will soon destroy the army." Napoleon's judgment was justified. The force of 70,000 men disembarked on July 31 and August 1. By October 10, according to Sir Ranald Martin, 142 per thousand were dead of disease, and 587 per thousand were ill.

Algeria is now a trusted sanatorium. Yet disease annually swept away 7 per cent. of the French army that conquered it. Sir A. M. Tulloch remarked that if the French Government had realised the significance of that mortality "it would never have entered on the wild speculation of cultivating the soil of Africa by Europeans, nor have wasted a hundred millions sterling with no other result than the loss of 100,000 men, who have fallen victims to the climate of that country." The same change of view has taken place in reference to some tropical localities. The deadliness of the Spanish Main to our armies was described by Samuel Johnson. "The attack on Cartagena," he said, "is yet remembered, where the Spaniards from the ramparts saw their invaders destroyed by the hostility of the elements; poisoned by the air, and crippled by the dews; where every hour swept away battalions; and in the three days that passed between the descent and re-embarkation half an army perished. In the last war the Havana was taken, at what expense is too well remembered. May my country be never cursed with

such another conquest." Yet Havana, under American administration, has become one of the healthiest cities in the world.

Sir John Moore, when Governor of St. Lucia (1796), wrote home that it is not the climate that kills, but mismanagement. His insight has been demonstrated in the same region. The French attempt to build the Panama Canal was defeated by disease. Discovery of its nature enabled the late Surgeon-General Gorgas to secure for the 10,000 men, women, and children in the canal construction camps, in spite of the high humid heat, as good health as they would have had in the United States. Gorgas claimed that the results at Panama "will be generally received as a demonstration that the white man can live and thrive in the tropics." Gorgas realised that the results for the future are even more momentous. He predicted that as "the amount of wealth which can be produced in the tropics for a given amount of labour is so much larger than that which can be produced in the temperate zone by the same amount of labour, that the attraction for the white man to emigrate to the tropics will be very great when it is appreciated that he can be made safe as to his health conditions at small expense. When the great valleys of the Amazon and of the Congo are occupied by a white population, more food will be produced in these regions than is now produced in all the rest of the inhabited world."

THE DEVELOPMENT OF TROPICAL AUSTRALIA.

The experience of colonisation in tropical Australia is limited to about seventy years; but it affords no ground for the expectation that the ultimate effects on the white race will be detrimental.

(a) *Vital Statistics in Queensland.*—In Queensland, most of which is tropical, the death-rate is lower than in any European country and is lower than in most of extra-tropical Australia. In the six years 1915-21, according to the statistics in the Australian Year-book (No. 15, 1922, p. 99), the crude death-rate in Queensland was the lowest in the six Australian States for one year, and fourth of the six States in three years, and the fifth in three; it was not once the highest. In the same six years the infantile death-rate was lowest in Queensland in three years, and the second lowest in two others. According to the same authority, by Index of Mortality (*i.e.* the death-rate in proportion to the ages of the community), Queensland was in 1921 the second State in order of merit, being inferior only by 0.03 to New South Wales, the State most favoured in this respect.

The physical vigour of the Queenslander is shown by his athletic prowess, and by the low rejection-rate of recruits from that State for the Citizen Army. The longevity in Queensland may be judged by the experience of the life assurance offices. It has often been asserted that assurance rates show that tropical climates are unhealthy. Yet the chief actuary for the greatest Australian assurance company, the Australian Mutual Provident Society, reported to the Committee of the Australian Medical Congress, "I have no hesitation in saying that as far as we know at present there is no need for life assurance offices to treat proponents who live in North Queensland differently from proponents who live in other parts of Australia."

Physical and mental degeneration in a people living

under unfavourable conditions would probably be most readily observed in the children. To use this clue I asked the Queensland Education Department whether its inspectors had noticed any unfavourable symptoms among the children in the most tropical of its northern schools. The Department replied that on the contrary its schools at Cairns and Cooktown, two of the most northern towns, are exceptionally efficient, and one of them is sometimes the leading school in the State.

(b) *Northern Territory*.—The great success of Queensland, although more than half the State is within the tropics, renders the more striking the failure of the adjacent Northern Territory of Australia, of which the records are disappointing. Agriculture has declined; the Government demonstration farms have been reduced to native reserves; the meat works have been closed; the population has fallen in numbers; and mining production has become insignificant. The present state of the Territory has been adduced as evidence of the futility of trying to develop a tropical land by white labour. Its failure was not, however, due to the White Australia policy, which was introduced after the failure was complete, but to geographical disadvantages not yet surmounted. The Territory, before 1901, was open to Asiatic immigration, but the hope that it would be adequately peopled from Asia was not fulfilled. Poorness of soil, unsuitable distribution of rainfall, and inaccessibility of position explain its backwardness. Great hopes are based on cotton, but its profitable cultivation appears dependent upon the establishment of a protected cotton manufacture in Australia, which would secure a market for the crop at a price that would pay for the high cost of picking. The remedy for the failure lies not in another attempt with Asiatics, but in the removal of the isolation of the Territory.

(c) *Queensland and the Sugar Industry*.—Queensland in contrast to the Northern Territory has made firm progress; the population has continued to increase; and though at first coloured labour was introduced, the proportion of the Asiatic population in 1911 was only 1.47 per cent., and of the Polynesian only 0.29 per cent.

The numbers of coloured labourers in Queensland were too small seriously to affect the population, but they were sufficient to be a constant irritant and source of uncertainty in the local labour market. This trouble led, in 1900, to the prohibition of indentured coolie labour throughout Australia. This decision was supported by the great majority of the Queensland people in spite of the most emphatic warnings of disaster.

The Australian adoption of white labour for its sugar plantations has been the greatest contribution yet made to the practical solution of the problem whether the white man can do agricultural work in the tropics. The experiment shows that white labour can be employed successfully in such an ultra-tropical industry as sugar cultivation in even the ultra-tropical climate of the Queensland coastlands, provided the settlers are protected from infectious disease and from the competition of people with lower standards of life.

DRAWBACKS OF THE TROPICAL CLIMATE.

The conclusion that white settlement of the tropics is possible should not lead to the drawbacks of a tropical climate being overlooked. The conditions where the

wet bulb temperatures are high are uncomfortable and unfavourable to mental and physical activity. People who are not keenly interested in their work should avoid the tropics. Ellsworth Huntington in a valuable series of works has directed attention to many facts which show the dependence of Western civilisation on the stimulating nature of the temperate climate, for the frequent changes in temperature and wind are conducive to alertness and general efficiency.

The enervating effect of the tropical climate is no doubt counterbalanced by various compensations. Man needs less in food, fuel, clothing, and housing, while the same amount of exertion will produce a more luxuriant and valuable crop. The supremely fertile tropical regions have, however, usually a hot muggy climate, which is not attractive to Europeans while areas with less trying conditions are available. Northern Australia, even if it were not hampered by a high proportion of poor land, would naturally develop slowly, just as in Canada the Northern Territory and the rocky backwoods have lagged behind the St. Lawrence basin and the rich-soiled western plains.

CONCLUSION.

The conclusion that the white man is not physiologically disqualified from manual labour in the tropics and may colonise any part of Australia simplifies inter-racial problems, as it provides an additional outlet and spacious home for the European race.

The preceding survey of the position where the three main races meet in intimate association indicates that the world will have a happier and brighter future if it can avoid the co-residence in mass of members of the different primary divisions of mankind. Individual association and contact should secure for each race the benefit of the intellectual, artistic, and moral talents of the others; while industrial co-operation should aid each nation to make the best use of the land in its care.

The world has reached its present position by the help of each of its three great races, and it still needs the special qualities of each of them. The contemplative Asiatic founded all the chief religions, the ethical basis of civilisation. The artistic Negro probably gave the world the gift of iron, the material basis of civilisation. The administrative genius of the European race has organised the brain power of the world to its most original and constructive efforts. The affectionate, emotional Negro, the docile, diligent Asiatic, and the inventive, enterprising European do not, however, work at their best when associated in mass. That association is attended with serious difficulties; for race amalgamation, which is the natural sequel, is abhorrent to many nations, and the intermarriage of widely different breeds, according to many authorities, produces inferior offspring. The policy of co-residence with racial integrity has failed to secure harmonious progress in North America and South Africa. The development of the best qualities of the three races requires their separate existence as a whole, with opportunities for individual association and co-operation.

In view of the inter-racial difficulties that have developed wherever the races are intermingled, Australia will throw away a unique opportunity if it fails to make a patient effort to secure the whole continent as the home of the white race.