

R.A. DOUGLAS

DR ANTON BREINL AND THE AUSTRALIAN INSTITUTE
OF TROPICAL MEDICINE*

One of the inconvenient features about Australia, when it was first settled, was the irrefutable fact that 40% of the country lay in the tropics, and most of the rest was subtropical. How could one colonize with white colonists a continent which all conventional wisdom regarded, as far as its tropical part was concerned, as likely to prove deadly to the Colonists and to their descendants?

Hence, at the turn of the century there were the seemingly irreconcilable ideas that the white man could not colonize the tropics, and the White Australia Policy which had become law in 1901 through the *Immigration Restriction Act*. In medicine, however, the latter third of the century had shown an enormous increase in knowledge so as to constitute a complete revolution in infectious diseases, and nowhere was this more evident than in the diseases common to the tropics. In 1877 Dr Joseph Bancroft, of Brisbane, discovered the adult filarial worm in a patient, and in the same year Sir Patrick Manson identified the *Culex* mosquito as the vector of *Filaria*, the first time an insect cause of disease had been detected (this was a completely revolutionary idea). In 1881 Dr Carlos Finlay expressed the view that yellow fever was carried by the *Stegomyia* mosquito, this was later proved to be correct. In 1880 Dr Alphonse Laveran discovered the malaria parasite in the blood of patients, and in 1897, Sir Ronald Ross linked the *Anopheles* mosquito to the transmission of malaria. In 1894 Sir David Bruce discovered *Trypanosoma brucei*, a representative of a whole new class of parasites, and then in 1903, with others, worked out that *Trypanosoma gambiense* was the cause of sleeping sickness, and that it was carried by the tsetse fly. Incidentally it should be remembered here that at various times Dr Anton Breinl suffered from malaria, and also had yellow fever and sleeping sickness.

These marvellous discoveries led Sir Patrick Manson, who had spent many years in China, to the belief that special research institutes should be set up to study tropical diseases, and to instruct doctors in their management. This genius of a man had returned to London from Hong Kong in 1890 and set about trying to improve the study of tropical medicine. He pointed out that London was the centre of the greatest empire that the world had ever known, and for 300 years a large part of it had lain in the

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tropics, in spite of which there were no facilities for investigating or teaching about tropical diseases. Manson became medical adviser to the Secretary of State for the Colonies in 1897. The Secretary of State at that time was Mr Joseph Chamberlain, who had previously been a Radical Liberal, but was now a Liberal Unionist. This far-sighted statesman immediately saw Manson's point of view, and most expeditiously arrangements were made to found two schools—namely, the Liverpool School of Tropical Medicine, and the London School of Tropical Medicine, both of which opened in 1899, the Liverpool School a few weeks before the London School. Doubtless the Liverpool School was necessary, because Chamberlain was a midlands politician. The fashion having been set, everybody got on the bandwagon, and institutes were opened in Hamburg in 1900, in Belgium in 1901, and later in Paris, Bordeaux, Marseilles, Italy, India, and the U.S.A.

Australia was, and still is, largely a derivative society, so what others had we also wanted, and the matter was first raised by Dr F. Goldsmith, a South Australian practising in Darwin. In delivering a paper at the Inter-colonial Medical Congress of Australia in Hobart in 1902, he pointed out the necessity for the study of tropical medicine in Australia. Goldsmith was influenced by Manson as he said that he had known Manson well in the first two to three years of this century.

Dr R.A. O'Brien now enters the scene. He graduated in Melbourne in 1902 and practised in Cairns from 1904 to 1910, when he left for England; he was the first in Cairns to use a microscope to identify malaria parasites. O'Brien would have been aware of the recommendation of the Hobart Congress, that it would be advisable to found an Australian institute for the study of tropical medicine, and this idea was implanted in the mind of Dr Frodsham, Bishop of North Queensland, by O'Brien in the year 1907, during a long talk they held in Cairns. No doubt the bishop had been aware, over the preceding five years since his consecration, of the prevalence of tropical disease in his diocese, and of the need to remedy matters. He also had a personal interest in the question, as his two daughters had suffered from some unknown type of fever, and the family governess had died from the same illness. This supplied motive enough for him perhaps, to display the extraordinary energy that he did in securing the establishment of the Australian Institute of Tropical Medicine.

It took the bishop only two years to accomplish his object. He seems to have known a lot of influential people, and at the dinner held to welcome Dr Anton Breinl, early in 1910, the bishop especially mentioned the State Governor, Lord Chelmsford, and Sir Charles Lucas, the Secretary of State for the Colonies in London. He also mentioned Mr W.K. D'Arcy of Rockhampton, who made the highest contribution of all to the Institute—namely £1,000, which in those days was a great deal of money. The Townsville institute was the first institute of medical research in Australia, antedating the Walter and Eliza Hall Institute in Melbourne by six years. It is interesting that a large part of the financial sinews for the foundation was

contributed by a Rockhampton man, and of course the Halls of the Hall Institute also came from Rockhampton. So Rockhampton "grub-staked" the first two institutes of medical research in Australia.

The institute in Townsville was to be modestly staffed with one medical officer at a salary of £400 and a working assistant at £100, and incidental expenses would be £200 (a total of £700 a year). The estimate was made by Professor Anderson Stuart. The bishop secured the agreement of the deans of the medical schools of Adelaide, Melbourne and Sydney, that a tropical institute was needed. In fact, Professor Anderson Stuart, the Dean of the Sydney University Medical School, had had similar ideas for some time to site an institute in Sydney. However, the bishop favoured Townsville.

With such a small institute it was envisaged that most of the investigational work would be done on specimens sent to the laboratories of the medical schools in the south. Professor Anderson Stuart never favoured the idea of using Townsville, but did defer to the bishop, so that agreement was reached to site the institute in Townsville—at that time having a population of 10,000 people. The professor threw himself wholeheartedly into the establishment of the institute, but never changed his belief that it would have been better placed in Sydney with a large port dealing with tropical countries. He pointed out that the British institutes flourished even though they were much further away from the tropics than was Sydney. The Townsville group thought that, for obvious reasons, a tropical institute should be situated in the tropics, and in May, 1907, a deputation from the Townsville Chamber of Commerce and Townsville Hospital Committee waited upon the Governor General, Lord Northcote, whilst he was in Townsville. The spokesmen were Dr T. G. Ross, Medical Superintendent of the Hospital and one of the bishop's most ardent supporters and the bishop himself. Dr Ross mentioned the general prevalence of malaria, hookworm, plague, leprosy, and "Barcoo rot", and of eye disease in Cloncurry. The bishop mentioned that the hospital committee had made certain concessions, and this doubtless referred to the provision of a small building to house the institute, and also the making available of ten female and ten male beds for the accommodation of patients with tropical diseases.

Another man who was as remarkable in his way as was Sir Patrick Manson, so far as ever-widening spheres of influence were concerned, was Sir Charles Martin, an Englishman with a marked influence on Australians. He was more or less a medical patron saint of Australia from about 1890 to the time of his death in 1955. He was held in great esteem and affection, and if any problems arose C.J. Martin was always the man first consulted about them.

Sir Charles Martin arrived in Sydney in 1890 as a demonstrator in the university department of physiology, where he spent six or seven years, and then became Lecturer in Physiology at the University of Melbourne. After four years he succeeded to the professorial chair in the subject. R.A. O'Brien was one of his students in Melbourne, as well as working with him

later at the Lister Institute. Many Australians must have passed through his hands as students, as he later returned to Australia in 1931 to become a member of the CSIRO and also Professor of Biochemistry and General Physiology at the University of Adelaide.

Sir Charles Martin had an unusual attitude to the tropics for the time; he was positively in favour of warm climates. He wrote: "Man in his nakedness and the wide area over which he can sweat, is the best adapted of all creatures to withstand high external temperatures, and, coincident with his loss of hair, his increasing intelligence has allowed him to extend the downward range of external temperature at which he could remain homoeothermic by providing himself with adjustable insulation." There is another quotation from Martin: "the correct dress for the tropics is a pair of thongs and a parasol". Is there any wonder that students of his such as R.A. O'Brien ended up in Cairns? Perhaps he was responsible for the steady stream of Melbourne graduates who came to Queensland: perhaps even Jackson himself was influenced by him. Martin's attitude thus constituted the third attitude of the triad. Which of the three was correct? The tropics are harmful; the tropics are the same as anywhere else; the tropics are beneficial so far as the white man is concerned.

When the time came to appoint a director of the new institute, Sir Charles Martin of the Lister Institute was of course involved, as he was in most things Australian. He acted on behalf of the University of Sydney, which was chosen to make the appointment. The selection committee comprised representatives of the Royal Society, the London School of Tropical Medicine, and the Liverpool School of Tropical Medicine.

On August 6, 1909, Martin wrote to Dr Anton Breinl, telling him that he had been appointed to the position of Director of the Australian Institute of Tropical Medicine, with the one proviso that, as he had been infected with *Trypanosoma gambiense* two years previously, any recurrence of this infection would make the appointment null and void. Martin remarked that the committee had secured a "very strong man for its first Director". Dr Anton Breinl was at that time Director of the Runcorn Research Laboratories, and Assistant Lecturer at the Liverpool School of Tropical Medicine.

Doctor Anton Breinl was born in Vienna in 1880. The family lived in the town of Graslitz near Pilsen in Bohemia, and was of Sudeten German origin. His medical education was received at the University of Prague, and he took the degree of M.U.Dr (*Medicinae Universalis Doctor*) of Prague in 1904. In May of that year he came to England and did the course at the School of Tropical Medicine in Liverpool. Later, in a lecture to the Townsville Rotary Club, he gave as his motive for taking up tropical medicine the desire to travel, and also his interest in science. He always described himself as a scientist, and headed his lecture "Personal experiences of a Scientist in different parts of the world". He had enough money to last him for three months when he arrived in Liverpool, and on July 31, 1904, received the certificate of the school signed by Professor Ronald Ross, who later became

Sir Ronald Ross. Breinl always kept a volume of Ross's poems in his possession throughout his life. In fact, in spite of his medical eminence, Ross fancied himself more as a poet and mathematician than as a medical scientist. On August 20, 1897, he discovered the malarial cycle in mosquitoes and thereafter always called it "Mosquito Day".

Breinl also was artistically gifted, but as a musician. His family was associated with the manufacture of wooden musical instruments and also lace. It is said that Breinl was so talented that he could have become a professional concert violinist. He was also gifted at languages, and spoke English and German fluently, and French fairly well, and he also had some knowledge of the Portuguese and Italian tongues.

Breinl, having received his certificate and now being out of money, had the good fortune to be elected the J.W. Garrett International Fellow of the University of Liverpool from 1904 to 1907. During this time he was associated with Dr H. Wolferstan Thomas in research on trypanosomiasis, directed particularly to the pathology and treatment of sleeping sickness.

The Liverpool School of Tropical Medicine was founded in 1899; Alfred Jones, Head of the Elder Dempster Shipping Line, provided the money. Ronald Ross was the Professor of Tropical Medicine, and was paid £250 a year. The school was most active in sending expeditions to investigate tropical diseases throughout the world, but mainly in South America and Africa. Thirty-one expeditions were sent out up to 1914.

It was now Breinl's turn to go on an overseas mission, and in August, 1905, he and Dr H. Wolferstan Thomas were sent as members of a yellow fever expedition to Manaos, 1,000 miles up the Amazon River in Brazil. There is some slight evidence that Breinl may have even gone to Iquitos, 2,330 miles up the Amazon. Before he left Liverpool he insured his life, and in rough notes we can still sense the dread: "Thomas got it first." The "it" was yellow fever, that particular strain having a mortality rate of 95%. Breinl then got the disease and was very severely affected. There may have been a complicating bacterial septicaemia, as numerous abscesses appeared and had to be opened under brandy as an anaesthetic. As a result of this illness, Breinl was left with a left facial palsy and sweating on that side of his face when he was eating—this caused him a good deal of embarrassment. Thomas also recovered, but Breinl spent only six months in Manaos, being evacuated back to Liverpool. The ship was wrecked near the mouth of the Amazon, and all the records and apparatus were lost; his only remaining possessions were his pyjamas and a toothbrush.

Breinl was promoted to be the Director of the Runcorn Research Laboratory in May, 1907. His research there was directed towards tick fever, sleeping sickness, and the life cycle of *Piroplasma canis*. Altogether while at Liverpool he was associated with the production of 21 published papers and one book.

Probably his most significant achievement was in the treatment of sleeping sickness. Thomas and Breinl were the first to try an organic arsenical. They used Atoxyl, a product of the German dye industry which had

been available since 1900, and was used for skin diseases and anaemia. Thomas resolved to try Pentavalent Atoxyl in trypanosomiasis in 1905, and to Thomas and Breinl belongs the credit for having, after careful investigation, introduced the drug as a curative agent in sleeping sickness.

At that time Dr Paul Ehrlich of Germany was also working on the chemotherapy of trypanosomiasis, and on hearing of this work came over to the Runcorn Laboratory to see the results. Ehrlich then resolved to try organic arsenicals in the treatment of syphilis, and by 1907 had developed salvarsan (606), a trivalent arsenical which cured syphilis, one of the most dreaded diseases at the time. Ehrlich did not announce his success until 1910. Hence, these three—Thomas, Breinl and Ehrlich—were the pioneers of the present enormous subject of chemotherapy.

In applying for the Townsville position, Breinl secured a testimonial from Paul Ehrlich. In fact there were eight testimonials.

Ronald Ross in his certificate wrote: "I now merely give Dr Breinl a formal certificate to the effect that his conduct throughout has been entirely satisfactory, and that his capacity as a teacher, research worker, and administrator of his department is of the highest." The other testimonials and certificates mentioned his great capacity for work, which was always subsequently noted, and his popularity with students and staff.

The development of Atoxyl treatment at that time was indeed fortunate for Breinl, as in 1907 a rat, experimentally infected with trypanosomiasis, bit his finger and he contracted the disease, hitherto always fatal. Among his papers is a temperature chart showing the dramatic effect of Atoxyl, while on the back of the chart scientific observations concerning the course of the disease and the medication are written in Breinl's handwriting.

Breinl arrived in Townsville to take up his appointment on January 1, 1910. In that same year he was awarded the Mary Kingsley Medal of the Liverpool Institute. He was given a small timber, iron-roofed building by the Townsville Hospital which had previously been a wardsman's quarters. This building was about 30 feet by 18 feet, and was divided into three rooms. An eight-feet wide verandah surrounded the building. Mr J.W. Fielding, the laboratory assistant, described the arrangements as being even less pretentious than their cottage laboratory at Runcorn from which they had come. Fielding arrived by separate ship about the middle of January, 1910. Fielding remained with the institute from its inception until he died in 1954. At the suggestion of Mr J.E. Claffey, Fielding wrote a manuscript account, totalling 120 foolscap pages, covering the history of the AITM from its inception to the time of its transfer to Sydney in 1930. The manuscript is a mine of information, giving the names of all members who ever served on the staff, including some biographical details, and also a bibliography of all the publications that emanated from the institution. Fielding was paid £100 a year.

The Director, on the good principle that time spent in reconnaissance is seldom wasted, set out to survey the health problems of his wide terri-

tories, and in 1910 made two journeys to the north including Torres Strait. Also, of course, he had to go to Brisbane to meet the leaders of the profession there. It was there that he met Dr E.S. Jackson, whom we commemorate in this lecture. Jackson was the doyen of the profession and was held in great regard and affection.

Breinl asserted that the success of the AITM would depend upon wholehearted cooperation from the profession in Queensland. He had already surveyed some of the Queensland problems, and mentioned how different Queensland was from other tropical countries, in that there was no large reservoir of disease in a numerous native population. He thought the institute should investigate the existing diseases. He said there was a great deal of filariasis, the importance of which seemed to be underestimated. A certain amount of benign tertian malaria was present. Tropical dysentery was rare, but sprue was common, particularly in the Innisfail district. Dengue fever was common, beriberi was frequently seen among the divers and crews of the pearling boats at Thursday Island, and hookworm infestation was prevalent. Diseases of the eyes were common throughout Western Queensland. He stated that a good many other diseases also occurred, such as ulcerative granuloma, indefinite fevers, typhoid of a peculiar type, leprosy, and many more. He was worried lest yellow fever be introduced, as the mosquito vector was present all along the Queensland coast from Torres Strait to Brisbane. Tropical medicine was regarded by him as being concerned not so much with treatment, as with prevention of disease. He pointed out in particular the great strides made by the Americans at Panama.

Breinl mentioned that there was a further aspect to the institute, namely . . .

. . . the White Australia question, which is certainly more than a simple political question in Tropical Australia, but which has a great bearing on the economic development of the world. Is the white race capable of propagating and living in the Tropics? Is the offspring as healthy and fit as in a temperate region? North Queensland is the ideal country to investigate and decide these questions, as it is a tropical country, without native servants, where the white men live under analogous conditions to those in a temperate climate. Does the white organism undergo any changes with regard to composition of the blood; does the metabolism become changed?

In 1911 Professor W.A. Osborne, Professor of Physiology at the University of Melbourne, visited the AITM to make a report on its activities, and advised that the scope of the institute should be enlarged. Dr J.S.C. Elkington, who had taken up duties as Commissioner of Public Health for Queensland on the same day that Breinl commenced duties at the AITM (January 1, 1910), had been on the AITM Committee from the outset, and was in favour of expanding the institute. Cilento knew him well and said of him: "In Elkington it was an absolute belief in the capacity of the white race to colonize the tropics—at a time when the idea was held universally to be absurd—and an all-consuming urge to force it into recognition."

In April, 1911, F.H. Taylor took up duties as entomologist—his salary was paid by the Queensland Government. In September, 1911, the AITM Committee, Dr J.S.C. Elkington being present, met in Sydney and decided to approach the Federal Government for an increased subsidy to widen the scope of the work to include investigation into physiological and anthropological problems associated with the white population living under tropical conditions. The committee was successful with its representations to the Commonwealth Government, and it was decided to build a new laboratory and animal house. For this purpose the Townsville Hospital Board decided to hand over portion of their land. Mr Jacob Leu was President of the Hospital Board. Authority to draw up plans for the new buildings was received by Breinl in 1912.

Professor T. Anderson Stuart and Professor H.B. Allen, from the universities of Sydney and Melbourne respectively, attended a Congress of Empire Universities in London in 1912, and while there, both being on the committee of the AITM, appointed the following members to the staff: Dr W. Nicoll as parasitologist, Dr W.J. Young as biochemist; and Dr H. Priestley as bacteriologist. Young was later to become Professor of Biochemistry at the University of Melbourne, and Priestley Professor of Biochemistry at the University of Sydney. Priestley was to write Breinl's obituary in the *Australian Journal of Science* in 1944.

The new buildings were occupied some time before the official opening on June 28, 1913, which was performed by Sir William MacGregor, Governor of Queensland, a medical practitioner himself with a high reputation for work in tropical countries.

In his opening address the Governor mentioned the plight of women in the tropics:

With the disappearance of the Aboriginal race, with a prohibition on other domestic servants of colour, and the practical impossibility of obtaining white servants, it should not be expected that the mother of young children can live in the north in a house, the walls and roof of which are of galvanized iron, where she has to do the cooking, the washing, the mending and the ironing of clothes, and to tend to the ceaseless round of domestic duties early and late inseparable from the family household. It is therefore absolutely essential that everything that is possible be done to lessen the labour of the white woman in the north and make her life more comfortable.

The enlarged institute busily engaged itself in research on many aspects of tropical disease and tropical living. Much effort was also put into the identification of the parasites of various native and domestic animals, and to research into diseases of veterinary importance. As a result a new genus of filaria affecting marsupials was discovered and called *Breinlia*. There were many others discovered.

In Breinl's time (from 1910 to 1920) 57 published scientific papers were recorded; Breinl either wrote or played a part in writing 22 of these papers. Towards the end of his time his main interest was in the physiological study of the effects of a tropical climate on Europeans. In these

studies, he and Young collaborated, and they were the first in the world after Haldane in England to undertake such investigations. They were helped very generously by the local waterside workers, who acted as the guinea-pigs for their experiments.

The War of 1914-1918 really led to Breinl's downfall as a scientific investigator, and to his rebirth and metamorphosis as a clinician. Before the onset of the war, he became a naturalized citizen in May, 1914. The Superintendent of the Townsville General Hospital left early for the war, and Breinl volunteered to take his place as well as acting as Director of the AIMM. Breinl performed the duties of hospital superintendent, largely clinical in those days, for the greater part of the war in a purely honorary capacity. Breinl was also responsible for treating many servicemen sent from New Guinea, and later from the Jordan Valley with difficult-to-treat malaria. He had an Australia-wide reputation in the management of this disease. Nevertheless, there was a constant sniping campaign carried on by some sections of the populace against Breinl as an ex-enemy alien being in the responsible position that he held.

The war years were busy ones for Breinl, and he was always a great worker. He carried on with his research activities as well as his clinical duties. All this time he had remained single, living in Dean's boarding house on Stanton Hill, only a few hundred yards away from the AIMM. Every Saturday he would have dinner with Dr and Mrs E. Humphry, who remained lifelong friends. Humphry helped him with the hospital work during the war.

On April 21, 1919, however, Breinl married Miss N.D. Lambton, a nursing sister at the Townsville General Hospital. She was a skilled pianist and used to accompany him when he played the violin, and this is how they became acquainted. Later in the year premature twin sons were born, both of whom became doctors.

By this time, however, Breinl had no security of tenure of his appointment, and resigned on October 30, 1920. Before his resignation he gave the opening address at the eleventh session of the Australasian Medical Congress held in Brisbane on August 27, 1920. Breinl's conclusions were based on 11 years' work. He entitled his paper "Figures and Facts Regarding Health and Disease in Northern Australia Influencing its Permanent Settlement by a White Race". The conclusions were as follows:

(1) From the incidence of disease, other than Tropical, North Queensland does not differ from Central or Southern Queensland.

(2) Tropical Diseases with the exception of Hookworm infection are scarce and easily controlled.

(3) Investigations into the physiology of the inhabitants of the Coastal areas of North Queensland, when compared with those of a temperate climate showed only a few quantitative but no qualitative changes.

(4) The investigations carried out had not brought to light any facts indicating that health and disease as prevailing in North Queensland should make permanent settlement by a white race impossible.

After his resignation, Breinl commenced general practice in Townsville, and immediately obtained a large practice as witness to his popularity; he remained in practice until shortly before his death. War had ruined his career as a medical scientist, but had given him the necessary training to carry on with clinical work. Like Jackson, Breinl was interested in educating nurses, and delivered the lectures on midwifery to the trainees at the Townsville General Hospital until his death. He also acted as consulting physician for North Queensland, and had a very high reputation in this regard. During a prolonged trip abroad in 1928 he engaged in postgraduate work, mainly in Vienna, and became interested in radium treatment. He conducted the Radium Clinic at the Townsville General Hospital until his death. In the late 1930s, as the result of a routine medical examination for insurance purposes, he was found to have marked hypertension and albuminuria, and by 1944, at the age of 64 years, he was dead from renal failure. As evidence of the high regard in which he was held, he was flown to Sydney by flying boat in his last illness; in the middle of the war, it was very difficult to get a place on one of those flying boats. He was able to see his two medical sons in Sydney before his death.

Professor H. Priestley wrote his obituary. In it he stated:

Breinl was primarily a protozoologist, both pure and applied, and as such was held in high regard in Europe before he came to Australia . . . It is a great tragedy that Breinl felt compelled to give up active scientific research at the height of his career. Breinl was a splendid man to work with, enthusiastic, very hard working, and always ready to give the other fellow more than his share of the credit. His knowledge of protozoology in particular, and of tropical medicine generally was great, and as a laboratory technician, he was superb."

What of his institute? Dr Cumpston managed to transfer it to Sydney in 1930. For various reasons it was felt that the institute could do better work in Sydney, and the report of the Royal Commission on Health in 1926 recommended that the AIM be incorporated into the School of Public Health and Tropical Medicine of the University of Sydney. Cumpston was thus able to concentrate his forces in the south-east corner of the country, where his interests mainly lay. It was here that the battle with the States for control would be, and is still being fought.