

HISTORY OF THE SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH

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ESTABLISHMENT

One of the first laboratories to be established in the Transvaal was that of the Republican Government, which was set up in Pretoria for the purpose of carrying out gold assays. Following the conclusion of hostilities and the end of the Anglo-Boer War, this laboratory was transferred to Johannesburg where additional duties were laid upon it. It was now divided into two sections, one chemical and the other bacteriological, and the name was altered to the Government Chemical and Bacteriological Laboratories. A little wood and iron building was erected on the corner of de Korte and Hospital Streets and there, for many years, functioned the only laboratory services available to the medical profession in the Transvaal (Fig. 1).

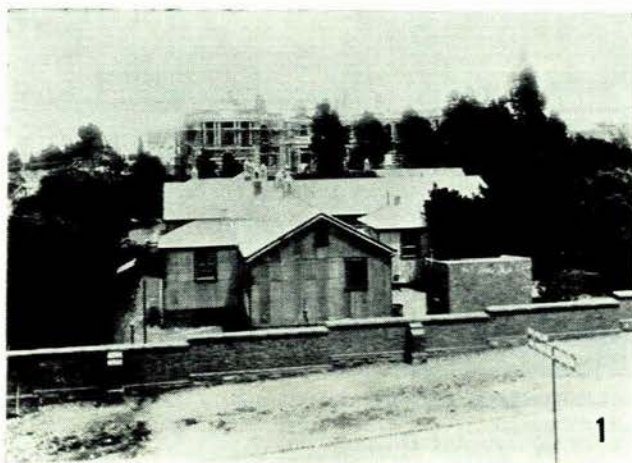


Fig. 1. The Government Chemical and Bacteriological Laboratories, Johannesburg, 1914, with the new buildings of the Institute in the background.

With the expansion of the gold-mining industry and the increase in the number of native labourers employed on the mines, pneumonia, meningitis, scurvy, hookworm, tuberculosis, typhoid and silicosis became pressing problems.

In 1911 the government of the newly established Union of South Africa was requested to improve laboratory facilities so that the medical problems of the gold-mining industry could be investigated and ways and means devised for the prevention and cure of industrial diseases. The government, though fully sympathetic, felt that these diseases were peculiar to the industry and that public funds could not be diverted to their control. Further representations were made to the government, and after the lapse of a year the influence of such prominent men as Dr. Samuel Evans, Mr. P. Ross Frames (Fig. 2), Sir Julius Wernher and Sir Lionel Phillips persuaded the government to accept a revised proposal. It was agreed that a new laboratory would be built which would be controlled by a Board and would not be a government responsibility. The present chairman of the Board is Mr. P. H. Anderson (Fig. 3).

Once government consent had been given matters moved

quickly. It was agreed in 1912 that the South African Institute for Medical Research be established jointly by the Government of the Union of South Africa and by the Witwatersrand Native Labour Association (acting on behalf of the Transvaal Chamber of Mines) for the purpose, primarily, of carrying out 'researches and investigations with a view to the prevention and treatment of human disease'.

The government donated the ground on which the Institute now stands, while the cost of the building, the



Fig. 2. Mr. P. Ross Frames, first Chairman of the Board.



Fig. 3. Mr. P. H. Anderson, present Chairman of the Board.

equipment, and the laying out of the grounds was borne by the Witwatersrand Native Labour Association. On this ideal site, adjacent to the Johannesburg General Hospital and not far from the city itself, the foundation stones, one inscribed in Dutch and the other in English, were laid on 23 April 1913 by Sir Kendal Franks, then president of the South African Committee of the British Medical Association. The buildings (Fig. 4) were designed by Sir Herbert Baker and carry to this day the distinctive marks of his genius in their beauty and perfect proportions. In keeping with the handsome buildings a magnificent set of wrought-iron gates, locally made and an enduring tribute to South African craftsmanship, were erected at the east entrance. These gates contain, in their scroll work, the Union Coat of Arms, the letters WNLA (Witwatersrand Native Labour Association), TCM (Transvaal Chamber of Mines) and SAIMR (South African Institute for Medical Research) (Fig. 5).

DEVELOPMENT

Each of the sponsors of the newly established South African Institute for Medical Research made an annual grant towards the support of its Research Division and has continued to do so to the present day. Although these grants have, of recent years, been somewhat increased, the Research Division has grown to such an extent that other sources of income have had to be found. No small part of the annual deficit on research expenditure, from the earliest days of the Institute, has been met by the turnover of the Routine Division. This Division grew out



Fig. 4. The Main Building, Johannesburg, 1962.

of the obligation laid upon it of continuing the bacteriological and other diagnostic laboratory services previously rendered by the Government Chemical and Bacteriological Laboratories. As medical services in the Union grew there was a proportionate increase in the demands made upon the routine diagnostic services rendered to the central and provincial governments, municipalities, mining and other industries, and private practitioners.

Routine Diagnostic Division

Because of the limited range of laboratory tests then in common use, the Institute was able, in its early days, to conduct a centralized laboratory service. With the increase of medical knowledge and an ever-growing range and complexity of laboratory tests, this type of service rapidly became inadequate and steps were taken to decentralize the laboratory. Before World War II this development proceeded slowly. A branch laboratory was established at Port Elizabeth in 1930 (Fig. 6) and another at Bloemfontein in 1942 (Fig. 7), but the outbreak of war interrupted this development and no further steps in this direction were taken until 1953.

During World War II the full resources of the Institute were turned to the war effort. The Director of the Institute became the Director of Pathological Services to the Armed Forces. Mobile laboratories, which had been designed at the Institute, were staffed by professional and technical personnel from laboratories throughout South Africa. These laboratories (Fig. 8) served the South African army throughout its campaign from Kenya through Abyssinia to the Western Desert, and were finally disbanded in Italy.

Training courses for army medical technicians were conducted at the Institute at intervals throughout the war, and it is interesting to note that several of the specialist pathologists in South Africa today owe their interest in this field to the training they received as technicians during the war.

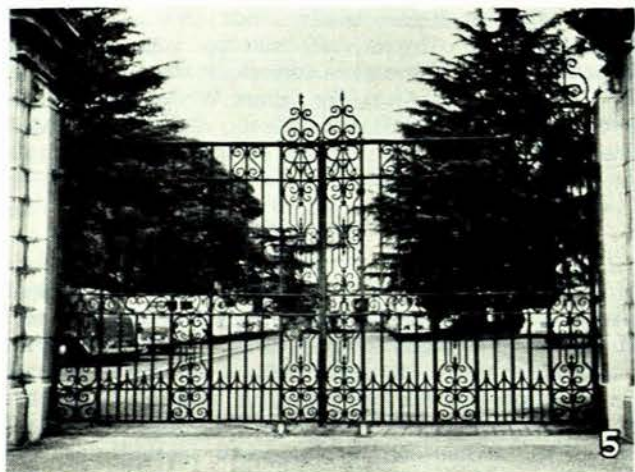


Fig. 5. The East Gate of the Institute showing the Union Coat of Arms and the initial letters of the founder bodies.



Fig. 6. First Branch Laboratory — Port Elizabeth 1930.



Fig. 7. Second Branch Laboratory — Bloemfontein 1942.

Dr. (Capt.) Francis Gray, one of the senior Institute pathologists serving with the mobile laboratories, was one of the many who gave his life for South Africa in the Western desert (Fig. 9).

After the war, in conjunction with the Health Divisions of the Provincial Administrations in the Transvaal, Orange Free State, Cape, and South West Africa, 28 branch laboratories were established. Over half of the routine diagnostic work of the Institute is now carried out in these branch laboratories, while the central laboratory serves the Johannesburg General Hospital and also acts as a reference centre. Scattered as they are in 28 branch laboratories, the central laboratory, and the Rietfontein

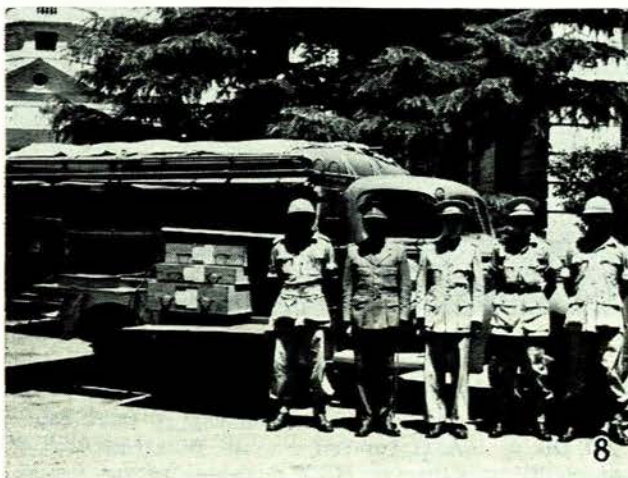


Fig. 8. A Mobile Military Laboratory — 1942.

serum farm, it is impossible to obtain a picture of the whole of the present staff of 905 Europeans and 420 Africans, but Fig. 10 shows the small beginnings from which it grew.

Production Division

Shortly after its foundation the Institute commenced the production of antisera for the treatment of meningitis and other diseases. The original stable consisted of only 4 horses and, even when an increase was required, it was possible to accommodate them in an area at the back of the original building. This division of the Institute's work flourished under the able and energetic guidance of Dr. E. Grasset, who came to South Africa from the Pasteur Institute in Paris. Further stimulus to the development of the production division was provided by World War II when there was a threat that Africa and the Far East might be cut off from all overseas sources of antisera and vaccines. A decision was taken to transfer the whole division to new and modern accommodation on the farm Rietfontein (Fig. 11). Large stables were built, exercise yards laid out, laboratories equipped and facilities provided for upwards of 250 horses. With these facilities it was



Fig. 9. Capt. Francis Gray.

possible to meet all demands made upon the Institute during and since the war for diphtheria, gas gangrene, tetanus and other antisera; snake-bite antivenene; cholera, typhus, rickettsia, yellow-fever, and other vaccines; typhoid, diphtheria, pertussis, tetanus and other toxoids; and a large range of other biological products. In addition to its necessary stables of horses, the production division has undertaken the establishment of large animal colonies from

which all departments of the Institute draw their requirements of laboratory animals.

Research Division

The stimulus which led to the foundation of the Institute was the need for research into diseases which were of vital economic importance to the mining industry. Wisely, however, the sponsors made its terms of reference very wide and required only that its researches and investigations be carried out with a view to the prevention and treatment of human diseases. This stimulus has never been lost and has remained the central thread and reason for existence of the Institute. Throughout the 50 years since its foundation routine work has been a source of inspiration for much of the research work which has been embodied in over 1,500 publications. To detail this immense body of research would require a volume in itself. No more will be done on this occasion than to outline its development and the main lines which have been followed.

The annual grant for the support of research which was made by the original sponsors was generous in its day and, as routine and production activities increased, the

growing need for further research funds was readily met from the turnover of these divisions. Following World War II, however, pathological services in South Africa entered into a more sharply competitive world, and funds which were previously used for the furtherance of research were no longer adequate to meet the growing needs of the research division. In these circumstances and following the emergence of a more broadly based national research organization, the South African Council for Scientific and Industrial Research became, in 1947, the third sponsor of the Institute's research division. Each of the 3 sponsors undertook to provide an annual grant in support of research and, in each instance, the sum was 50% greater than that made available by the original sponsors in 1912. Even this greater support, however, fell short of the Institute's total research budget by more than 60% each year. It is a source of gratification that the mining industry, one of the original sponsors, recognized the acute situation and has recently doubled its annual research grant to the Institute.

Despite the steady stream of research which has always vitalized the Institute there have been comparatively few

full-time research workers. The greater part of the research has derived its material and inspiration from the day-to-day handling of routine responsibilities. For this reason its early research was concerned with pneumoconioses, with nutrition, and with infectious, protozoal and helminthic diseases. These were the medical problems which faced the mining industry in 1912 and the conditions for which routine investigations were required. Silicosis, typhoid fever, tuberculosis, pneumonia, meningitis and hookworm were rife on the mines, and the introduction of labour from tropical areas brought in the problems of malaria, yaws and filariasis. With such a wealth of clinical material on which to draw, the staff of the newly formed Institute found abundant research projects ready to hand. As the decades passed the research emphasis shifted. Old problems were solved and new ones became apparent. By the end of World War II the interest had shifted to rickettsial and virus diseases, to immunohaematology, to the cardiovascular degenerative diseases, to the auto-immune and allergy diseases, and to the question of demographic pathology with all its facets so brilliantly displayed in multiracial South Africa. What the future



Fig. 10. Staff of the South African Institute for Medical Research, 1917.

	J. de Bruyne	L. G. Whitaker	S. B. Lloyd	P. Hardwick		
A. Margolius	J. R. Cooke				T. S. Ingram	L. A. Paul
E. F. W. Course	L. Dickson	M. Morris	D. Dix	A. G. Lambert	W. W. Louttit	
Prof. H. B. Fantham	Dr. A. P. Fantham	Dr. W. Watkins-Pitchford	Dr. F. S. Lister	Dr. J. G. Becker	F. H. Joseph	
J. H. Cilliers	A. Zoutendyk	A. N. Henderson	P. Roux	J. G. Boss		



Fig. 11. Serum Farm, Rietfontein — opened in 1941.

holds only time will tell, but the newer techniques of electron microscopy, radio-isotopes, gas chromatography and electrophoresis are opening up vast vistas of new and fascinating research.

This expansion of its research activities led the Institute into close association with other related national and international organizations, with the result that many of the research projects are now jointly supported by several sponsors. Cooperation between the Institute, the WNLA and the mine medical officers has always been close and harmonious and has led to much of its finest research. In recent years, other associations of importance have arisen. The first such associated organization came into being as a result of the poliomyelitis epidemic which swept South Africa in 1948. Public funds were raised for the purpose of establishing a research organization devoted solely to this disease. The Poliomyelitis Research Foundation was built in the Institute grounds and, with staff seconded from the Institute, carried on in greater breadth and detail the research which had already, for some years, been in progress at the Institute. In the decade which has elapsed since its opening, the Poliomyelitis Research Foundation has successfully defined the poliomyelitis problem in South Africa and produced a vaccine which has brought the disease under control. The magnificent facilities of the Foundation are now turning to other virus diseases and, in so doing, are extending further benefits of virus research to the population of South Africa (Fig. 12).

Similar interest in the support of virus research has been displayed by other organizations. The South African Council for the Blind has supported the work on trachoma which resulted in the isolation of the virus and the preparation of a vaccine for which high hopes are held. This success in many aspects of virus work has attracted the attention of international organizations such as the World Health Organization, which has appointed the Institute as a reference centre for Africa in such conditions as influenza, respiratory viruses, poliomyelitis and other enterovirus infections. A serum reference bank, which is one of three in the world, has also been established at the Institute by WHO and is particularly concerned with the African region.

In other fields, too, the work of Institute scientists has gained recognition, as is shown by the grant of support

for cancer research by the National Cancer Association of South Africa; for bilharzia, blood dyscrasias, lipid metabolism, entomology and electrolyte metabolism by the South African Council for Scientific and Industrial Research; for human nutrition and cardiovascular degenerative diseases by the National Institutes of Health of the United States Public Health Service; for blood dyscrasias and radio-isotopes by the Atomic Energy Board of South Africa, the Nuffield Foundation, and the World Health Organization; and for the vastly extended work on the pneumoconioses by the mining industry and the Department of Mines, who have set up a Pneumoconiosis Research Unit under the aegis of the South African Council for Scientific and Industrial Research with staff seconded from the Institute.

By the very nature of the research problems with which they were faced, Institute workers have always been interested in the subject of epidemiology. This interest is well exemplified by the studies of plague. Plague was brought to South Africa by rats in the fodder consigned to South African ports during the Anglo-Boer war. As the lines of communication extended into the interior, the disease was transmitted to the indigenous veld rodents in which it became endemic. Studies of its epidemiology revealed the important part played by *R. natalensis*. This finding aroused further interest in the ecology of South African disease problems and, as a result, the Medical Ecology Unit of the Union Health Department was established in the Institute in 1946 to study the relationships between hosts, vectors and environment. It has, since that time, worked in the closest cooperation with the Departments of Entomology, Bacteriology and Virology.

Not only has the Institute expanded within the bounds of its own organization, but it has also contributed to the development of services which are no longer associated with it. The first blood transfusion service in Johannesburg was begun by the Institute. It subsequently became the Rand Blood Transfusion Service which the Institute helped to found and, eventually, the South African Blood Transfusion Service. The rise of immunohaematology in the postwar years, however, demanded that the Institute continue to some extent in this field, and this



Fig. 12. Poliomyelitis Research Foundation — opened in 1953.

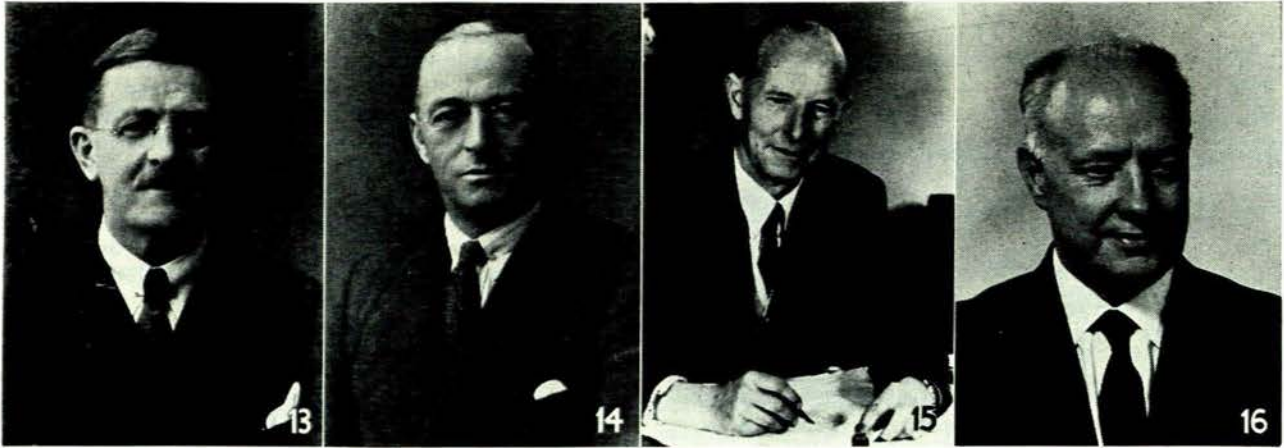


Fig. 13. Dr. W. Watkins-Pitchford, first Director of the Institute and Chairman of the Miners' Phthisis Medical Bureau, 1912 - 1926. Fig. 14. Sir Spencer Lister, Director 1926 - 1939. Fig. 15. Dr. E. H. Cluver, Director 1940 - 1959. Fig. 16. Dr. J. H. S. Gear, Director since 1960.

led to the development of a transfusion service which serves the 350,000 non-European labourers upon the mines.

PERSONALITIES

The growth and development of the Institute over the last 50 years inevitably calls to mind the names of those who have been associated with its establishment and growth. To mention a few names is invidious and to give credit to all to whom it is due is impossible in a short article. Reference will be made therefore only to the Directors of the Institute and to those who, having served it well, have now retired from Institute service.

The four Directors of the Institute have been Dr. W. Watkins-Pitchford (Fig. 13), Sir Spencer Lister (Fig. 14), Dr. E. H. Cluver (Fig. 15) and the present Director, Dr. J. H. S. Gear (Fig. 16). Each in his own way has moulded the character and work of the Institute and each has contributed to its research output. Throughout the 50 years of its existence there have been only 2 business managers to guide its destiny and fortunes — Mr. W. A. J. Cameron (Fig. 17) 1918 - 1945, and the present Manager, Mr. L. G. Whitaker (Fig. 18). During their tenure of office all these men have been ably supported by a galaxy of talented men and women such as



Fig. 17. W. A. J. Cameron, Manager 1918 - 1945.

Mavrogordato, Simson, and Strachan in pathology and, in particular, in the pneumoconioses; Ingram, de Meillon, and Porter in entomology, protozoology and helminthology; Harvey Pirie, J. G. Becker, and Paul Roux in microbiology; Fox in nutrition; Buchanan in haematology; Gray in clinical pathology; and des Lingeris in cancer. Turning over old documents of the Institute, it is interesting to see the prescience of many of these men,

who not only pursued the research with which they were engaged, but who could peer into the future and discern the way in which it was leading. Perhaps the most telling of such remarks is contained in a letter by des Lingeris in which, in 1941, he accurately forecast the important place of intracellular biochemical changes and the possible role of viruses in human cancer. 'The lines along which, in our present state of knowledge,' he wrote, 'experimental cancer research should be carried out, are of a definite biochemical character and... we must now investigate the chemical make-up of cancer-producing substances, more especially those produced within the organism, this quite independently of the question as to whether or not viruses are the real cause of cancer'.



Fig. 18. L. G. Whitaker, Manager since 1946.

No tale of the personalities of the Institute would be complete, however many internationally known figures it might contain, if reference were not made to the many loyal African workers who, through the decades, have washed the glassware, cared for the animals, dusted the laboratories and carried on the multifarious duties of those who serve and wait (Fig. 19). With the passage of



Fig. 19. Long-service African employees, from l. to r.: Ben Qoma, 25 years; Charlie Ndhlovu, 26 years; Enoch Mazabuku, 30 years; Dick Tabeti, 48 years; George Zulu, 14 years; Moses Khoza, 30 years; and Charlie Mhlaba, 28 years.

years this aspect of Institute life, too, is changing. Appropriately enough, the change first manifested itself at the hospital run by the Witwatersrand Native Labour Association, one of the original sponsors. At this hospital a few years ago the first Bantu laboratory technicians were trained. Using the same syllabus and sitting the same examinations as the Europeans they successfully completed the course and are now registered as medical technologists with the South African Medical and Dental Council. Slowly this development is extending, and it is expected that most, if not all, of the laboratories in the new hospitals

servicing the Bantu townships on the Reef will be staffed by Bantu medical technologists. We may, perhaps, even look forward to the day when they will progress from routine and make their contribution to the research activities of the Institute. One of them, after a highly successful career in medical technology, is now a fifth year medical student. It may not be too much to hope that some day, in the not too distant future, he will be the first Bantu pathologist to serve South Africa in research as well as in the diagnostic aspects of laboratory work.

CONCLUSION

In addition to the routine, research and production activities of the Institute, it has always served as a centre where professional and technical staff were trained. Many of these have taken up posts in other parts of South Africa and the world. Almost a third of the specialist pathologists in South Africa have spent part or the whole of their training period at the Institute. This training function continues and it is expected that the young pathologists and technicians now at the Institute will carry on the tradition of service to South Africa which was handed down by their predecessors.

Quietly and unspectacularly these research, routine, and production services continue, and South Africa is ably served by the medical scientists working at the Institute for Medical Research. Very often their work is more familiar to scientists throughout the world than it is to the population of South Africa, but the economic, social and humanitarian benefits which it bestows upon the people of South Africa and of this continent are widespread, cumulative, and enduring.