THE
BAKER MEDICAL RESEARCH
INSTITUTE

FOURTH
ANNUAL REPORT

1929-1930

PREFACE.

In presenting the Fourth Annual Report of the Baker Medical Research Institute, we cannot refrain from mentioning how we miss Mr. Baker at the Trustees' meetings. His earnest purpose and wise counsel were ever a stimulus in the work, and if we miss him, how much more does the work itself. In his presence questions of finance did not occasion such difficulties as they do now. His generous and ever-ready acceptance of further liabilities, expressing his hope, faith and devotion, smoothed the path of the Institute's development, while now we have to observe very closely that any new activity proposed will not unduly encroach upon our resources.

The work of the year is dealt with in this report, and reveals a versatility of interest on the part of the workers and most careful attention and devotion to the problems in which they have been engaged. Many of these problems are of first rate importance to medicine, and valuable progress has been made in many directions. We should like to express our thanks to the staff for its efforts and to make honourable mention of the voluntary workers' services.

We acknowledge our debt to Mr. E. H. Flack and Mr. E. O'Donnell for their services as honorary officers of the Trust, and desire to welcome, as Honorary Solicitor, Mr. J. Turnbull, who, we believe, will be a source of strength in promoting the development of the work.

(Signed) J. F. MACKEDDIE,

Chairman of the Trustees.

The Baker Medical Research Institute

ALFRED HOSPITAL, PRAHRAN, MELBOURNE

The Baker Institute and Pathological Department are under a unified administration.

TRUSTEES OF THE BAKER INSTITUTE.

DR. J. F. MACKEDDIE, Chairman, Hon. Physician to the Hospital.

R. H. WILKINS, ESQ., Member of the Board of Management of the Hospital.

J. SUTHERLAND, ESQ.

E. O'DONNELL, ESQ., Hon. Treasurer to the Baker Institute and the Hospital.

JOHN TURNBULL, ESQ. (Blake and Riggall), Honorary Solicitor.

E. H. FLACK, ESQ. (Flack and Flack), Hon. Auditor.

LIEUT.-COL. J. H. P. ELLER, D.S.O., V.D., Secretary to the Trustees.

STAFF OF THE BAKER INSTITUTE.

Medical Personnel:

(*a*) *Full-time Workers*—	*Duty.*
W. J. PENFOLD, M.B., C.M. (EDIN.), B.HY. (DUNELM), M.R.C.S. (ENG.).	Director of the Institute and Hon. Bacteriologist to the Hospital.
A. B. CORKILL, M.B., B.S. (MELB.)	Research Biochemist. (Seconded for research work with Dr. Dale, Medical Research Council Laboratories, Hampstead, England.)
J. A. MCLEAN, M.D., B.S. (MELB.)	Biochemist of the Hospital.
(*b*) *Part-time Workers*—	
J. F. MACKEDDIE,* B.A., M.D., B.S. (MELB.)	Neurological Research.
JOHN FIDDES,* M.D. (ABERDEEN)	Experimental Physiologist.
H. LAWRENCE STOKES,* M.B., B.S (MELB.), M.R.C.P (LONDON)	Reporter, Electrocardiographic Department.
CHAS. E. SUTHERLAND, M.B., B.S. (MELB.), M.R.C.P. (LONDON)	Investigation of methods for the detection and removal of the allergic state.
ALFRED J. TRINCA,* M.D., B.S., (MELB.), F.R.C.S. (ENG.), F.C.S.A.	Hon. Consulting Pathologist to the Institute.
HUGH C. TRUMBLE,* M.C., M.B., B.S. (MELB.), F.R.C.S. (ENG.) F.C.S.A.	The Investigation of the Nerve Supply and Musculature of Certain Abdominal Viscera.
J. RINGLAND ANDERSON,* M.C., M.B., B.S. (MELB.), F.R.C.S. (EDIN.), F.C.S.A., D.O.M.S. (LONDON)	Various Ophthalmological Investigations.
ROBT. FOWLER,* O.B.E., V.D., M.D., B.S. (MELB.), F.R.C.S. (ENG.), F.A.C.S., F.C.S.A.	Investigation of Gynaecological Problems.
G. A. KAYE,* M.D., B.S. (MELB.)	Analysis of Alfred Hospital Cases of Nephritis.
KEITH HALLAM,* B.A.; M.B., B.S. (MELB.)	Study of Chloride Content of Body Fluids.

Medical Personnel: Part-time (Continued)—

EWEN DOWNIE, M.D., B.S. (MELB.), M.R.C.P. (LONDON)	The Study of Insulin Resistance in Infections.
SURGEON LIEUT. L. LOCKWOOD, M.D., B.S. (MELB.), R.A.N.	Study of Wassermann reaction, etc.

Scientific Personnel and Assistants:

(*a*) *Full-time Workers*—

MR. JAS. SUTHERLAND . . .	Bacteriologist.
MR. A. F. DOUTCH	Physical Chemist.
MARGARET E. LONG, M.SC. (MELB.)	Biochemist.
S. E. ALLASON, B.SC. (MELB.) (Resigned)	Electrocardiographist and Biochemical Assistant.
DOROTHY H. IRVING, B.SC. (MELB.)	Biochemist.
MR. GILBERT PARKER . . .	Comparative Bacteriologist.
HILDRED M. BUTLER, B.SC. (MELB.)	Bacteriologist.
MR. CHAS. A. E. PRICE* . . .	The Concentration of Serum and the Determination of the Refractive Index of the Body Fluids.
MR. E. M. BURT	Histological Technician.
MISS N. SUTHERLAND (Resigned)	Assistant.
IRWIN J. FERRIS (Resigned)	Assistant.
JAS. E. PAYNE	Assistant.
MR. W. P. T. SORRELL . . .	Assistant.

(*b*) *Part-time Workers*—

ISOBEL M. MCPHEE, B.SC. (MELB.)	Biochemical Assistant.

(One half of Miss McPhee's time is spent in hospital service as Assistant in the Asthma Clinic.)

Secretarial:

Miss Edith Ross	Secretary to the Director.

Animal Attendants:

Alex. Gray	
Len. Smith	Assistant.
M. Luke	Assistant.

PATHOLOGICAL DEPARTMENT.

Medical Personnel:

(*a*) *Full-time Workers—*

John Fiddes, M.D. (Aberdeen)	Pathologist to the Hospital.
H. A. Phillips, M.D., B.S. (Melb.)	Assistant Pathologist and Assistant Curator of Museum.

(*b*) *Part-time Workers—*

Professor P. McCallum,* M.C., M.B., Ch.B.	Hon. Pathologist to the Hospital.
Alfred J. Trinca,* M.D., B.S. (Melb.), F.R.C.S. (Eng.), F.C.S.A.	Hon. Curator of the Pathological Museum.

Scientific Personnel and Assistants:

Mr. A. Hyams	Pathological Technician.
Mr. A. H. Ennor.	Assistant.
Mr. Reginald Prosser . . .	P.M. and Histological Assistant.
Mr. Glen Buckle	Assistant.

*Denotes Honorary Workers.

Fourth Annual Report

OF

The Baker Medical Research Institute

April 30th, 1930.

Gentlemen,—

Once again, and all too quickly, April 30th, the end of the Institute's scientific year, has passed, and calls for a review of the vicissitudes of the Institute, its work and progress.

An extremely gratifying feature of the past year has been an increasing orientation on the part of the clinical staff of the Hospital towards the Institute as a place where its members may come and personally solve some of their problems. During the year we have had eleven members of the clinical staff of the Hospital working with us. Their growing regard for the opportunities the Institute offers is a guarantee of its success. The personal co-operation of the Medical Superintendent and the Resident Medical Officers of the Hospital, with the various individual workers of our Institute, has become substantially closer and more effective during the past year, so that very few cases fail to receive the help which an effective laboratory should provide.

During the year Dr. Fiddes joined the staff of the Baker Institute in the capacity of Honorary Experimental Physiologist. His success in co-operating amiably with younger workers in this field marked him out as likely to forward substantially the objects for which the Institute was created.

Dr. Corkill has been in Europe working for the major portion of his time, with Dr. Dale, of the Hampstead Institute. Dr. Dale has greatly appreciated Dr. Corkill's collaboration.

Mr. Trumble, in collaboration with Dr. Fiddes, started, in August, 1929, the investigation of the innervation and musculature of certain of the hollow abdominal viscera, since when he has devoted a certain definite amount of time weekly to the pursuit of this work.

In the beginning of April, 1930, Dr. Major arranged to work two mornings weekly at the Institute with Dr. McLean, investigating by the most modern methods blood changes in disease.

In November, 1929, Dr. Kaye left for study in England after an arrangement had been entered into with Professor Hugh MacLean to receive him as one of his research workers. Before his departure Dr. Kaye was engaged in an analysis of the cases of nephritis that had been treated in the Hospital for many years past, and it is hoped that he will resume this work on his return.

Dr. Hallam's work had, unfortunately, to be interrupted because of the departure of Dr. Morris, his partner, on a tour abroad. It is now definitely settled that he will be able to recommence his work at an early date.

In June, 1929, Miss Long was appointed a bio-chemist of the Institute, her laboratory experience in Australia and Europe being a distinct asset.

In December, 1929, Miss Allason resigned after eighteen months of extremely devoted bio-chemical service, and in January, 1930, Miss McPhee was appointed in her place.

On 30th March, 1930, Dr. Lockwood left the Institute after doing a year's post-graduate work with us. He was seconded from the Navy for the purpose, and was specially engaged in the study of the serology of venereal disease. He was a helpful and valued colleague.

Shortly after Mr. Cash started his work on the study of dental caries and pyorrhoea, he had to interrupt it to go to America on study leave.

In March, 1930, Mr. Irwin Ferris, who had been assistant to Mr. Sutherland, was awarded a four years' scholarship at the University, which caused him to relinquish his position and join the Faculty of Engineering there.

During the year Miss Nancy Sutherland spent six months at the Institute, and rendered considerable practical help in the use of certain bacteriological methods.

Mr. Trulsson was seconded from the Navy for an educational course at the Baker Institute, it being the desire of Surgeon Captain Darby that he should become thoroughly acquainted with the technique employed in the pathological and bacteriological departments. Mr. Trulsson has now acquired a serviceable knowledge of technical matters which will be of substantial value to the Navy in the development of its laboratory service.

Mr. Gray, the animal attendant, has been provided with a second junior assistant.

ROUTINE WORK.

During the year four fully equipped pathological tables were provided by the Hospital, so that the Resident Medical Officers and Students might have opportunities for doing much of their laboratory work at the bedside. This was deemed desirable by the Medical Staff for two reasons—it would have a very definite educational value for the Residents and Students, and it would also tend to diminish the amount of routine work falling upon the personnel of the laboratories. This latter effect has not in actual fact been realised, for the examinations required of the laboratories have increased by nearly 2000 during the year, an increase of 13.2 per cent.

The following table gives an account of the routine work, and shows that it has grown in every section; it seems likely that this growth may be expected to continue.

ROUTINE WORK FOR YEAR ENDED 30th APRIL, 1930.

Pathological Department:

Post-Mortem Examinations	282	
Examinations of Sputum for T.B.	898	
Micro. Examinations of Urine	1,637	
Micro. Examinations of Pleural and Peritoneal Fluids	155	
Blood Examinations	316	
Pus Examinations	58	
Micro. Sections—Post Mortem	396	
„ „ —Paraffin	1,215	
„ „ —Frozen	644	
Guinea Pig Inoculations	94	
	——	5,695

Biochemical Department:

Test Meals	423
Blood Ureas	751
Urea Concentration Tests	576
Blood Sugar Estimations	1,119
Cerebro-spinal Fluid Examinations	211
Basal Metabolic Rate Estimations	80
Fouchet Tests	45
Van den Bergh Tests	43
Occult Blood Tests	123
Laevulose Efficiency Tests	5
Diastase Tests	54
Blood Calcium Tests	13

Biochemical Department (Continued):		
Lange Reactions	4	
Urine Tests for Sugar, etc.	29	
Fragility Tests	19	
Miscellaneous	18	
		3,513
Electrocardiograms		493
Bacteriological Department:		
Wassermann Tests	2,336	
Gonococcal Complement Fixation Tests	38	
Diphtheria Examinations	1,079	
Examinations for Gonococci, etc.	1,392	
Dark-ground Examinations	18	
Blood Cultures	124	
Sundry Cultures	431	
Vaccines	102	
Investigations for Typhoid and Dysentery	136	
Widal Tests	47	
Other Agglutination Tests	43	
Pneumococcal Typing	130	
Sundry Smears	121	
Hydatid Complement Fixation Tests	12	
Inoculations	414	
Miscellaneous	14	
		6,437
Total		16,138

RESEARCH WORK.

The work published during the year or in course of preparation for publication is as follows:—

(The papers are arranged in the alphabetical order of the authors.)

J. Ringland Anderson, M.C., M.B., B.S. (Melb); F.R.C.S. (Edin.); F.C.S.A., D.O.M.S. (London):

"Contact Lenses in Conical Cornea," appeared in "The Medical Journal of Australia," 15th February, 1930, page 216.

"The Pathology and Treatment of Detachment of the Retina."

In Preparation:

"The Aetiology and Treatment of Conical Cornea," in preparation.

A. B. CORKILL, M.B., B.S. (Melb.), and A. DOUTCH:

"An Investigation into the Alleged Therapeutic Properties of Vinca Rosea in the Treatment of Diabetes," appeared in "The Medical Journal of Australia," 15th February, 1930, page 213.

EWEN DOWNIE, M.D., B.S. (Melb.); M.R.C.P. (London):

"The Problem of Diabetic Mortality," appeared in the "State Health Bulletin," September, 1929.

"Toxaemia and Glucose Tolerance," presented at a meeting of the British Medical Association, 5th March, 1930. In the press.

"The Results of Treatment of Diabetes Mellitus," presented at a meeting of the Alfred Hospital Clinical Society, July, 1929.

"The Morbid Histology of the Arteries in Diabetic Gangrene." In preparation.

JOHN FIDDES, M.D.; H. LAWRENCE STOKES, M.B., B.S. (Melb); M.R.C.P. (London); and MISS S. E. ALLASON, B.Sc. (Melb.):

"The Action of Electrolytes on the Heart," presented at a meeting of the British Medical Association, 5th March, 1930. In the press.

JOHN FIDDES, M.D., and H. A. PHILLIPS, M.D., B.S. (Melb.):

"A Case of Lympho-Sarcoma and its Relation to Trauma." In the press.

JOHN FIDDES, M.D.:

"Pathological Aspects of Thyroid Disease." In preparation.

GEOFFREY KAYE, M.D., B.S. (Melb.):

"Pathological Findings in Deaths During Anaesthesia," presented at the Australasian Medical Congress, September, 1929. Appeared in "The Medical Journal of Australia," 18th January, 1930, page 66.

J. F. MACKEDDIE, M.D.:

"Encephalography, Including the Use of 'Lipiodol' in Central Nervous System Diagnosis," appeared in the "Transactions of the Australasian Medical Congress," 2nd-7th September, 1929, page 80.

"Diagnosis and Treatment of Chronic Lung Conditions as Complications or Sequelae of Upper Air Passage Disorder," appeared in the "Transactions of the Australasian Medical Congress," 2nd-7th September, 1929, page 67.

JOHN A. MCLEAN, M.D., B.S. (Melb.):

"Supravital Staining of the Large Mononuclear Cells in Infectious Mononucleosis and the Acute Leuchaemias, with Particular Reference to the Origin in the Former Disease," appeared in the "Medical Journal of Australia," 23rd November, 1929, page 734.

"The Changes in the Blood and Haematopoietic Tissue in Experimental Lead Poisoning." In the press. Presented and accepted as a thesis for the Degree of M.D. of the University of Melbourne.

W. J. PENFOLD, M.B., C.M. (Ed.); B.HY. (Dunedin); M.R.C.S. (Eng.); and C. A. E. PRICE:

"Refractive Index of the Cerebro-spinal Fluid," appeared in the "Medical Journal of Australia," 28th September, 1929, page 424.

W. J. PENFOLD, M.B., C.M., B.HY., M.R.C.S.; and DOROTHY H. IRVING, B.SC.:

"The Refractive Index of the Cerebro-spinal Fluid, used as a Check on the Chemical Analysis," presented at the meeting of the British Medical Association, 5th March, 1930. In the press.

W. J. PENFOLD, M.B., C.M., B.HY., M.R.C.S.; and HILDRED M. BUTLER, B.SC.:

"Undulant Fever in Australia." In the press.

W. J. PENFOLD, M.B., C.M., B.HY., M.R.C.S.; and JAS. SUTHERLAND:

"The Effect of Light on Blair Bell's Colloidal Lead." In the press.

W. J. PENFOLD, M.B., C.M., B.HY., M.R.C.S.; JAS. SUTHERLAND; HILDRED BUTLER, B.SC.; and A. HYAMS:

"Experimental Infections with Haemolytic Streptococci and Their Control by Serum." In preparation.

H. A. PHILLIPS, M.D., B.S. (Melb.):

"Mesenteric Cysts." In preparation.

H. LAWRENCE STOKES, M.B., B.S. (Melb.); M.R.C.P. (London):

"Electrocardiography as Applied to Infants and Children," appeared in the "Transactions of the Australasian Medical Congress, 2nd-7th September, 1929, page 426.

CHAS. E. SUTHERLAND, M.B., B.S. (Melb.); M.R.C.P. (London)

"Hypersensitiveness to Linseed," appeared in "The Medical Journal of Australia," 18th May, 1929, page 665.

"The Problem of Asthma and Other Allergic Diseases in Childhood," appeared in the "Transactions of the Australasian Medical Congress," 2nd-7th September, 1929, page 419.

"The Clinical Use of Ephedrine." In preparation.

"Histamine Tolerance." In preparation.

"Specific Desensitisation in Asthma and Hay Fever." In preparation.

CHAS E. SUTHERLAND, M.B., B.S., M.R.C.P.; and JOHN FIDDES, M.D.:

"The Use of Ephedrine in Experimental Bronchial Spasm in Animals." In preparation.

T. A'B. TRAVERS, M.B., B.S., M.R.C.P.; and E. M. BURT:

"Post-anaesthetic Acidosis," appeared in the "Medical Journal of Australia," 16th November, 1929, page 709.

A. J. TRINCA, M.D., B.S. (Melb.); F.R.C.S. (Eng); F.C.S.A.:

"Fat Necrosis of the Female Breast," appeared in the "Journal of the College of Surgeons of Australasia," Vol. II., No. 1, July, 1929, page 21.

"The Effects of Incomplete Surgery in Carcinoma of the Breast." In preparation.

HUGH C. TRUMBLE, M.C.; M.B., B.S. (Melb.); F.R.C.S. (Eng.); F.C.S.A.:

"The Innervation and Musculature of the Hollow Abdominal Viscera." In preparation.

The work of the Institute is published in extenso in various medical and scientific journals, but a short statement of some of the salient features of recent research may be of interest.

Dr. McLean has submitted a thesis to the University of Melbourne on the results of his study of the effect of lead on the blood and blood-forming organs. The thesis was accepted for the Degree of M.D., and awarded the Armytage Prize for Medical Research. The result is gratifying, as the prize last

year was also won by a Baker Institute worker, Dr. Kaye. The chief findings of Dr. McLean were as follows:—

(a) A great destruction of red blood corpuscles followed the administration of lead. This was not accompanied by a diminution in the plasma volume which remained, in fact, constant.

(b) Young red cells were extremely susceptible to lead.

(c) The amount of anaemia, as indicated by counting the red blood corpuscles, did not give an adequate idea of the profound character of the anaemia.

(d) After the exhibition of lead the blood platelets increased.

(e) These changes in the formed elements of the blood were found to be correlated with changes in the bone marrow.

Dr. McLean was also able to show that susceptibility to lead is correlated with a diminution in the amount of lymphoid tissue in the spleen and lymph glands.

Dr. Mackeddie has studied the technique of encephalography and compared various methods used to give complete pictures of the intracranial structures. The value and limitations of the procedure in the light of Alfred Hospital clinical material have been examined. He has continued his study of the use of lipiodol in the diagnosis of spinal block, and has shown how the interpretation of results is a matter of great complexity, and how, not infrequently, it alone is able to supply information as to the exact localisation of the tumour causing the block. He also communicated to the Medical Congress in Sydney (1929) a paper dealing with chronic lung conditions complicating disorders of the upper air passages. In this paper he illustrated the value of lipiodol as a contrast medium for X-ray examination of the lungs. He discusses the value of the bronchoscope, artificial pneumothorax and phrenic avulsion in the treatment of these cases and the possibility of the prevention of the graver conditions by the proper investigation and management of the early cases.

Drs. Fiddes and Stokes and Miss Allason studied the action of electrolytes on the heart. Their paper, now in the press, gives a general survey of the action of the ions of the blood on the heart of the lower vertebrate, and new research on their action on the mammalian heart. Interesting effects are shown in the electrical response. Among other things, stress is laid upon the block action of the H ion in excess, and the possibility of localised acidity being a factor in disorder of the human heart characterised by faulty conduction and varying degrees

of block. An interesting point is the quickening and increase in the electrical response when sodium is reduced to one half the concentration of that present in Ringer's fluid.

Drs. Fiddes and Phillips have carefully described the pathological findings in a case of lympho-sarcoma which had been attributed to injury. The possible traumatic origin of such tumours, which is of great importance, is discussed in the paper.

Mr. Trumble and Dr. Fiddes are investigating the innervation and musculature of some of the hollow viscera of the abdomen. They have developed an excellent technique, but are not yet in a position to make any statement of results.

Miss Irving and the writer continued the work of the Institute on the refractive index of the cerebro-spinal fluid, and especially its use in checking the chemical analysis. The communication dealing with this is at present in the press. The work goes to show that an index can be calculated from the chemical findings which, in over half the cases, corresponds very closely with the observed index, but in a fairly large number of cases marked discrepancies between the two indices have been found to occur. This is especially the case in uraemic and nephritic cases, where the observed index is commonly higher than the calculated, showing that there are constituents in the cerebro-spinal fluid in abnormal amounts which are not taken into account in the chemical analyses as usually performed. About one hundred fluids have been examined chemically and checked up by the index, and in the paper mentioned the results are recorded.

Miss Butler and the writer have described the first two cases of undulant fever occurring in Australia in recent times, the paper dealing with the subject being at present in the press.

Mr. Sutherland and the writer have described the effect of light on Blair Bell's colloidal lead used in the treatment of cancer. This has been demonstrated to several scientific meetings, and a written account of it is now in the press. The paper shows that the lead colloid moves towards the light, and that light of short wave length is active in the reaction.

Mr. Sutherland has made a high grade diphtheria toxin, with which he has immunised a horse, producing a fairly potent diphtheria antitoxin. This antitoxin is a necessary adjunct to the work of serum concentration, for supplies of diphtheria antitoxin without antiseptic have not been available recently on the local market.

The streptococcal work which Miss Butler, Mr. Hyams and the writer carried out during the previous year has been con-

tinued this year by Mr. Sutherland. The examination of all the haemolytic streptococcal strains isolated by blood culture has been continued, and the work will very shortly be published. Mr. Sutherland has also made a valuable resume of the literature on the haemolytic streptococci.

Dr. J. R. Anderson has worked on the subject of the use of contact lenses in conical cornea. When the centre of the cornea is conical rather than spherical, it is easy to understand that ordinary lenses will not restore good vision. By the use of a lens which is actually touching the cornea, and similar in shape on its posterior surface to the corneal surface with which it is in contact, and when such lens has a suitable correction ground on its anterior surface, it is possible to restore vision so that it becomes normally acute. This work was commenced in Europe, and has been successfully continued by Dr. Anderson in Australia. It represents a great advance in treatment. Unfortunately, the lenses cannot be made in Australia at present, and have to be ordered from Europe. Dr. Anderson has also been working on the subject of detachment of the retina—its causation and treatment—and has a paper in preparation.

Dr. Sutherland has shown that hypersensitiveness to linseed is common amongst allergic patients tested in Melbourne. He also communicated to the Australasian Medical Congress in Sydney a paper dealing with certain aspects of asthma and allergic diseases in childhood. The large material that Dr. Sutherland passes in review in his Asthma Clinic at the Alfred Hospital, and elsewhere, gives him wonderful opportunities for making new observations on hypersensitiveness in the human subject in Australia, and his results have been extremely helpful to the profession. He has, in addition, several papers in preparation, dealing with (1) the clinical use of ephedrine; (2) the use of ephedrine in experimental bronchial spasm in animals; and (3) histamine tolerance.

Dr. Downie has investigated the loss of glucose tolerance in animals intoxicated with diphtheria toxin. He has confirmed the occurrence of a marked loss of tolerance in this condition, but he concludes from his work that it is not due, as formerly supposed, to thyroid adrenal stimulation. He is not yet prepared to state its exact cause.

He has also in preparation a paper on the morbid histology of the arteries in diabetic gangrene. This work is of great interest, as the mortality of diabetes is now moving from the younger age groups to the older, and gangrene is an important factor in this mortality.

In addition, Dr. Downie has given valuable assistance in the Anti-diabetic Campaign, which will be dealt with later on in

this report. He has published articles analysing the mortality from diabetes in the Alfred Hospital, the State of Victoria and the Commonwealth of Australia, and a consideration of his analyses of these mortalities soon convinces one of the need of the Anti-Diabetic Campaign commenced from the Institute.

Dr. Stokes has rendered valuable service in the electrocardiographic work of the Institute, and has been almost entirely responsible for our official reports. At the Australasian Medical Congress in Sydney, 1929, he presented his results on electrocardiography as applied to infants and children. He showed the value of this work in diagnosis, and the probability of its becoming extremely valuable in prognosis as well.

In addition to the paper on "Fat Necrosis of the Female Breast," dealt with in our last Annual Report, Mr. Trinca has been working on the effects of incomplete surgery in carcinoma of the breast, and has in preparation a valuable paper on the subject.

Mr. Fowler, Hon. Gynaecologist to the Hospital, used the facilities of the laboratory to investigate certain effects of the use of the electric scalpel (high frequency electro-section and electro-coagulation). The work was carried out in collaboration with Drs. Fiddes and Stokes. When naked muscle is touched with the electro-sector, jerking occurs. It seemed possible that under these conditions dangerous bio-physical reactions might result. Electrocardiograms taken during the use of the electro-sector failed to show any harmful effect accompanying a high frequency muscle jerk, nor indeed, from faradism by a commercial 50-cycle current.

Dr. Phillips has now in the press a paper on mesenteric cysts, in which he gives an account of a complete pathological investigation of one such cyst and a discussion of the nature of these cysts in general, together with a survey of the literature.

Mr. Price, during the past year, in addition to determining the refractive indices of the cerebro-spinal fluids, has examined the refractive index of the bile, and has studied its chemical composition in various conditions. He has also investigated material from cases of suspected poisoning, and done a certain amount of food analysis for the Hospital. As our only full time honorary research worker, we deeply appreciate Mr. Price, and are grateful for his enduring enthusiasm.

Mr. Doutch has been investigating the keeping qualities of the Lange gold sol. He has also taken the dispersion of various body fluids, but unfortunately this study on dispersion has not revealed anything of great interest. He has developed the

photographic work of the Institute; this has been of great assistance to all the other workers in the presentation of their papers.

Mr. Parker has continued his research on Black Disease. He has produced an anatoxin which can undoubtedly immunise, but we are still in doubt as to whether its immunising power is sufficient to warrant extensive field use. It has been shown to be very effective in guinea pigs, and to some extent in sheep, but more laboratory experiments are needed to put its value on an exact quantitative basis. This work has been very largely financed by Mr. H. S. Rudduck, whose public-spirited endeavour on behalf of the stock-owners of Australia is beyond all praise.

RELATIONSHIP WITH OUTSIDE BODIES.

We would like to acknowledge primarily our debt to the Medical Research Council in England, and to Dr. Dale in particular, for the opportunities afforded to Dr. Corkill for experience in research. We realise the unique character of these opportunities, and trust that Dr. Corkill's one and a half years' collaboration with Dr. Dale will be of permanent value to the Baker Institute.

We have continued to draw upon the resources of the University Physical, Biochemical, Pathological and Library Departments as heretofore. We would like especially to thank Mr. Rogers for valuable help in dealing with certain physical properties of colloidal lead. He has always been happy to further the work of the Institute as far as it was possible. Professor Young, of the Biochemical Department, has been helpful in lending apparatus and advising us in respect of certain of our problems, and in putting us into touch with highly trained labour to help in the work of the Institute. Prof. MacCallum has frequently and freely advised us on research and routine matters.

No fewer than six of our scientific workers are members of the University Biological Sciences Research Club. This Club meets about once a month, either in one of the University departments or in the Walter and Eliza Hall or Baker Institute, when a little account of the work of the respective departments is given. The meetings are extremely refreshing, and a great privilege to those interested in the furtherance of biological science generally.

Towards the end of each scientific year we have had a meeting of the Victorian branch of the British Medical Association at the Hospital to deal exclusively with Baker Institute work. The

most recent meeting was on 5th March, 1930, when the following programme was presented:—

(1) Changes in the Blood and Blood-forming Organs in Lead Poisoning—Dr. J. A. McLean.

(2) The Action of Electrolytes on the Heart Beat—Drs. Fiddes and Stokes and Miss Allason.

(3) Toxaemia and Insulin Resistance—Dr. Ewen Downie.

(4) Further Studies in the Clinical Biochemistry of the Cerebro-spinal Fluid—Dr. Penfold and Miss Irving.

The Institute was represented at the Medical Congress in Sydney, August, 1929, and at the Cancer Conference in Canberra, on 20th and 21st March, 1930. The latter Conference is to be held annually; it is proposed that it should have an oversight over all the work done in the way of cancer research and treatment throughout Australia.

We have provided study facilities for certain members of the Australian Navy during the year, and our co-operation with them has been entirely agreeable and helpful.

Post-graduate demonstrations have been given under the auspices of the Post-Graduate Committee of the Victorian Branch of the British Medical Association and the Alfred Hospital Old Residents' Association.

The Anti-Diabetic Scheme, launched from the Institute at the instigation of the late Mr. Baker, has brought us into close co-operation with the State Health Department and the British Medical Association, and we hope that it may ultimately result in a reduction of the diabetic mortality in the State of Victoria.

We must once again acknowledge the generosity of the Felton Bequest Committee, which made available the sum of £100 to enable Dr. Ewen Downie to investigate insulin resistance and the diminution of glucose tolerance which occur in infections.

The State Cancer Research Fund, which it was hoped would be instituted under a bill proposed by Sir Stanley Argyle, has not yet been realised, and in the State of Victoria there are practically no endowments available for cancer research work.

EDUCATIONAL.

The Honours results of the Pathological and Bacteriological Examinations last year showed that the Alfred Hospital students did not do so well as the Fourth Year students of the previous year. They were given, in actual fact, more lectures and practical demonstrations in the laboratories, but the

response, as indicated by the examination results, was a little disappointing.

At the recent examinations 33 candidates presented themselves for the M.D. degree, only ten of whom were successful, and it is gratifying to think that five of these men received their opportunities for post-graduate instruction in the Alfred Hospital and the Baker Institute, three actually holding office in our laboratories, namely, Dr. McLean, Dr. Phillips, and Dr. Lockwood. Much of the success of these candidates may be attributed to the splendid facilities provided by the Hospital and to the help given to them gratuitously by their seniors.

Under the Anti-diabetic Scheme, Dr. Ewen Downie has given lectures on the present position of Diabetes Mellitus, in which he has dealt with the essentials of diagnosis and treatment at present necessary and available. These lectures have been given before the following sub-divisions of the British Medical Association, and have aroused a great deal of interest in the subject:—

Country:

South-Western District (Camperdown).
Bendigo.
Goulburn (Mooroopna).

Suburban:

Western (Williamstown).
Eastern (Hawthorn).

Two brochures dealing with diabetes have been supplied to every practising medical man in the State of Victoria—one for himself, and another specially written for patients. When the medical man notifies a case of diabetes he is automatically supplied with another patient's brochure. We hope in this way to get an idea of the extent of the problem in the State, to secure the hearty co-operation of the medical profession, and to put into the hands of every patient a simple, sound account of the disease from which he is suffering, and the steps that he must take to avoid any unnecessary risks. We hope that in the course of two or three years this scheme for arousing the interest of the medical man and educating the patient will have a very definite influence on the diabetic mortality. The two brochures are of composite authorship. They were drafted originally by Drs. Corkill and Travers, submitted to the authorities of the various hospitals for amendment, and received their final editorial corrections principally at the hands of Dr. Downie and the writer. The help of Dr. J. F. Wilkinson is very gratefully acknowledged. They have been very well received by the medical profession, and have been adopted by various public

hospitals for the instruction of their students and patients. They will also form one of the text books of the senior class in Dietetics at the Emily McPherson College. It will be the duty of the Institute to keep them up to date when further editions are required.

The inaccessibility of the foreign literature dealing with the problems which occupied the Institute caused a scheme to be instituted for the promotion of the linguistic education of members of the staff. The scheme was so arranged that it was hoped that in the course of two or three years French, German, Spanish, and Italian would each be thoroughly familiar to several members of the staff. The cultivation of this international outlook is absolutely indispensable in any scientific institute.

FINANCE.

The expenditure of the Institute during the year for research and routine work taken together has been £8242/18/8, while the revenue has only been £7289/9/6. Fortunately, we had a balance in hand at the commencement of the year from which the difference was met. The diminution of the balance, however, causes serious misgiving. The disquietude occasioned by this situation will be removed when the Hospital is in a position to pay its contribution of £1500 for the routine biochemical and bacteriological services. With the lifting of the depression, it is hoped that the position will be automatically rectified.

During the year Mr. Rouse, the Managing Director of Kodak (Australasia) Pty. Ltd., and the chief Trustee of Mr. Baker's estate, visited the laboratory, and was greatly interested in the work that Mr. Baker had developed. He assured us that the Trustees would make the Institute their first care, a fitting and abiding memorial to Mr. Baker.

(Signed) WILLIAM JAS. PENFOLD,

Director.

To the Trustees of the Baker Institute,
Alfred Hospital,
Prahran.