THE BAKER MEDICAL RESEARCH INSTITUTE

ELEVENTH ANNUAL REPORT

1936-37

PREFACE.

The resumption of work on 1st May, 1936, by the Director has been followed by a full year of active work on his part.

The present juncture is one which is full of meaning for the future of the Institute. The Commonwealth Health Department has had created a Department of Medical Research, the State has appointed an Anti-Cancer Council to conduct research work in this subject, and, in addition, maternal mortality and infant mortality have necessitated work in various branches which it is hoped will bear fruit.

J. F. MACKEDDIE,
Chairman of the Trustees.

The Baker Institute is dependent for its support on the Thomas Baker (Kodak), Alice Baker and Eleanor Shaw Benefactions.

The Thomas Baker, Alice Baker, and Eleanor Shaw Medical Research Institute.

ALFRED HOSPITAL, PRAHRAN, MELBOURNE.

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

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STAFF OF THE BAKER INSTITUTE.

Medical Personnel:

(*a*) *Full-time Workers*—	*Duty.*
W. J. PENFOLD, M.B., CH.M. (EDIN.), D.P.H., B.HYG. (DUNELM), M.R.C.S. (ENG.), L.R.C.P. (LONDON).	Director of the Institute and Hon. Bacteriologist to the Hospital.
A. B. CORKILL, M.B., B.S. D.SC. (MELB.)	Physiological Research.
(*b*) *Part-time Workers*—	
J. F. MACKEDDIE,* B.A., M.D., B.S. (MELB.)	Neurological Research.
R. A. WILLIS,* M.D., B.S., D.SC. (MELB.), M.R.C.P. (LONDON).	Pathological Research with special reference to malignant tumours.
H. LAWRENCE STOKES,* M.B., B.S. (MELB.), M.R.C.P. (LONDON)	Clinical Electrocardiographer.
CHAS. E. SUTHERLAND,* M.B., B.S. (MELB.), M.R.C.P. (LONDON)	Investigation of Allergic Problems.
ALFRED J. TRINCA,* M.D., B.S. (MELB.), F.R.C.S. (ENG.), F.R.A.C.S.	Hon. Consulting Pathologist to the Institute.
HUGH C. TRUMBLE,* M.C., M.B., B.S. (MELB.), F.R.C.S. (ENG.), F.R.A.C.S.	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.R.A.C.S. D.O.M.S. (LONDON).	Various Ophthalmological Investigations.
ROBERT FOWLER,* O.B.E., V.D., M.D., B.S. (MELB.), F.R.C.S. (ENG.), F.R.A.C.S.	Endocrine and Cancer Research.
LEONARD B. COX,* M.D., B.S. (MELB.), M.R.C.P. (EDIN.)	Study of the Histopathology of the Nervous System.

Medical Personnel: Part-time (Continued)—

EWEN DOWNIE,* M.D., B.S. (MELB.), M.R.C.P. (LONDON)	Investigations on Carbohydrate Metabolism.
G. A. KAYE,* M.D., B.S. (MELB.)	Anaesthetic Research.
J. A. MCLEAN,* M.D., B.S. (MELB.), M.R.C.P. (LONDON)	Haematologist.
J. M. BUCHANAN,* M.B., B.S. (MELB.), L.R.C.P. (LONDON), F.R.C.S. (ENG.), F.R.A.C.S.	Investigation of Endocrine Problems.
ADELAIDE GAULT,* M.B., B.S. (MELB.), D.G.M. (CALCUTTA), D.O.M.S. (LONDON).	Curator of the Ophthalmological Section of the Museum.
A. RUSSELL BUCHANAN,* M.D., B.S. (MELB.), M.R.C.P. (LONDON).	Study of the Cerebro-spinal Fluid.
H. BOYD PENFOLD,* M.B., B.S. (MELB.)	Helminthologist.

Scientific Personnel and Assistants:

(*a*) *Full-time Workers—*

MR. JAS. SUTHERLAND . . .	Bacteriologist.
MR. A. F. DOUTCH	Physical Chemist
HILDRED M. BUTLER, B.SC. (MELB.)	Bacteriologist.
MARY PHILLIPS, B.SC. (MELB.)	Biochemist.
MARJORIE M. SHARWOOD, B.SC. (MELB.)	Allergic Research.

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

MARIE L. CRANAGE, B.SC. (MELB.) (Resigned)	Biochemist.
JEAN C. TOLHURST, M.SC. (MELB.)	Bacteriologist.
CHARLOTTE M. ANDERSON,* M.SC.	Attached to Physiological Department.

Scientific Personnel and Assistants: Full Time (Continued)—

Miss Jean P. Marks . . .	Biochemist.
Mr. Glen Buckle	Assistant Bacteriologist.
Mr. Maxwell Swan . . .	Assistant.
Mr. Douglas Wilson . . .	Assistant.
Mr. Maxwell Hume . . .	Assistant.

(*b*) *Part-time Worker*—

Mr. A. H. Ennor	Assistant.

Secretarial:

Miss Edith Ross	Secretary to the Director and Librarian to the Institute.

Animal Attendants:

Mr. Alex. Gray	
Mr. Roy Smith	Assistant.

PATHOLOGICAL DEPARTMENT.

Medical Personnel:

(*a*) *Full-time Workers*—

R. A. Willis, M.D., B.S., D.Sc. (Melb.); M.R.C.P. (London) .	Pathologist to the Hospital.
H. W. S. Laurie, M.B., B.S. (Melb.) (Resigned) . .	Assistant Pathologist.
G. W. Watters, M.B., B.S. (Melb.)	Assistant Pathologist.

(*b*) *Part-time Workers*—

Professor P. MacCallum,* M.C., M.A., M.Sc. (N.Z.), M.B., Ch.B., D.P.H. (Edin.)	Hon. Pathologist to the Hospital.
Alfred J. Tringa,* M.D., B.S. (Melb.), F.R.C.S. (Eng.), F.R.A.C.S.	Hon. Curator of the Pathological Museum.

Scientific Personnel and Assistants:

Mr. A. Hyams	Bacteriologist.
Mr. Reginald Prosser . . .	Histological Technician.
Mr. H. Quigley	P.M. Attendant
Mr. Albert Brown	Assistant.
Mr. John F. Nelson . . .	Assistant.
Mr. Kenneth Johnson . .	Assistant.
Mr. Lewis Booth	Photographer and Assistant to Pathologist.

*Denotes Honorary Workers.

Eleventh Annual Report

of the Baker Medical Research Institute

30th April, 1937.

Gentlemen,

During the year just closing several changes have occurred in the personnel of the Institute. Miss Irving has left us to take up work at the Orthopaedic Section of the Children's Hospital, Frankston. Mr. Heath, Surgeon Dentist, was given facilities by you to do research work for a thesis for the Degree of Doctor of Dental Science.*

Dr. Frank Trinca applied in May, 1936, for permission to investigate the causation of rheumatism, and to that end put forward a scheme under which he was to finance Mr. Healey, an assistant, for a period of six months. He was confident that there would be no difficulty in getting money for this purpose because of the general interest in rheumatism. However, after four and a half months' work, Dr. Trinca found that subscribers did not respond to his appeal as he anticipated, but the Commonwealth Government being prepared to finance the work provided accommodation for Mr. Healey at the Commonwealth Serum Laboratories to continue his work on rheumatism under Dr. Trinca's direction.

Dr. Travers resigned from his position as Curator of the Ophthalmological Section of the Museum on account of the claims of his private practice and his clinical research, and Dr. Adelaide Gault was appointed to undertake the duties which Dr. Travers had relinquished.

During the year two of the lady members of the staff announced their engagements, Miss Ross and Miss Cranage. Miss Cranage left the Institute to be married, while, fortunately, Miss Ross was able to marry and continue her work.

For some years maternal mortality has been the subject of very earnest consideration and research by Miss Butler and the writer. They have pointed out the possible danger of anti-streptococcal serum in the treatment of the fever of child-bed. Their work in this direction has been supported by Dr. Leonard Colebrook, of Queen Charlotte's Hospital, London. They have also studied the dangers arising from infection through the operation of the induction of labour, and have investigated a

*It has just been announced that Mr. Heath has been awarded the degree.

series of such infections and their danger to the life of the infant. In an attempt to investigate the cause of eclampsia, however, they were not successful, but the writer stated a theory of the causation of eclampsia which provided a scheme of work for investigation of the disease. This, however, was to be costly, and, with your authority, a Committee was formed representative of the Women's Hospital, the Pathology School of the University of Melbourne, and the Baker Institute, to investigate the scheme and to report on its advisability. The Committee consisted of Professor Peter MacCallum, Professor of Pathology; Professor Marshall Allen, Professor of Obstetrics, both of the University of Melbourne; Dr. Mollison, Pathologist of the Women's Hospital, and the writer. These gentlemen considered the scheme carefully, and thought it was well worthy of investigation. It was submitted also to the Chairman of the Staff of the Women's Hospital, and met with his hearty approval. The cost of the scheme would have been £750 a year for two years, and the Commonwealth Government was approached for this small endowment, confidently anticipating, after its declared interest in the reduction of maternal mortality, that there would be no question about getting the sum asked for.

Eclampsia is a very fatal disease, having a mortality rate in British countries of about 20-30 per cent. It is to be hoped that the technical difficulties of the absence of application forms and other trifling obstacles will not stand in the way of the Eclampsia Committee of Melbourne to investigate a very grave disease of women.

Five of our young men, Messrs. Wilson, Brown, Swan, Nelson, and Johnson, worked so well in their respective evening studies that you awarded them each an honorarium.

The writer recovered from his illness of the previous year, and was able to resume duty on the 1st May, 1936. He has now completed a year's service without having to take any sick leave.

The Medical Staff of the Hospital has for many years grievously felt the need of a clinical photographer, so that more complete and graphic histories of cases of great scientific interest might be made. On that account, therefore, a sub-committee, of which Dr. Cox was the convener, was appointed to consider this project. The result was that the Hospital undertook to provide for Dr. Willis an assistant who would be responsible, under his direction, for the photography of the Hospital and the preparation of specimens for the museum. The Baker Institute was able to facilitate this arrangement by placing

about £125 worth of photographic equipment at the disposal of Dr. Willis. This rearrangement of the photographic work of the Hospital has been an unmitigated blessing. Photographs of first quality can be got at short notice, and Mr. Doutch has been relieved to quite a substantial extent of one of the many encroachments on his time.

The work of producing a prophylactic of gas gangrene has been proceeded with intensively, and with every promise of success. In addition, a great deal of thought and literary research has been given to the mode of spread of meningitis, which invariably breaks out in military camps, and, though in this matter we have not reached finality, we are investigating possibilities that look at present hopeful.

During the year the third monograph of the Baker Institute has been published, dealing with "Blood Cultures and their Significance," but, although several private expressions of favourable opinion by notable medical scientists have arrived at the Institute, there has not been time for the appearance of press notices, which we impatiently await. The cost of the publication of this monograph was borne in part by the publishers, hut to the extent of £200 by the Monograph Fund of the Institute. It will be a most useful book for the consideration of the consulting physician and the practical medical bacteriologist, and should have a wide distribution.

During the year we received £200 from Mr. Hughes as Minister of Health of the Commonwealth, in support of the work of Miss Jean Tolhurst on gas gangrene. In addition, we received £140 from the Felton Bequests' Committee for the purchase of a polarimeter. This gift saved us a duty of £60.

Dr. Frank Trinca provided the salary of Mr. Healey for four and a half months, and Mr. R. H. Wilkins contributed to our equipment.

We are greatly indebted to Mr. Robert Fowler, Gynaecologist of the Hospital, for the gift for many years of "Surgery, Gynaecology and Obstetrics," one of the best of the American journals, "The Australian and New Zealand Journal of Surgery," and the "Proceedings of the Staff Meetings of the Mayo Clinic."

The financial year of the Institute will now end on 31st December, and not, as heretofore, on 31st March.

ROUTINE WORK FOR THE YEAR ENDED 30th APRIL, 1937.

During the year the following routine laboratory work was carried out:—

Pathological Department:

Post Mortem Examinations	298	
Examinations of Sputum for T.B.	394	
Micro. Examinations of Urine	954	
Micro. Examinations of Pus and Other Fluids	147	
Blood Examinations	624	
Microscopical Sections—		
(a) Biopsy and Surgical Cases	648	
(b) Post Mortem Sections	516	
(c) Research	456	
Guinea-pig Inoculations	63	
Throat Swab Examinations	1,333	
	——	5,433

Biochemical Department:

Test Meals	361	
Blood Urea Estimations	638	
Urea Concentration Estimations	246	
Urea Clearance Tests	28	
Blood Sugar Estimations (Single)	385	
Blood Sugar Curves	112	
Cerebrospinal Fluid Examinations	276	
Basal Metabolic Rate Estimations	107	
Fouchet Tests	21	
van den Bergh Tests	26	
Occult Blood Tests	132	
Diastase Tests	44	
Blood Calcium Estimations	23	
Benedict Tests	284	
Acetone Estimations	196	
Blood Cholesterol Estimations	7	
Lange Reactions	245	
Miscellaneous	46	
	——	3,177

Electrocardiograms 361

Bacteriological Department:

Wassermann Tests	1,866	
Gonococcal Complement Fixation Tests	121	
Blood Cultures	94	
Sundry Cultures	382	

Vaccines	207	
Investigations for Typhoid and Dysentery	95	
Agglutination Tests	37	
Pneumococcal Typing	1	
Sundry Smears	49	
Examinations for Gonococci	2,953	
Dark Ground Examinations	14	
		5,819
Total		14,790

RESEARCH WORK.

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

(The names of authors are arranged in alphabetical order.)

CHARLOTTE M. ANDERSON:

"The Pituitary Gland and Carbohydrate Metabolism." Thesis accepted for the M.Sc. Degree. Awarded 2nd class honours and an exhibition and research grant of £150.

A. RUSSELL BUCHANAN:

"The Lange Colloidal Gold Reaction as a Routine Test: A Preliminary Note on the Results." In the press.

H. M. BUTLER:

"Blood Cultures and Their Significance." Churchill, London, February, 1937. The 3rd monograph of the Baker Institute.

"The Grouping of Haemolytic Streptococci." In preparation.

A. B. CORKILL:

"The Value of the Rectal Administration of Glucose." Appeared in the "Medical Journal of Australia," 1936, Vol. 1, page 807.

A. B. CORKILL and A. H. ENNOR:

"Choline Esterase in Myasthenia Gravis." In preparation.

LEONARD B. COX:

"Tumours of the Base of the Brain: Their Relation to Pathological Sleep and Other Changes in the Conscious State." Appearing in the "Medical Journal of Australia," 15th May, 1937, page 742.

"A Case of Syringomyelia, Associated with an Intramedullary Tumour, with Remarks on the Relation of the Gliosis to Tumours of Ependymal Origin." Appearing in the "Journal of Pathology and Bacteriology," 1937, vol. 44, page 661.

LEONARD B. COX and MARIE CRANAGE:

"Observations on the Tissue Culture of Intracranial Tumours." In preparation.

LEONARD B. COX and ISOBEL M. MCPHEE:

"Observations on the Metabolism of Calcium and Phosphorus in Three Cases of Acromegaly, One Showing Osteoporosis." Appeared in the "Medical Journal of Australia," 1936, vol. 2, page 390.

NOEL E. E. HEATH:

"Lung Abscess After Dental Operations." Thesis to be submitted for the Degree of Doctor of Dental Science. In preparation.

H. W. S. LAURIE:

"A Case of Acromegaly, with Clinical and Post Mortem Findings." Appeared in the "Medical Journal of Australia," 1937, vol. 1, page 133.

"A Case of Chloroma with Associated Cavitation of the Spinal Cord." Appearing in the "Medical Journal of Australia," 15th May, 1937, page 753.

JEAN P. MARKS:

"Blood Ketone Bodies in Health and Disease." In preparation.

J. A. MCLEAN:

"The Deficiency Anaemias." Appearing in the "Medical Journal of Australia," 1st May, 1937, page 667.

J. A. MCLEAN and MARY PHILLIPS:

Investigation of the Properties of a New Preparation in the Treatment of Haemophilia.

H. BOYD PENFOLD:

"The Signs and Symptoms of Taenia Saginata Infcstation." Appeared in the "Medical Journal of Australia," 1937, vol. 1, page 531.

"The Life History of Cysticercus Bovis in the Tissues of the Ox." Appeared in the "Medical Journal of Australia," 1937, vol. 1, page 579.

"An Attempt to Immunize Lambs Against Infestation with the Eggs of the Hydatid Parasite." Essay submitted for and awarded the Armytage Prize. Supporting papers on helminthological studies on Saginata taeniasis in the human and bovine also submitted at the same time.

W. J. PENFOLD and H. M. BUTLER:

"Placental Infections in Induced Labour, with Special Reference to its Relationship to Foetal and Neo-natal Mortality." In the press.

"The Cultivation of Treponema pallidum." In preparation.

W. J. PENFOLD and JEAN C. TOLHURST:

"Formol-Toxoids in the Prophylaxis of Gas Gangrene." In the press.

W. J. Penfold, H. Boyd Penfold, and Mary Phillips:

"Cysticercus bovis and its Prevention." Appeared in the "Journal of Helminthology," 1937, vol. 15, page 37.

"The Distribution of Cysticercus bovis in the Sites of Election in the Ox." In the press.

"Ridding Pasture of Taenia saginata Ova by Grazing Cattle or Sheep." Appeared in the "Journal of Helminthology," 1936, vol. 14, page 135.

"Taenia saginata: Its Growth and Propagation." Appeared in the "Journal of Helminthology," 1937, vol. 15, page 41.

"The Criteria of Life and Viability of Mature Taenia saginata Ova." In the press.

"Artificial Hatching of Taenia saginata Ova." In the press.

Marjorie M. Sharwood:

"Further Studies of the Pollen Content of the Melbourne Air." Appeared in the "Medical Journal of Australia," 1937, vol. 1, page 117.

J. Sutherland:

"A Note on the Lange Test and on the Preparation of Colloidal Gold." In the press.

Alfred J. Trinca and R. A. Willis:

"Primary Carcinoma Unsuspected by the Clinician." Appeared in the "Medical Journal of Australia," 1936, vol. 2, page 222.

R. A. Willis:

"The Growth of Embryo Bones Transplanted Whole in the Rat's Brain." Appeared in the "Proceedings of the Royal Society, London," 1936, vol. 120, page 496.

"A Cervical Uterine Polypus with a Tuft of Hairs." Appeared in the "Journal of Pathology and Bacteriology," 1936, vol. 43, page 223.

"A Further Study of the Structure of Teratomata." Submitted to the "Journal of Pathology and Bacteriology."

R. A. Willis and D. B. Rosenthal:

"The Association of Chromaffin Tumours with Neurofibromatosis." Appeared in the "Journal of Pathology and Bacteriology," 1936, vol. 42, page 599.

R. A. WILLIS and J. SUTHERLAND:

"A Case of Endocarditis Due to a Diphtheroid Bacillus structurally and culturally resembling the Diphtheria Bacillus." Appeared in the "Journal of Pathology and Bacteriology," 1936, vol. 43, page 127.

Of the research work previously recorded, I might make mention of "Blood Cultures and their Significance," the third monograph of the Baker Institute. Miss Butler's monograph has been published for some months now, but few of the press reviews have appeared. "The Practitioner," an English journal, states: "This is an admirable book, and should be a valuable source of reference." "The Lancet" reviewer expresses the opinion: "A book of this description serves as a reminder of the results achieved by blood culture, and no bacteriologist, however senior, will feel that the time spent in reading Miss Butler's book has been wasted." It is a book for the bacteriologist, and will enable him to do his blood culture work well, but it is equally good for the clinician, and will enable him to interpret the results obtained clinically.

Dr. Rowden White loaned to the Institute a Zeiss-Pulfrich photometer, which Mr. Doutch has used for the determination of urinary creatinine. The difficulty in this estimation by means of the Jaffe's reaction is that, in addition to the colour developed by the substance to be estimated, there is also present some colour due to one of the necessary reagents, in the case of the Jaffe's reaction, picric acid. The Pulfrich photometer, being provided with filters that transmit an extremely narrow band of the spectrum, has proved admirable in overcoming to a large extent the errors found in ordinary colorimetric estimations of this type. Thus Dr. Corkill has found the instrument of extreme value for determinations of reduced glutathione in tissue extracts. Mason recently demonstrated that the original iodine titration method for glutathione gave values that were too high and developed a method in which glutathione was titrated with ferricyanide, ferric salt was added, and the intensity of the blue colour that developed was determined in a colorimeter. Here again the presence of a slight excess of yellow ferricyanide in the final blue solution makes a colour comparison extremely difficult, whereas by choosing appropriate filters the estimation can be carried out in the photometer without any colour interference. Details of these methods will shortly be published.

Dr. Corkill, together with Miss Phillips and Miss Marks, is investigating several aspects of levulose metabolism, about which considerable controversy exists. The work is being directed to determine whether there is any physiological justification for the application of the levulose test for hepatic efficiency. The

question whether levulose can form glycogen as readily as glucose is as yet undecided. The procedure is to compare the muscle glycogen deposition when insulin is injected into an animal receiving an intravenous infusion of either glucose or levulose. These experiments are still in progress. Attempts have been made to compare the effects of levulose and glucose in promoting a deposition of liver glycogen when fed to young rabbits, but the results are very conflicting. Apparently the rabbit is unsuitable for such experiments, some animals showing a rise in blood sugar after the oral administration of levulose, and others not. The results as regards liver glycogen are likewise contradictory. The question as to whether levulose causes a rise in blood lactic acid is also being investigated. After the initial hyperglycaemia has disappeared and the blood sugar and lactic acid are at a steady level, a levulose solution is injected intraperitoneally. In the preliminary experiments no increased blood lactic acid content has been found, but further work is being carried out.

Dr. Corkill and Mr. Ennor have studied the choline esterase in the blood of patients suffering from myasthenia gravis. Their investigations have extended over a period of eight months. The early experiments were carried out on the rabbit's intestine, but later on, at the suggestion of Dr. Feldberg, the frog's rectus muscle was used. Their results corresponded with those of McGeorge. They found the choline esterase of normal individuals and of patients suffering from diverse conditions to show wide variations which bear no relationship to the patient's clinical condition.

Miss Anderson, working in Dr. Corkill's section, has investigated certain aspects of the relation of the anterior pituitary gland to carbohydrate metabolism. Most of her experiments were performed with a saline extract of an acetone dried pituitary powder. The most striking effect of a saline extract, administered by subcutaneous injection, was definitely to inhibit the deposition of liver glycogen after the intravenous injection of Na lactate. Miss Anderson's experiments tend to confirm the suggestion that the lessened hypoglycaemic effect of insulin in animals treated with anterior pituitary extract is due to the fact that such treatment sensitises liver glycogen to the glycogenolytic action of adrenaline. At present Miss Anderson is continuing her investigations to see whether the effect of extract on glycogen metabolism is due to "Prolactin" or some other factor in the anterior pituitary. These observations are of importance in that they demonstrate that, apart from an inhibition on the hypoglycaemic action of insulin, the anterior pituitary exerts an influence on glycogen metabolism.

Dr. Cox, in investigating tumours of the base of the brain in their relationship to pathological sleep and other changes in

the conscious state, concluded that cases of tumour unassociated with internal hydrocephalus, involving the mid-brain, hypothalamic and thalamic regions, were each accompanied by certain changes in the conscious state. These changes included drowsiness, hypersomnia, trance-like conditions, periods of apathy, catatonic states, alterations in disposition, disorientation for time and place, marked loss of memory, and mental excitement. In certain cases the removal of the tumour resulted in recovery from the abnormal state. An attempt was made by Dr. Cox to explain the condition of lessened consciousness as a disturbance of a sleep mechanism. A working hypothesis is formulated based on the possible relation of sleep to an inhibitory process. It is indicated that the region of the brain stem, hypothalamus and basal ganglia may be of importance in the better understanding of the problems of insane conduct.

Dr. Cox described further a case of syringomyelia associated with an intramedullary tumour. The walls of the syringomyelic cavities were of uniform structure, and composed of polar glia. They were thought to be derived from the ependymal zone of the developing cord. The tumour was astrocytic in structure, but contained many polar cells similar to those in the walls of the cavity. The relation of polar glia to ependymal cells and to astrocytes was discussed.

Dr. Cox and Miss Cranage, in their paper on the tissue culture of intracranial tumours, observed that migration occurred from the explants of four out of nine mengiomata. Certain of the migrating cells of tumours 1 and 2 closely resembled in their structure and arrangement neoplastic cells. One occurred in sheet formation, and the other as strands of polar cells. These cells failed to segregate trypan blue, and were judged to be neoplastic. From tumour 3, polar cells migrated which segregated trypan blue lightly; these may have been neoplastic. From tumour 4, polar cells migrated at an early stage, but could not be identified. The majority of the cells were of the monocyte-macrophage series, and segregated trypan blue densely. Migration occurred from one out of four peri-neural fibro-blastomata cultured. Certain of the migrating cells were judged to be neoplastic, as they resembled the small polar cells observed in section and did not segregate trypan blue. The one medulloblastoma cultured showed a dense sheet-like growth of small neoplastic cells, many being in mitosis. A migration of typical astrocytes was obtained from two out of nine astrocytomata cultured. Migration occurred from two out of three glioblastomata cultured. The migrating cells were polymorphic, and closely resembled those observed in section. They did not segregate trypan blue, and were judged to be neoplastic.

Miss Marks has been engaged on the estimation of blood ketone bodies in health and disease, but her work is not in such a position that it is ready for publication.

Dr. H. Boyd Penfold has written a paper on the signs and symptoms of Taenia saginata infestation. The signs and symptoms that were apparent before infestation and after cure are excluded from the review. Those that were present only during the infestation are tabulated and critically considered. The blood findings in 20 cases of saginata taeniasis are given, and they show an extremely small percentage of eosinophilic cells, only one getting up to 13%. Among the other nineteen, one only showed 6%. There was a marked increase in lymphocytes, which reached 59%, 51%, and several 50%.

The life history of Cysticercus bovis in the tissues of the ox was extremely interesting. Under the conditions of the experiment it showed that no cysticerci lived longer than nine months, and the majority were dead before they were four months old. The length of life of cysts varied greatly in the same and in different animals. The age of cysticerci over six to eight weeks usually cannot be estimated accurately. Degenerated cysts greatly diminished in size with age, until they were completely absorbed or, in some instances, left residual minute fibrous tissue scars.

In ridding pastures of Taenia saginata ova it was shown that 349 eggs developed in the first group of cattle that fed on the contaminated plot of ground, and the second group of cattle showed only 13.5% infected as against 100 in the first group. The third group of cattle showed .6% infected and only two cysts were found, a reduction of effective accessible eggs to .6% of the original number.

It was found that the length of Taenia saginata in the contracted state varied in different specimens from 9 to 20 feet. In the relaxed state it varied from 15 to 32 feet. The average rate of growth of Taenia saginata in the patients on whom we made observations in this regard was apparently 8 to 9 segments per day. We found the number of segments in a complete Taenia saginata to vary from 700 to 950. The longevity of Taenia saginata in two of our cases harbouring only single worms when treated by us has reached 35 years. If not disturbed by treatment, the length of life of Taenia saginata is probably determined by the death of the host. One case of multiple infestation lasted continuously for 60 years. The average number of eggs per segment was of the order of 80,000, but varied within wide limits in different specimens from 5000 to 130,000.

Placental infections in induced labour are of great importance. In the normal labours studied the placentas have not shown

B. coli, aerobic non-haemolytic streptococci, nor B. welchii. Moreover, they have shown no mixed infections, while the placentas derived from tubally induced labours have shown all these organisms. Mixed infections have also been frequent. If there has been a prolonged interval between the induction of labour and the delivery of the child, the risk of infection of the placenta is greatly increased. The infections of the placenta with B. coli, aerobic non-haemolytic streptococci, and B. welchii have been associated with a high infantile mortality. Mixed infections of the placental tissue and infections of the large foetal vessels of the placenta are specially serious for the infant. The bacteria cultivated from the dead infant are usually similar to those obtained from the placenta, but they may not be so, and when additional organisms are present in the foetus their source is probably an infected liquor amnii. When B. coli has been found in the placenta and in the body of the dead infant, the strains isolated have been biochemically and serologically identical.

Miss Tolhurst and the writer have been occupied with the investigation of formol-toxoids in the prophylaxis of gas gangrene. They have shown that formol-toxoids of B. welchii, which have been rendered atoxic for mice in one cubic centimetre quantities intraperitoneally produce effective immunity in animals when given in from four to eight large injections. Suspensions of alum precipitates of similar formol-toxoids given in two small injections a month apart are excellent immunizing agents in animals. Both active and passive immunity have been demonstrated. The purpose of this research was to determine whether the prophylaxis of gas gangrene in man by the use of formol-toxoids was a feasible proposition or not. Our animal experiments suggest that it is, and at an early date we hope to apply it experimentally in man.

Dr. Willis has demonstrated the growth of embryo bones transplanted whole into the rat's brain. He has also submitted to the "Journal of Pathology and Bacteriology" a further study of the structure of teratomata. He has critically examined all these teratomata, determining the lining membranes of their cysts and shown the association between nervous tissue and bone and cartilage. The correlation between nervous tissue and bone and cartilage seems to be extremely well marked. The lining of the teratoma by skin is simply fortuitous, and these cysts should not be called dermoid cysts.

The financial statement for the year is appended.

(Signed) WILLIAM JAS. PENFOLD,
Director.

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

THE THOMAS BAKER, ALICE BAKER, AND ELEANOR SHAW MEDICAL RESEARCH INSTITUTE.

Financial Statement, 1st April, 1936, to 31st December, 1937.

RECEIPTS.						EXPENDITURE.					
To Balance at 31st March, 1936				£28	1 5	By Medical Salaries		£1,816	13 4		
„ Thomas Baker (Kodak), Alice Baker and Eleanor Shaw Benefactions	£4,900	0	0	4,900	0 0	„ Other Salaries and Wages		2,517	7 4	£4,334	0 8
„ Grants—						„ Drugs, etc.		178	4 9		
Alfred Hospital	500	0	0			„ Instruments and Glassware		551	9 3		
Commonwealth Department of Health	200	0	0			„ Experimental Apparatus		361	14 1		
				700	0 0	„ Additions to Outhouses		207	9 0		
„ Donations—						„ Sundry Furnishings and Apparatus		127	12 3		
Alfred Felton Trust	140	0	0			„ Fuel and Lighting		119	17 1		
J. J. Rouse, Account Rouse Unit	38	2	7			„ Insurance		36	19 10		
Dr. Frank Trinca	10	0	0			„ Repairs		10	5 2		
Dr. Robert Fowler	3	0	0			„ Library		126	6 0		
R. H. Wilkins	2	10	0			„ Printing and Stationery		42	16 8		
				193	12 7	„ Travelling		5	10 0		
„ Interest—						„ Monograph		251	17 6		
Australian Consolidated Loan	637	10	0			„ Sundries		85	15 4		
Alfred Hospital	21	1	8							2,105	16 11
				658	11 8					£6,439	17 7
						„ Balance				403	13 0

„ Proceeds of Sale of Monographs . .	4	12	6		
„ Proceeds of Sale of Equipment and Serums	92	18	3		
„ Medical Fees	265	14	2		
	£6,843	10	7		£6,843 10 7
To Balance at 31st March, 1936	£403	13	0		

We have audited the above Statement, and certify it to be correct,

Melbourne,
19th May, 1937.

FLACK & FLACK,
Honorary Auditors.

Spectator Publishing Co., Printers, Melbourne