

Twentieth Annual Report

of the

MONTREAL NEUROLOGICAL INSTITUTE

and the

DEPARTMENT OF NEUROLOGY

AND NEUROSURGERY

MCGILL UNIVERSITY

1954-55



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# REPORT OF THE DIRECTOR

WILDER PENFIELD

Mr. Principal: We turn today and look back upon the twentieth year in the life of this Institute. It is the first year of travel along the highroad after that difficult turning point, the Second Foundation. A new harness has been fitted, strong young workers added, and each member of the team now pulls according to the strength the Good Lord gave him, knowing that the future of the common cause is secure for a season.

Some members of the team have already presented their reports: Theodore Rasmussen on Teaching and the Scientific Laboratories, Francis McNaughton on Neurology, William Cone on Neurosurgery, Herbert Jasper on Graduate Studies, Preston Robb on Hospitalization, Miss Flanagan on Nursing, Miss Beatty on Social Service.

I myself took three months away last autumn to deliver medical lectures in England, France, Italy, Greece and Turkey. In addition to that I must confess that I found time to satisfy a long felt desire to explore the background of the Father of Medicine, Hippocrates of Cos.

On December 1st I returned to the newly created post of Chairman of this University Department and slipped back into the old post of Director of the Institute. Since then I have been hard at work again at neurosurgery and research. Thus, you see, in spite of rumours to the contrary, I have not retired, nor is there any immediate prospect of it!

## ACADEMIC AND SCIENTIFIC

There is little for me to add to the report of Professor Rasmussen. Herbert Jasper's weekly seminar for progress reports on research has been a great success, providing guidance for investigators of all ages and various categories.

A ceiling on income from practice was introduced for the first time. This applies to Dr. Rasmussen and me, establishing the so-called Harvard University half-time scheme. Income above the established ceiling will be paid into the academic budget.

A small portion of the income from the Lily Griffith McConnell Foundation for Neurological Research was used to make the academic reorganization possible. But the major portion of the income from this fund has been used to make expansion of laboratory work possible, even in the face of rising costs of technical help and materials. And none of the scientific endowments or grants is allowed to cross over to the hospitalization budget.

## HOSPITALIZATION

You have heard the report of the Assistant Director in charge of Hospitalization, Dr. Preston Robb. With the guidance of our Consultant in Hospitalization, Dr. Gilbert Turner, he and the Business Manager, Mr. Donald Bain, have built up a more independent organization of administration in the Institute Hospital.

We have just finished the first full year after the Institute's Second Foundation. It was our firm determination that the inevitable clinical deficit should amount to less than the annual sum lately contributed to our hospitalization costs by the Province and the City. We have not succeeded in this, but I believe that in the coming year we may yet retrieve this failure. During some months in the past year, the red in the reckoning was replaced by black. Room charges are to be raised reluctantly to a more realistic figure. Running expenses have been reduced and nursing costs cut.

We are determined to balance the clinical budget as we did in the early days of the institution and as we have always done for the scientific budget. In the long run, the greater part of the financial burden of the hospital unit of this Institute must depend upon what patients can pay. If the bed occupancy could have been held at 15% private, 35% semi-private and 50% public, the deficit of hospitalization would have been within the sum of money available for clinical purposes.

This was the proportion anticipated when the McConnell Wing was added. It was the proportion for which we had budgeted when we asked the Province of Quebec and the City of Montreal to give us an annual grant to meet public patient deficits. Our beds have been filled, of course, but we have often allowed the public occupancy to exceed its allotted proportion, yielding to the pressure of public need.

This proportion can be altered, provided the demand is great enough from those patients who can pay. Therefore budgetary success depends upon recognition of the outstanding ability of the staff.

### A BILINGUAL INSTITUTE TO SERVE THE GENERAL HOSPITALS

It will be our policy to enlarge the permanent clinical staff still further, giving preference, in the immediate future, to men whose primary language is French until an appropriate balance is reached. It should be remembered that our objective is to demonstrate the fact that the Montreal Neurological Institute is a bilingual institute in a bilingual province.

Neurological and Neurosurgical Services have been created in the general hospitals since the Royal Victoria first formed her Department in 1928 and that Department was converted into this Institute in 1934. But there are certain medical conditions for which only the Montreal Neurological Institute is equipped, conditions for which treatment techniques are always in readiness here.

For example, McRae's X-ray procedures and Jasper's electroencephalographic

laboratory give to us, less expert members of this clinical staff, a remarkable advantage. It is not an idle boast to claim that there are things that can be done here and not elsewhere.

Leadership is the function and the purpose of the Montreal Neurological Institute. That does not mean that we are in competition with specialists in other hospitals. Quite the contrary! There is so much work to be done in the field, and unlimited opportunity for future advance. It is our job to enlarge the field, in which others work.

Our formal relationship to other hospitals varies greatly of course. The Montreal General and the Montreal Childrens' Hospitals have a particularly close relationship with us. Indeed the interlocking staff and the arrangements for patient transfer provides service similar in effectiveness to that given to the Royal Victoria. One of our major pre-occupations in the year that lies ahead will be the planning of cooperation with these two rebuilt and reorganizing institutions, so that any advantages we may have here may be easily available to them for their patients.

In 1954 the Royal Victoria Hospital celebrated her Diamond Jubilee — sixty years of splendid public service. In a sense we have played a role in the second half of that period, for it was in 1928 that Professor Archibald became Chief of the Surgical Service. His first act was to set up a Sub-department of Neurosurgery. Professor Jonathan Meakins combined with it the Sub-department of Neurology and so the Governors of the Hospital created a combined Department.

Six years later the Montreal Neurological Institute opened its doors and the new Department moved across the street to become a daughter institution. But the Hospital refused to accept financial responsibility for the off-shoot. So it came about that the M.N.I., in University hands, is now a neighbour institution. The cooperative inter-relationship is close. It works well.

This year the Royal Victoria Women's Auxiliary, under the Presidency of Mrs. Sidney Dawes, has extended its field of service to include this Institute. A new sub-committee was set up with Mrs. Ronald Riley as Chairman, and a generous anonymous donor made it possible for us to build a Coffee Shop, to be operated by the Auxiliary. We are grateful to the Vice-Chairman, Mrs. Peter Laing, and her volunteer aides for their service in this center of good cheer and for the much needed income derived from it.

### SCIENTIFIC GROWTH

There are certain urgent needs for the coming year. The grant of \$20,000.00 which we have received annually from members of the Bronfman family, on a five-year basis, has reached its final year. We hope now that endowment may make permanent the work that this generous grant initiated in Jasper's department.

We hope, also, for a permanent fund to support the research fellowship plan for training graduate students which Dr. Rasmussen has visualized.

## A NATIONAL PERSPECTIVE

This is a time of prosperity, of uneasy peace and fretful security. We feel the close stillness that might foretell a final storm. The wind of fear stirs and lightning flickers on the national horizon, while men talk among themselves of atomic weapons. This Institute is one of the organizations which would serve the people in war as in peace.

Our research receives some of its support from the Federal Government this year, as it has for the past seven years, in the form of a "Consolidated Grant." We have asked that the assistance be increased. We urge now that it be made permanent by endowment. Strength in research and in higher education throughout the land is national strength.

Considered from the point of view of many institutions, other institutions, as well as our own, the assistance that is needed from Ottawa is endowment rather than the present annual grants which bring the National Government into competition with other agencies of support. Permanency of support should be given selectively, strategically, from the point of view of national need.

A recent editorial in the Montreal Gazette, entitled "Pebbles on the Shore", recalled the words of Isaac Newton: "I do not know," he wrote, "what I may appear to the world, but to myself, I seem to have been only a boy playing on the sea-shore, . . . diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me."

For us in the Neurological Institute the undiscovered "ocean of truth" lies, not in the limitless universe about and beyond us, but in the equally limitless universe within us. I refer to the nervous system, the brain, and the springs of man's behaviour. We know that the truth, which the world needs so much, could come in no small measure from permanent establishment of continuing study in this field. Let me close with a quotation from my report of last May: "Individuals, like political parties, must come and go, for better or worse, but sound scientific advance, like wise government, should be maintained in certain fields on a continuing permanent basis."

## RESEARCH

DR. HERBERT JASPER

During the past year the various research departments of the Institute completed their "shake down cruise" in their new laboratories and have settled down to smooth and productive work. Increased space and facilities are already being used to the full. An increase in both the quality and quantity of work done has been the result, in addition to greater pleasure and satisfaction for those engaged in it.



A most important development has been the inauguration of weekly research conferences. Each Monday noon we lunch together and discuss research in progress from all departments, from staff and fellows alike. This has done much to maintain the close cooperation and intimate community of interest which was endangered by the expansion of the last few years. Rather than duplicate reports of separate sub-departments, the following list of problems discussed at these conferences will serve to highlight some of our principal activities during the past year.

Following a brief survey of all projects in progress, of which there were over 25 in number, Dr. Wilson reviewed the literature on the effects of hyperventilation and outlined his work in alveolar  $\text{CO}_2$ , blood K, and blood sugar changes during hyperventilation in relation to changes in the electroencephalogram, with particular reference to the investigation of how hyperventilation induces seizures in patients with petit mal epilepsy. It is hoped that such studies might lead to a better understanding of the pathophysiology of petit mal and related forms of epilepsy.

Reports from the Donner Laboratory of Neurochemistry included studies of nucleic acid content in relation to cell density of brain tissue in the analysis of respiratory rate of brain tumors, as compared to normal brain, studies of acetylcholine content of brain tissue, studies of K and  $\text{H}_2\text{O}$  movement across nerve cell membranes in relation to brain metabolism and the mechanisms of brain oedema and studies of the effects of anoxia and lack of glucose upon brain metabolism. The reports by Drs. Florey and McLennan on the isolation of substances from brain tissue which have strong inhibitory or excitatory effects on the activity of the central nervous system were outstanding. In minute concentrations, their inhibitory substance will arrest the discharge of stretch receptors and block transmission in certain synapses, as well as having a protective action against strychnine convulsions in animals. The isolation of a naturally occurring inhibitory substance in the brain, if confirmed by further studies, may be a discovery of major consequence, not only for our understanding of normal brain function, but also for the rational treatment of brain disorders.

There is a growing body of evidence to suggest that the excessive discharge of the brain which causes epileptic seizures may be due, in many cases, to the lack of regulating or controlling mechanisms (or defective brakes) as much as it may be due to an excess of excitatory substance or hyperexcitability.

Studies in experimental neuropathology were represented by discussions of mechanisms of allergic encephalitis and the effects of cortisone and hydrocortisone upon the healing of simple brain wounds.

We may include in this category Dr. Rasmussen's report of the effects of hypophysectomy upon the rate of tumor growth with detailed studies of effects of Beta irradiation on the pituitary in man, administered by implantation of beads of radioactive Yttrium. Investigations of multiple sclerosis, being continued by Dr. Cosgrove, include electrophoretic analysis of serum proteins, which are beginning to show positive results which may give us another clue as to the nature of this most baffling disease. Dr. Penfield reviewed past and present conceptions of the nature and origin of epileptogenic lesions of the brain, with particular reference to the most common atrophic lesions of the temporal lobe. It was pointed out that we know little more today of the basic mechanism of epileptic discharge

than did Hippocrates when he concluded it was due to evil humors.

The Neuroanatomy laboratories were represented by a most important study of the pathways of the unspecific or intralaminar thalamo-cortical projection system. This has served to confirm many physiological studies and to go far in providing a solid anatomical basis for the thalamic portion of the centrencephalic integrating system which has commanded the attention of so many of us since its proposal by Dr. Penfield many years ago.

Dr. Penfield's conception of the centrencephalic system of the brain stem has inspired much of the work in the Neurophysiology laboratories as well. To neurophysiologists, such as Professors Magoun, Moruzzi, and their colleagues, this has come to be almost synonymous with the brain stem reticular system. Most important among these studies has been the demonstration of an adrenaline sensitive portion of the brain stem reticular system, in the upper midbrain and caudal diencephalon, which may be responsible for sustained arousal from sleep. This is a humoral mechanism for the maintenance of wakefulness, important also in the understanding of anxiety states and their control by adrenolytic agents, such as chlorpromazine.

Brain stem and cortical mechanisms responsible for the habituation to certain stimuli, so that they lose their effectiveness to awaken a sleeping animal, are also under investigation. We are beginning to get some insight into how we learn to sleep through monotonous stimuli, while novel or meaningful stimuli awaken us or command our attention. The electrical activity of the brain has also proved useful in studies of conditioning process in monkeys and the effects of chronic experimental epileptogenic lesions upon certain types of learning process. This may be important for our understanding of disturbances in learning and memory in patients with discharging lesions of the brain.

Finally, to conclude the wide field of research covered in our weekly conferences, we are now engaged in reviewing some of the extensive work being pursued by Drs. Karagulla and Milner who, with Dr. Penfield, have been continuing their studies of the psychiatric and psychological disturbances found in patients with temporal lobe epilepsy. This involves us in considerations of the neurophysiological basis of complex mental functions, such as memory, perception, hallucinations and abstract thinking.

Reflecting upon the work of our laboratories, it is obvious that steady progress is being made with much devoted labor, with rare glimpses of discoveries of more than incidental consequence. The most important problems still remain unsolved, though we have learned enough to give new direction to our search.

## TEACHING AND GRADUATE STUDIES

DR. THEODORE RASMUSSEN

The undergraduate teaching program of the past year has followed in the footsteps of the preceding years with little change in pattern. We have now finished the first complete academic year in the unequalled facilities provided by the addition of the magnificent McConnell Wing to the original building. In two weeks the new Montreal General Hospital will open its doors and before many more months have passed the new wing of the Royal Victoria and the new

building of the Montreal Children's Hospital will be finished and in service. The opportunities offered by these expanded facilities in the four major teaching hospitals affiliated with McGill, in which the teaching of neurology and neurosurgery is carried out, provides a stimulus to reconsider our overall teaching program.

The constantly increasing complexity of medical science reinforces the truth in the statement that time is the medical student's most precious possession. This time is competed for by the need for a broad general pre-medical background, by each of the basic preclinical disciplines and by the various clinical specialties. The time available for any one specialty, even one covering as broad a field as ours, is all too limited. The student therefore has the right to ask of the Faculty that each hour return maximum dividends, and the Faculty has the corollary right to ask of the student diligence and single minded attention to the task at hand.

In the past thirty years there has been a gradual reduction in the proportion of time spent in didactic teaching in most medical schools, with a corresponding increase in time allotted to clinical teaching. This trend is clearly continuing and the end point may not yet be in sight. As the time allotted to didactic teaching is reduced, the need for maximum efficiency in utilization of that time becomes more pressing, both as regards the content and the manner in which the material is presented. We must continually review the selection of subjects presented and explore the applicability of modern and audiovisual techniques.

To the properly prepared student, however, the patient himself is the best teacher. Clinics and ward rounds with group discussion will always play an important role in clinical teaching, but the student also needs a more active participation in the fascinating job of untangling the diagnostic puzzle each patient presents. I believe one of the most valuable aspects of the medical student's training is his contact with individual patients, taking the history, carrying out the examination and then following the laboratory work up, the treatment and the subsequent course of the patient and his disease. The new hospital facilities soon to be available will, we hope, allow the medical students a more extensive contact of this sort with clinical neurological and neurosurgical problems than has been possible in the past.

These few paragraphs outline in broad terms some aspects of the teaching program with which we will be concerned during the coming year.

Dr. Alan Gregg, in his address at the Second Foundation Exercises here a year and a half ago, commented on the necessity of a university teaching not only what is known, but also the best attitude to what is not yet known. And he expressed his opinion that learning the right attitude to the unknown was the vital core of an Institute such as this. We need to be sure that some of the flavor of this learning, which is distilled in its purest essence in the research laboratories, is permitted to reach the medical students.

Under the guiding hands of Dr. Penfield and Dr. Cone, the research laboratories of the Institute have gradually expanded and multiplied during the past twenty years until now all the major avenues of investigation of the nervous system are represented. One of the unique characteristics of these laboratories that has helped to make them so extraordinarily productive has been the constant

guidance provided by the patient himself as a result of the close association of clinician and laboratory scientist. With increasing complexities of technique and instrumentation however, communication becomes more difficult and the clinician tends to become more and more a stranger in these laboratories. Few will disagree with the idea that the clinician should be an essential partner in the research laboratory and becomes a better clinician as a result of this association. Unfortunately, time is not elastic and the economic facts of life act to lessen the time the clinician has to spend in the laboratory progressively as his experience and possible contribution to the laboratory increases. The Monday noon research seminars have helped compensate for this trend, but much more extensive participation by clinicians in the laboratory programs seems to me to be vitally important.

The military commentators of the last war depicted the progress of the armies' advance with curved broad shafted arrows converging on the objective. The research program of the Institute can similarly be portrayed as a five-pronged attack on brain disease, function and dysfunction, with arrows signifying the anatomical, pathological, physiological, chemical and clinical investigative activities.

In each of these beachheads studies of a basic nature, far removed from immediate clinical problems, are under way, along with investigations of a practical nature that are directly related to the care of today's patients. This seems to me an ideal goal for research laboratories of a clinical institute. The active participation of the clinician is necessary to pose the questions for the practical applied type of research problem, and indeed he is often best equipped to carry out the investigation. The clinician's influence may be no less important in furnishing general direction to the basic research program.

Long range goals must be set up for the basic research programs. For the foreseeable future the study of the epileptic discharging lesion will doubtless continue to be one of our major objectives. Each advance here pays big and immediate dividends in restoring afflicted persons to health and social usefulness and also contributes to our knowledge of normal cerebral function in man.

Tumors constitute another major affliction which is responsible for the arrival at the door of the Institute of many of our patients. The present day intensive world wide investigative attack on fundamental aspects of growth and more specific studies on neoplasia have a direct bearing on nervous system tumors. We must be prepared to follow clues provided by these studies. The first of malignant tumors of the body to be thoroughly understood and controlled may well be those of the nervous system, since these rarely present any problem of distant metastasis and all attention can be focussed on the primary growth.

The demyelinating diseases constitute a third major cause of neurologic disability whose etiology and pathophysiology may well be discovered with research techniques and tools already at hand.

We look forward to the coming year's work with eagerness and with hope that it will measure up to the standards established in the past.

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Assistant Director (Hospitalization).....	PRESTON ROBB
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Business Manager.....	MR. DONALD C. BAIN
Executive Secretary.....	MISS ANNE DAWSON

### RESIDENT STAFF — July 1954 — July 1955

Senior Residents.....	JOSEPH STRATFORD*, GILLES BERTRAND*
Neurosurgical Residents.....	JOHN MULLAN, JOHN ROTH
Neurological Resident.....	ARTHUR HUDSON
Neurological Service Assistant Residents.....	J. E. BETHUNE***, CHARLES BRANCH, JUANITA CASSELMAN, DENIS GIBLIN, N. DE LEEUW***, E. GREENBERG***, A. KNIGHT***, ANTONE TARAZI
Neurosurgical Service Assistant Residents.....	THEODORE HOFF*, VICTOR KLEIDER, RICHARD LENDE, BLAINE NASHOLD, MARK RAYPORT*, WARREN SIGHTS



Residents in Anaesthesia .....	ROMAN SLUZAR*, VIOLET FROST*, ALBERT TOMS*, CLARICE MCKIERNAN*
Residents in Neuroradiology.....	FRANK GRAINGER**, WALTER HENEGHAN**
Fellows in Neuroradiology.....	SIDNEY TRAUB*, JOHN WYLLIE*

\*Six months on this service.

\*\*\*On rotation from Royal Victoria Hospital.

\*\*Four months on this service.

## LABORATORY DEPARTMENTS

### *Electroencephalography and Electromyography*

Electroencephalographer.....	HERBERT JASPER, Ph.D., D.ès Sci. (Paris), M.D., C.M.
Assistant Electroencephalographer.....	PIERRE GLOOR, M.D. (Basle)
Electroencephalographic Fellows .....	FUAD HADDAD*, B.Sc., B.A., M.D. (Beirut) LEVER STEWART*, A.B. (Princeton) M.D. (Penn.)
Visiting Fellow.....	WILLIAM WILSON, B.S., M.D. (Duke)
Chief Technician and Demonstrator.....	R. CALDERON REYES* M.D. (Colombia) LEWIS HENDERSON

### *Experimental Neurochemistry*

Neurochemist and Donner Fellow.....	K. A. C. ELLIOTT, M.Sc., Ph.D., Sc.D.
Associate Neurochemist.....	HANNA M. PAPIUS, M.Sc., Ph.D. (McGill)
Fellows .....	JEAN D. CROSS, B.A. (Mount Holyoke) JAMES CROSSLAND*, M.A. (Oxon) Ph.D. (Wales)
	ERNST FLOREY, Ph. D. (Graz)
	HUGH MCLENNAN, M.Sc., Ph.D. (McGill)
	IRVING H. HELLER, M.D., M.Sc. (McGill)

### *Neuroanatomy and Medical Neuropathology*

Neuroanatomist and Neuropathologist .....	JERZY OLSZEWSKI, Ph.D., M.D.
Fellows .....	ELIZABETH FLOREY, Ph.D. (Graz) YOON BOM KIM, M.D. (Seoul, Korea) WANDA SCHIFFMAN* MICHEL VULPÉ, M.Sc. (McGill)

### *Neurophysiology*

Neurophysiologist .....	HERBERT JASPER, Ph. D., D.ès Sci. (Paris), M.D., C.M.
Fellows .....	L. M. M. LARRAMENDI, M.D. (Madrid) ROBERT NAQUET*, M.D. (Marseilles) FRANK MORELL, B.A., M.D. (Columbia) MARK RAYPORT*, B.A. (Earlham) M.D., C.M. (McGill)
Laboratory Supervisor.....	ALAN ROTHBALLER, M.D. (Penn.) MARY ROACH, R.N.

### *Photography*

Supervisor .....	JERZY OLSZEWSKI, Ph.D., M.D.
Photographer.....	CHARLES HODGE

### *Research in Multiple Sclerosis*

Chief .....	JAMES B. R. COSGROVE, M.D. (Man.) M.Sc. (Cantab.)
Chemist.....	PAMELA WEISS, B.Sc.

*Surgical Neuropathology*

<i>Neuropathologist</i> .....	WILLIAM CONE, B.S., M.D., F.R.C.S.(C), F.R.S.C.
<i>Assistant Neuropathologist</i> .....	ARMANDO ORTIZ, B.Sc. M.D. (Mexico)
<i>Neuropathological Fellow</i> .....	GILLES BERTRAND*, B.A., M.D. (Montreal) M.Sc. (McGill)
	EMIL BERGER*, M.D. (Vienna)
<i>Fellows</i> .....	EMIL BERGER* (Duggan Fellow) JOHN HUNTER, B.S., M.B. (Sydney) M.Sc. (McGill)
<i>Chief Technician</i> .....	JOHN GILBERT
*Six months on this service	

NURSING STAFF

<i>Director of Nursing</i> .....	MISS EILEEN C. FLANAGAN, B.A., R.N.
<i>Assistant Directors of Nursing</i> .....	MISS BERTHA CAMERON, R.N. MRS. ELEANOR CARMEN, R.N.
<i>Instructor</i> .....	MRS. CAROLINE TOSH, B.N., R.N.
<i>Supervisor Dressing Rooms</i> .....	MISS ANNIE JOHNSON, R.N.
<i>Night Supervisor</i> .....	MISS ELIZABETH BARROWMAN, R.N.
<i>Assistant Night Supervisors</i> .....	MISS LILLIAN MCAULEY, R.N. MISS BERNICE BROWN, R.N.
<i>Operating Room Supervisor</i> .....	MISS MARGARET HAGGART, R.N.
<i>Assistant Operating Room Supervisor</i> .....	MISS PHOEBE STANLEY, R.N.

HEAD NURSES

MISS M. CAVANAGH, R.N.	MISS ALICE CAMERON, R.N.
MISS EVA HAMMOND, R.N.	MISS LENORE KANE, R.N.
MISS CAROLINE ROBERTSON, R.N.	MISS IRENE MACMILLAN, R.N.
MISS KATHERINE AINGER, R.N.	

SOCIAL SERVICE STAFF

<i>Director</i> .....	MISS JOYCE BEATTIE, B.A., M.S.W.
<i>Social Workers</i> .....	MISS CYNTHIA BALCH, B.A., M.S.W. MISS BETTY FOLLIOTT, B.A., M.S.W. MRS. MARION GARMAISE, B.A., Dip. S.W. MISS KATHLEEN MACDONALD, B.A., B.S.W. MRS. GERINE PHILLS, B.A., M.S.W.

APPOINTMENTS HELD IN  
TEACHING HOSPITALS OF MONTREAL  
BY MEMBERS OF STAFF

ROYAL VICTORIA HOSPITAL

<i>Neurologist and Neurosurgeon-in-chief</i> .....	WILLIAM CONE
<i>Honorary Neurologist</i> .....	COLIN RUSSEL
<i>Neurologist</i> .....	FRANCIS McNAUGHTON
<i>Neurosurgeons</i> .....	WILDER PENFIELD THEODORE RASMUSSEN



*Back Row (left to right): Mrs. G. JOTIC, Misses J. YOUNIE, B. BALL, S. MIKKLESON, J. EMMS, M. CAVANAUGH,  
 Fourth Row: Mrs. P. PRIZANT, Misses K. BRAVAKON, M. L. SOUCISSE, J. LANTHIER, E. HOLDER, J. MARSH, R. CHOQUETTE,  
 Third Row: Misses S. O'HEIR, B. BROWN, P. HARRISON, R. ARASON, L. KANE, P. RATTRAY, M. LAROSE, N. SIDDON'S-GREY  
 Second Row: Mrs. E. HAMMOND, E. CARMAN, C. TOSH, Misses E. FLANAGAN, B. CAMERON, A. JOHNSON, A. CAMERON,  
 Front Row: Misses T. THOUIN, A. JOHNSON, D. MACDONALD, U. STORLE, E. ADAM, P. MURRAY, E. BAIN*

<i>Associate Neurologists</i> .....	PRESTON ROBB ARTHUR YOUNG
<i>Associate Neurosurgeon</i> .....	ARTHUR ELVIDGE
<i>Assistant Neurologist</i> .....	DONALD LLOYD-SMITH
<i>Clinical Assistants in Neurology</i> .....	J. B. R. COSGROVE R. RABINOVITCH
<i>Physician in charge of Electroencephalography and Electromyography</i> .....	HERBERT JASPER
<i>Assistant in Out-Door Clinics</i> .....	BERNARD GRAHAM

#### MONTREAL GENERAL HOSPITAL

<i>Neurosurgeon and Chairman</i> .....	HAROLD ELLIOTT
<i>Associate Neurologist and Director of EEG</i> .....	WILLIAM TATLOW
<i>Junior Assistant Neurologist</i> .....	BERNARD GRAHAM
<i>Consulting Neurosurgeons</i> .....	WILLIAM CONE ARTHUR ELVIDGE WILDER PENFIELD
<i>Consulting Neurologists</i> .....	FRANCIS MCNAUGHTON PRESTON ROBB
<i>Honorary Attending Staff</i> .....	NORMAN VINER
<i>Assistant Neurologist</i> .....	DAVID HOWELL

#### MONTREAL CHILDREN'S HOSPITAL

<i>Honorary Consultant</i> .....	COLIN RUSSEL
<i>Consultants</i> .....	WILLIAM CONE ARTHUR ELVIDGE DONALD McRAE WILDER PENFIELD FRANCIS MCNAUGHTON THEODORE RASMUSSEN
<i>Neurologists</i> .....	FRANCIS MCNAUGHTON PRESTON ROBB A. W. YOUNG

#### HÔTEL DIEU

<i>Chief of Neurological Service</i> .....	JEAN SAUCIER
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#### HÔPITAL NOTRE DAME

<i>Neurologist-in-Chief</i> .....	ROMA AMYOT
<i>In charge of Department of Neurosurgery</i> .....	CLAUDE BERTRAND

## REPORT OF THE NEUROLOGIST

DR. FRANCIS McNAUGHTON

In presenting the report of the Department of Neurology, I bring the record of a busy year of work by a capable and hardworking staff. As noted in last year's report, the number of Neurological admissions to the Institute has increased steadily since the opening of the McConnell Wing in 1953. In September last, two neurological services, of approximately twenty-five beds apiece, were set up, headed by Doctor Robb and by myself, each with its separate house staff, but under the supervision of one Neurological resident. This division of the clinical work has functioned well from all viewpoints, and we intend to continue it. The two services work closely together in friendly rivalry, and alternate in conducting teaching rounds throughout the year.

The arrangement whereby our assistant residents spend three months of their training year with Doctor Robb's service in Paediatric Neurology at the Montreal Children's Hospital is now well established. We feel that it is an important development in our Neurological training plan.

As in past years, we have received every three months an assistant-resident from the Department of Medicine in the Royal Victoria Hospital for clinical training. These three-month "visitors" have set a high standard in enthusiasm and hard work, and help to maintain a close bond with the Department of Medicine. The best praise I can offer this arrangement is to say that we hate to see each man leave us, when his period comes to an end. We welcome a similar rotation of assistant residents from the Department of Medicine at the Montreal General Hospital and look forward to the new link with another great hospital.

In undergraduate teaching a new plan was established this year with Professor J. S. L. Browne, whereby final year students do some case-reporting on our Neurological Wards. Doctor Heller, as Teaching Fellow, has supervised this work, and has transmitted some of his own enthusiasm to the students who took part. He has shown me that the post of Teaching Fellow is now an essential one.

The volume of consultation and outpatient work has remained about the same as last year. I wish to thank all the members of Staff — whom I need not name individually — who bear "the burden and heat of the day" in carrying out our many duties. We welcome Doctor Irving Heller who will join as junior staff member in January next.

We are proud to announce that the Seizure Clinic, a specialized Outpatient Clinic for the investigation and treatment of Epilepsy, has just received new financial support through a Federal-Provincial Grant of ten thousand dollars. This Grant will enable us to increase the Clinic Staff, and with the help of Miss Beatty and her Staff, to do more educational and rehabilitation work in the community on behalf of patients with this handicap.

With the help of the other special departments of the Institute, I feel that we are gradually building up a training centre for the teaching of Neurology in all its aspects, and this should be our continuing aim. At this point, I would like to

pay homage to Doctor Andrew T. Rasmussen, Emeritus Professor of Neuroanatomy at the University of Minnesota, and Visiting Professor at McGill — who has just completed for us a three month review course in Neuroanatomy. Professor Rasmussen brought to us a lifetime of teaching skill, and a youthful vigor and enthusiasm which made this course unique and unforgettable. I am certain that we will all be better neurologists because of his teaching.

In past reports I have stressed the need for the close integration of Neurology with Medicine and Psychiatry. There is particular need for a closer liaison with the Department of Psychiatry — from the standpoint of patient-care and interne training, as well as in the research field. I look forward to the day when we will have on our Staff one or more Psychiatrists who will tie us more closely to the Allan Memorial Institute, and the Department of Psychiatry at McGill.

Everywhere, people are encouraged by the good news of a vaccine which may make poliomyelitis a thing of the past.

Doctor Jasper's report to-day will outline some of the gradual advances in neurological research. Let us not forget the many chronic neurological diseases still unconquered and too numerous to mention, which form the greater part of our daily concern. To find the cause and cure of these diseases is the ultimate goal of Neurology.

## REPORT OF THE NEUROSURGEON

DR. WILLIAM CONE

At the time of the last annual meeting the McConnell Wing had been open for almost six months. The Department of Neurosurgery was delighted with it. It had become apparent how much more smoothly the services could function. The increased number of beds, the new operating room and the new dressing rooms made the difference. It seemed like another hospital; the tension and sense of urgency due to overcrowding was gone.

This year has been the first one with the McConnell Wing in full operation. Twelve hundred (1,200) patients were admitted to Neurosurgery. Eight hundred and thirteen (813) operations were done. One hundred and thirty four (134) patients who had sustained injuries to the central nervous system were admitted directly or secondarily referred here.

Toward the end of the year the demand for beds has increased. Now it is again necessary to put patients on the waiting list. The facilities are being used to the maximum. It will be necessary to enlarge the resident staff to care for patients. It is particularly important to plan the organization of the services so that scientific studies can be made hand in hand with the routine investigation and treatment of patients. Then in trying to alleviate distress through relief to individuals, we can still gather knowledge and facts which will be of enduring benefit.

It was announced at the last annual meeting that Dr. Theodore Rasmussen had resigned his post as Professor and head of the Neurosurgical Department at the University of Chicago and was returning to McGill to take the Chair of

Neurology and Neurosurgery and become a neurosurgeon to the Institute and the Royal Victoria Hospital. A third neurosurgical service was formed and he has taken charge of it. In the Outdoor Department each of the three services has its day when new patients are seen and old patients are followed. Now Dr. Penfield has a choice to make. He can treat his patients on either Dr. Elvidge's, Dr. Rasmussen's or Dr. Cone's service. We expect him to work harder! So far he has been admitting to Dr. Rasmussen's service and doing his operating on this service.

Professor E. G. D. Murray retires this year as Professor and head of the Department of Bacteriology at McGill. He has served as consultant bacteriologist to the Montreal Neurological Institute. Over the years his advice about aseptic technique and the management of infections has been invaluable. He leaves with our gratitude and sincere thanks and with our best wishes.

Last July Dr. John Hanbery left us to take over Neurosurgery at Leland Stanford in San Francisco. Now William Feindel is going to take charge of Neurosurgery at the University of Saskatchewan at Saskatoon. We are sorry to lose them. They are good companions, good investigators and well tried neurosurgeons. We wish them every success.

Dr. Lamar Roberts returned in January from a tour of duty in neurosurgery with the Navy of the United States. He is continuing his studies on cortical dominance and aphasia, and already is carrying a considerable clinical load in caring for patients and operating.

There are so many who have done so much to make this year a successful one. I must formally thank Dr. Penfield, Dr. Elvidge and Dr. Rasmussen for their cooperation. We are all particularly indebted to Dr. Joseph Stratford and Dr. Gilles Bertrand for their loyal efficiency in the senior residency. To the house staff, whom I will not name individually, thank you for the way you have supported the senior residents and the attending staff. Dr. McNaughton we thank, and the Department of Neurology, for a most interesting year of cooperative effort. Miss Flanagan, I express to you the thanks of the Neurosurgical Department to the entire nursing staff for kindly, efficient and skilled nursing, which is not excelled anywhere.

## REPORT OF HOSPITALIZATION

DR. PRESTON ROBB

In 1953 we welcomed the opening of the McConnell Wing, increasing occupancy up to 135 beds, and in 1954 we saw previous records broken. There were 2,145 patients admitted, an increase of 9.3% over the previous year. The total number of hospital days was 39,366; an increase of almost 24% over the preceding year. The average stay in hospital increased from 16.3 days in 1953 to 18.4 days in 1954. The death rate was 4.3% and the autopsy rate was 88%. The total number of surgical procedures was 813, a slight decrease from 1953 and a marked decrease from the maximum reached in 1951 when the number of operations was 1,029.

These figures in themselves do not mean very much other than an increased occupancy, which one would expect in the enlarged Institute. The fact is that we did not have enough patients to cover the cost of maintaining the whole operation. Already in 1955, to April 30, we have had 84 more patients and 1,977 more patients days than we had in a corresponding period in 1954. Unfortunately, we have not had a sufficiently high percentage of private and semi-private patients to cover the deficit incurred by the high percentage of public patients.

The Out-Patient Clinics continue to be active. In the Neurology Clinics there were 461 new patients seen and 3,000 re-visits. In the Neurosurgery Clinics there were 196 new patients and 626 re-visits. The total attendance was 4,283.

During the year two procedures formerly done by the Royal Victoria Hospital have been taken over by the Institute. First, the admission of patients: Under the supervision of Miss Flanagan the processing of all admission is carried out. The transition has gone smoothly and was integrated with the use of the addressograph plate. The second procedure is the completion of all forms and interviews related to deaths in the Institute. A manual of procedure has been prepared and Mr. Bain and his assistants now handle all these procedures with great tact and care.

The largest single item in our budget is for nursing and nursing aides. The number of unconscious, paralysed, post-operative and gravely ill patients in the Institute is high. These patients require total nursing care by specially trained nurses. For the most part this is provided by the Institute without the need for special duty nurses. This represents a great saving for the patient who would otherwise be required to pay for special nurses. At the same time it enables our nurses to work as a team. We recognize that the overall nursing cost is an expensive item; we make no apology for it. We are proud of our nurses and the leadership they have provided in Canada and elsewhere.

We are fortunate in having the services of Mr. Donald Bain who is directing the hospital accounts and finances. He has very successfully handled all building problems related to hospitalization. He has been able to maintain a very cordial relationship between the business office of the Royal Victoria Hospital and McGill. The Business Office is not without its problems. Careful study is being given to methods whereby we can continue to handle the increasing volume of work without increasing the staff or expenses.

The major problem during the year 1954-55 has been the increasing deficit. Based on the experience of the past several years, an estimation of occupancy was made for private, semi-private and ward patients. Unfortunately, this proved to be too optimistic for the first full year of operation of the enlarged Institute. As a result, there was a marked decrease in income. In spite of the fact that we have been able to decrease the cost per patient per day by 87 cents for the first ten months of this year as compared to a similar period during the previous year and the total expenditure is \$11,288.00 less than anticipated in the budget, we still have a considerable deficit for this ten-month period. We do not feel that further economic measures would effect any great saving without having an adverse effect on patient care. Further, we must anticipate increased cost due to increased wages and incomplete occupancy of the Royal Victoria Hospital which increases the pro rata percent of costs of services provided by them.



Considering the anticipated increased costs due to wages, etc. and present income, it is felt that the only way we could prevent a deficit for the year 1955-56 is to substantially increase our rates. Subject to approval, this will be done. At the same time, the campaign to economize will continue.

The Montreal Neurological Institute is a team project and one cannot praise any one person without omitting someone else who has played an important part in maintaining the morale and high standard of service to the patient. I am indebted to everyone for their help and co-operation.

## REPORT OF THE DIRECTOR OF NURSING

MISS EILEEN C. FLANAGAN

The nursing staff which now numbers approximately eighty graduates, eight undergraduates, and twenty-four nursing aides has been kept very busy during the year looking after an increasingly large number of patients, owing to a more rapid turnover. Our staff took care of an increase of 6,319 nursing days.

During the past year we have been conducting an analysis of our nursing load, including staffing and procedures, in order to be reasonably sure that we are giving the patients the necessary and proper care and that the time of the staff is being used as efficiently and economically as possible. Our general conclusions are that we are operating with a staff just sufficient to maintain the required standards, but which must be augmented with relief staff during periods of extra stress.

In 1953 we had 362 special nurses giving 3,823 nursing periods or 1,274 full days out of a total number of patient days of 31,876. In 1954 we had 521 special nurses giving 4,335 nursing periods or 1,445 full days out of a total number of patient days of 39,366.

The majority of the staff have taken the graduate course of teaching in the Institute, or have had experience and teaching during their undergraduate training, and the excellence of their work proves that it is neither economical nor satisfactory from a nursing point of view to have staff who are not specially prepared. This was demonstrated when we were obliged to increase the staff to cover the opening of the new wards, and for a time had to use nurses not specially prepared to nurse neurological patients.

Two classes of graduates of fifteen students each, have been given a six months course in neurological and neurosurgical nursing and seventy-two Royal Victoria students have each had six weeks experience and teaching.

I would like to point out again that the nursing Department needs a number of bursaries, or a reasonable endowment to finance this very necessary and important work of preparing nurses. Marriage makes great inroads each year, and we are kept busy maintaining our staff.

The Graduate's Society has been very active, with lectures and social meetings, and a bazaar which netted \$900.00 for their various projects.

We wish again to thank all the members of the medical staff for the unfailing interest, help and guidance they give to the nursing students and staff, which I think is reflected in the excellent care they in turn render to the patients, and the competent assistance they give to the doctors.

## SOCIAL SERVICE DEPARTMENT

MISS JOYCE BEATTY

The year's work of a social service department is not easily summed up in a few sentences but I will try to give some idea of what we have been doing during the past year.

We record the resignation of Miss Hidaka who had been a member of this department for seven years. Her contribution to the work of the hospital cannot be overestimated and I would like to express my own appreciation for the outstanding service she gave to patients and their families.

During the year we participated in the teaching program for post-graduate nurses, undergraduate nurses and social work students, and we have had a student from the McGill School for Social Work doing field work here during this past college year. The student, Miss Cynthia Balch who will graduate this year, is to come on staff as our new worker.

Emphasis should be given to an important part of our work — cooperation with other health and welfare organizations in the Community with the end in view of improving services to individuals and families. Two community problems that have been a source of great concern this past year are unemployment and the lack of facilities for the care of the chronically ill. When there is high unemployment it becomes extremely difficult for our handicapped people to obtain work. Too many of our patients are ready for work but unable to find jobs. Many of our chronically ill patients must remain in hospital much longer than is recommended, simply because there is no other place for them to go. This of course delays the admission of patients who need active treatment. We must continue to work with other agencies to try to find an answer to these two serious problems.

I would also like to acknowledge the help this Department has received from the Dominion-Provincial Grant for the study of the Social Problems of Epilepsy. Much progress has been made but we have never been able to resolve the problem of concentrating on research when patients' individual problems are so pressing. We are delighted that a new Dominion-Provincial Grant will enable us in cooperation with the Department of Neurology to give service to patients with seizures, undertake research and plan and carry out community projects.

We are very grateful to various individuals and groups who have given funds to be used in helping patients. I wish time permitted me to give some illustration of what this money has meant in terms of making life more comfortable and worthwhile for our patients.

Perhaps you have realized from what I have said, that our great emphasis in this department is in working with people. If I were to tell you that in 1954 the Social Service Department carried an average of 242 cases a month, some of you would be amazed at the number of patients known to us, others would feel that four workers should be able to handle more cases. It seems to me that in this annual report we should be able to translate these statistics in terms of human beings and what this Department has done to help our patients in obtaining the maximum benefit from medical care. Thus, case 56 becomes a man who was severely injured in an accident and requires not only expert medical and nursing care but sound rehabilitation and social planning.

Case 106 becomes a little blind girl, whose family will need help in planning for her schooling and in allowing her to lead as normal a life as possible.

Case 215 is an elderly man with a progressive neurological illness who can no longer care for himself and needs help in making some other plan.

Thus 242 cases become 242 human beings with social and/or emotional problems with which they must receive help if they are to benefit to the fullest extent from the excellent medical and nursing care in this Institute. To give this help has been and will continue to be the main function of the Social Service Department.

## DEPARTMENT OF ANAESTHESIA

DR. A. F. PASQUET

DR. R. G. B. GILBERT

DR. R. W. BETHUNE

Since the monumental changes which occurred when the McConnell wing was opened in 1953, work in the Department of Anaesthesia has gradually settled during the past year to a more normal routine. Most of our efforts and much of our time has been directed toward the improvement of our clinical work. New methods of anaesthesia have been evaluated and either put into general use or relegated to special cases, hypotension for neurosurgery being an example of the latter. Special studies relating to Largactil have been carried out and its use in conjunction with hypotension and hypothermia has been suggested. The development of special equipment has continued.

Toward the end of the year, clinical work gradually increased. This more satisfactory level has given some assurance that it will be possible to maintain the present staff.

General Anaesthetics	621
Spinal & Regional Anaesthetics	170
Total	791

There have been no changes in the personnel of the permanent staff. Dr. Bethune, however, previously an assistant has now become an associate member of our group. During the period covered by this report, four Residents from the Diploma Course in Anaesthesia of McGill University have studied in the

department. Teaching activities have continued. Drs. Pasquet and Gilbert have been promoted to the rank of Assistant Professor in the Department of Anaesthesia of McGill University. Dr. Gilbert has been appointed by the Royal College as the chairman of the examiners for Certification in Anaesthesia. An active part continues to be played in the management of the departments of anaesthesia of both the R.E.L.H. and the Q.M.V.H., by our group.

## DEPARTMENT OF RADIOLOGY

DR. DONALD McRAE

Radiology consists of the diagnosis and treatment of disease through the use of X-rays and radio-active substances. It is sometimes said that the practice of radiology is not a medical act. The diagnosis and treatment of disease is the practice of medicine whether it is done with the fluoroscope or the stethoscope, with the radium needle or the electric needle.

Neuro-radiology deals with the neurological or neurosurgical patient, not with his excretions or secretions or exhalations, but quite often with his exhortations. As the years go by, we deal with him more and more.

In 1935, 1,677 radiological examinations were carried out on 844 patients during 1,158 patient-visits. That was a rate of about one and one-half examinations per visit, and about two examinations per patient. In 1954, 8,111 radiological examinations were carried out during 4,926 patient-visits on approximately 2,100 different patients, almost two examinations per visit, and four examinations per patient. This increase is due to several factors. New techniques of radiological examination have been discovered. Old methods have been perfected and are therefore more valuable. Earlier investigation of disorders of the nervous system brings patients to us when diagnosis is more difficult and more examinations are required.

Included in the 8,111 examinations were 192 ventriculograms, 669 encephalograms, 372 myelograms, and 174 cerebral angiograms. The number of air studies and myelograms has been almost constant since 1946. The number of cerebral angiograms has increased steadily. They are our costliest, most time-consuming procedure. Special apparatus and automatic devices are necessary to obtain the standardized films in rapid succession which are necessary to best demonstrate angiomata and tumours. On the other hand, stereoscopic films are probably best for the localization of saccular aneurisms which seem so common today. Several different contrast media have been used in the past and two new ones are under investigation at the present time, but the ideal contrast material for angiography has not yet been discovered.

Dr. Sidney Traub as research fellow in neuroradiology made a retrospective study of all our cases of meningeal fibroblastoma. Dr. Hugh McLennan carried out an investigation of the uptake of radioactive sodium and potassium in the rat muscle at rest and after various stages of work.

The weekly neuroradiological colloquium was continued as were the bi-weekly case presentations with the department of Neurology. The neuro-radiology seminar has been transferred to the autumn so that the internes and fellows, most of whom come in July and August, will be better prepared for the case presentations.

The co-operation of the Medical Staff has been invaluable in the co-relation of the radiological findings with the patient's complaints, that is so necessary.

The help of the nursing staff has been invaluable in the handling of the complicated examinations and also in the care of our unconscious patients. It is always a pleasure to acknowledge this help and co-operation and to thank them formally.

## DEPARTMENT OF NEUROCHEMISTRY

DR. K. A. C. ELLIOTT

DR. HANNA PAPIUS

Every annual report, with the exception of one during the building programme, has recorded an increase in the work of this department. This trend continues. During 1954 the total number of procedures carried out was 14,554 or 17 per cent more than last year. Of these 6,093 were done in the 7th floor laboratory and 8,461 on the ward. Besides these procedures, 2,818 blood samples were taken for analyses here and in other laboratories, and 4,660 litres of irrigation solution for the operating rooms were prepared. At the turn of the year the pace increased considerably and the figures for 1955 seem likely to show a record increase.

Mrs. Lois Bota joined us as senior technician and Miss Brenda Hudson is now doing the ward work. The turnover of staff at a time of accelerating activity put considerable strain on the laboratory but, with praiseworthy diligence and sense of responsibility, Mrs. Bota and Miss Hudson have overcome the difficulties. Miss Catherine Dickey has now joined us with half her time allotted to the clinical laboratory and this arrangement takes care of rush periods, vacations and sickness.

Mrs. Bota has set up and tested a method for determining blood levels of chloramphenicol for application to a problem of Dr. Cone's. The method for sulfonamides has been modernised and we can now determine total as well as free sulfonamides. Determinations of creatine and creatinine, and porphyrin and porphobilinogen which were formerly done only on a research basis are now listed as regular services, as also are measurements of vital capacity.

## DONNER LABORATORY OF EXPERIMENTAL NEUROCHEMISTRY

DR. K. A. C. ELLIOTT

DR. HANNA PAPIUS

The past year has been one of the liveliest that this department has known. The new laboratories have proved to be very convenient and pleasant to work

in and maximum use has been made of their facilities. The investigations carried out are aimed at discovering the basic processes by which nervous tissue is maintained and exerts its functions and the manner in which these can be affected by metabolic and other factors. Abnormal conditions which may occur in the brain *in situ* are mimicked in the controlled laboratory situation and their effects studied. Techniques, worked out on tissue from experimental animals, are applied to human biopsy material, when feasible, in order to detect chronic biochemical abnormalities. Fellows who wish to work on more directly clinical problems are always welcome and space is kept available for such work and for fellows from other departments whose work requires chemical facilities. This year, for instance, Dr. Heller in collaboration with Dr. Feindel and Dr. J. C. Beck has started a study of electrolyte and water balance following neurosurgical operations, and Dr. Wilson has used the facilities of the laboratory in his studies on hyperventilation and the electroencephalogram.

Results obtained by Dr. Irving Heller allow us to conclude that the metabolic activity of cerebral cortex is mainly due to neurons in spite of the preponderance of glial elements. The small neurons of the cerebellar cortex, however, are less active than glial cells. His work with gliomas suggests that normal oligodendroglia are metabolically much more active than astrocytes. The metabolic activity of most gliomas is low, like that of white matter.

Since his arrival in April 1954, Dr. Ernst Florey has confirmed his previous discovery of an inhibitory neurohumoral factor. He calls this factor "Substance I" and he has considerably improved the method of preparation from brain. Dr. Hugh McLennan, after completing a study of the movements of potassium in mammalian muscle, has studied the actions of Substance I in the mammalian nervous system in collaboration with Dr. Florey. They have shown that this factor is present in normal brain *in vivo* and that it is active at various peripheral and central synapses. Recently Mr. Gerhardt Fink has joined the group and helps to expedite this work.

Miss Jean Cross has shown that the damage which deprivation of glucose and oxygen causes to the metabolic activity of brain, particularly the glycolytic mechanism, can be decreased or prevented by lowered temperature. She has also shown that the glycolytic activity is remarkably sensitive to stimuli of metabolic origin.

Dr. James Crossland, of the University of St. Andrews, visited the laboratory for a few months. In a whirlwind of activity he discovered, with Dr. Pappius, the interesting and unexpected reason for a discrepancy between his former work and work from this laboratory, proved that the method of freezing the brain *in situ* with liquid air is valid and necessary for the determination of the acetylcholine content of brain under various physiological conditions, demonstrated this further by showing an effect of insulin hypoglycemia on brain acetylcholine which had been missed by others, introduced new techniques into this and other local laboratories, as well as making innumerable friends.

Besides her work with Dr. Crossland, Dr. Hanna Pappius has continued a study of the effects of conditions on brain swelling, intra- and extracellular spaces and electrolyte content. Among other things she has found that the considerable

swelling which brain tissue undergoes is due to water increase in a compartment which is not intracellular and even, apparently, separate from the ordinary extracellular tissue fluid.

The long-delayed book on Neurochemistry has been indexed and it should appear in the immediate future.

## DEPARTMENT OF ELECTROENCEPHALOGRAPHY

HERBERT H. JASPER

The work of this department has proceeded at about the usual rate during the past year, though there has been some decline in the number of patients examined. There were 2,195 examinations carried out on 1,860 patients. As in previous years about one-half of these were patients with epilepsy. There were 43 electrocorticograms taken during neurosurgical treatment of epileptic patients.

Our laboratories continue to be a training center for E.E.G. technicians and electroencephalographers. Since the opening of these laboratories in the fall of 1938 we have trained 42 technicians with an additional 7 who have come for a brief period of observation (up to 3 months). During this same period we have trained 71 electroencephalographers with an additional 8 who have been with us for a shorter period of time. Practical training is given by Mr. Lewis Henderson, with the aid of Miss Lilli Prisko. Experience in interpretation is available in daily sessions of reporting.

We are pleased to announce that Dr. Peter Gloor has returned from Switzerland to become assistant electroencephalographer in this department.

## DEPARTMENT OF NEUROPHYSIOLOGY

HERBERT H. JASPER

Research has continued in this department\*; using the electrical activity and response of the brain to elucidate the functional properties of the cerebral cortex in relation to the older parts of the brain in diencephalon and brain stem. This has included studies of the temporal lobe in relation to the adjacent rhinencephalic structures, which are of such importance in patients with epileptic seizures arising in the temporal region.

We regret the departure of Dr. Choh-Luh Li, who was doing brilliant work with the microelectrode analysis of cortical activity. We congratulate him, however, for the excellent opportunities he has to continue his work in the new United States Public Health Institute in Bethesda, Maryland, where he is associated with several other M.N.I. Fellows working together there.

There were seven neurophysiology fellows during the past year: Drs. Rothballer, Larramendi, Rayport, Sharpless, Morell, Naquet and Gloor. They were all working on separate but closely interrelated problems. There were nine fellows from other departments who carried out some of their work in these

\*See report on Graduate Studies and Research

laboratories. There were a total of 253 major operative procedures carried out, and 296 minor ones, all ably managed with the help of Miss Roach and her staff.

Mention should be made also of special research conducted by Drs. Jasper, Naquet and King in the laboratories of Professor Magoun in California during the summer, which resulted in the amicable settlement of a controversial issue of considerable importance to our understanding of the functional significance of the non-specific thalamic reticular system in the regulation of cortical activity.

Finally, we would like to express our appreciation to the Bronfman family, whose continued support has done much to make possible the work of this department. Dr. Robert Martin has just been appointed Bronfman Fellow in Neurophysiology for the coming year.

We wish to acknowledge also the Federal-Provincial Research Grant, renewed for a second year through the support of Dr. Jean Grégoire for the project on microelectrode analysis of mechanisms of epileptic discharge in the brain. Drs. Rayport and Gloor are continuing the work begun with Drs. McLennan and Li with this new technique. We hope soon to be able to listen in on the discharge of single cells in the human brain.

## DEPARTMENT OF NEUROANATOMY AND NEUROLOGICAL PATHOLOGY

DR. FRANCIS MCNAUGHTON

DR. JERZY OLSZEWSKI

We were very fortunate in having Dr. A. T. Rasmussen, visiting Professor of McGill University, to conduct a post-graduate refresher course in Neuroanatomy during the months of February, March and April, which was deeply appreciated by all participants. Dr. Rasmussen left a valuable collection of dissections which will serve as teaching material for many years to come.

The relations of the Department to the Pathological Institute have been reorganized. Dr. Olszewski has been appointed part-time staff member of the Pathological Institute of McGill University, and is now taking care of all neuropathological material of this Institute, in addition to medical neuropathological material of M.N.I. We acknowledge with thanks the co-operation of the staff of the Autopsy section of the Pathological Institute, who made our work pleasant, interesting and rewarding.

Weekly demonstrations of neuropathological material have been started, and it is hoped that enough interest will be shown by the Fellows and house staff to continue this practice next year.

Due to the reorganization of the Department, and to work received from the Department of Neurophysiology, the vastly increased amount of routine histological work has necessitated an increase in technical staff.

Dr. Y. B. Kim has helped with the routine pathological material, and conducted a study of the anomalies of the blood vessels in the newborn, with special



reference to congenital aneurysms. Dr. Elizabeth Florey has been working on the problem of the complement fixing antibodies against brain in relation to allergic encephalitis. Mr. Michel Vulpé, a postgraduate Ph.D. student, has studied lipase activity in experimental allergic encephalitis. These projects have been conducted under a grant from the Multiple Sclerosis Society of Canada. Dr. W. Schiffman from St. Justine Hospital has participated as a part-time observer in the activities of the Department. A "Lederle" studentship was held by Mr. John Sheahan, third year medical student during July and August, and Mr. Peter Macklem, also from third year medicine, held the departmental student summer fellowship during the same period. Mr. Henry Dinsdale from Kingston University spent the summer in the Department as a visiting student. Mr. A. Renton, Mr. E. Keller and Mr. H. Watson of McGill University held studentships under a special grant from the Department of Health of the Province of Quebec.

It should be mentioned finally that the newly organized co-operation between the Pathological Institute and our Department may be the starting point of an endeavour to create a financially independent laboratory of experimental neuropathology. Some preliminary discussions have been held on this subject and the idea will be pursued in the next year.

## PHOTOGRAPHY

DR. JERZY OLSZEWSKI

The Department is now firmly settled in its new quarters and due to enlarged space and other facilities work is both easier and more satisfactory. Most of the orders are of the same type as in previous years, but the demand for color photography has increased considerably. A great number of large color transparencies for the sixth floor museum and certain exhibitions have been made.

This year Mr. Hodge again attended the Convention of the Biological Photographers, and returned with the second prize in clinical photography and six honorable mentions.

Mr. Hodge also won the trophy for the best scientific photograph in the salon of the Professional Photographers of the Province of Quebec.

Mr. John Gunn has replaced Mr. Ronald Haram as assistant in this department, and is performing his duties in an able manner.

## THE FELLOWS' LIBRARY

DR. DONALD LLOYD-SMITH

The library has grown in the past year with the addition of a large reading room made possible by alterations secondary to the opening of the New McConnell Wing. More shelf space, which was urgently required, has made possible re-organization of the library and the addition of many books recently published. Direction and supervision of small units of the library in the Departments of Neurochemistry, Neuroanatomy, and Neuroradiology have been continued.

The library has been signally honoured to receive contributions of more than sixty books of great historical and academic interest from the library of Dr. Wilder Penfield.

## THE MONTREAL NEUROLOGICAL SOCIETY

1954-55

Chairman:.....	DR. CLAUDE BERTRAND
Vice-Chairman:.....	DR. K. A. C. ELLIOTT
Secretary-Treasurer:.....	DR. WILLIAM FEINDEL

Twenty-nine meetings of the Section of Neurology of the Montreal Medical-Chirurgical Society were held weekly from October 6th to May 13th.

In addition to bi-monthly clinical meetings held at Notre Dame Hospital, Hotel Dieu, Montreal General Hospital, and the Montreal Neurological Institute, there were meetings addressed by distinguished visitors and local colleagues. It was of historical interest that the meeting of March 2nd was the last meeting of the Society to be held in the old Montreal General Hospital. A number of distinguished visitors came from overseas, as well as from the United States. The variety and excellence of the presentations provided a considerable stimulus to the clinical and research staff of the Institute. The papers read before the Society were as follows:

- PROFESSOR CARL SCHMIDT, University of Pennsylvania, "Cerebral Circulation."
- DR. IRVING HELLER, The Montreal Neurological Institute, "Chemical Studies of Brain Tumors."
- DR. CHURCHILL-DAVIDSON, St. Thomas' Hospital, London, England "Neuromuscular Transmission in Myasthenia Gravis."
- DR. GILBERT HORRAX, the Lahey Clinic, Boston, Mass., "Changing Methods in the Treatment of Pituitary Tumors."
- PROFESSOR HENRY BARCROFT, St. Thomas' Hospital, London, Eng., "Nervous Control of the Blood Vessels of the Limbs."
- DR. ERNST FLOREY, The Montreal Neurological Institute, "Inhibitory Factors of Normal Brain: Its Anti-Excitatory and Anti-Convulsive Action."
- DR. H. E. MCHUGH, Department of Oto-Laryngology, The Royal Victoria Hospital, Montreal, "The Evaluation of Hearing in Pre-School Children Who Lack Normal Speech."
- DR. T. B. RASMUSSEN, The Montreal Neurological Institute, "Mid-Line Cervical Disk Protrusion: Observations on Diagnosis and Surgical Treatment."
- DR. I. M. TARLOV, Department of Neurology and Neurosurgery, New York Medical College, "Studies on Spinal Cord Compression."
- DR. LLOYD G. STEVENSON, McGill Medical Library, Montreal, "Historical Review of the Work of David Ferrier on Cerebral Localization."
- DR. E. H. BOTTERELL, Department of Neurosurgery, Toronto General Hospital, "The Surgical Treatment of Intracranial Aneurysms with Hypothermia."

- DR. ALEXANDER GEIGER, Neuro-Psychiatric Institute, University of Illinois, "Some Aspects of Brain Metabolism 'At Rest' and During Activity."
- PROFESSOR H. KRAYENBÜHL, University Neurological Clinic, Zürich, Switzerland, "Cerebral Thrombosis and Thrombo-Phlebitis. The Diagnostic Value of Cerebral Phlebography and the Value of Neurosurgical Treatment."
- DR. KARL PRIBRAM, Research Laboratories, Institute of Living, Hartford, Conn., "Temporal Lobe Studies in Primates."
- DR. STEPHEN KUFFLER, Wilmer Institute, Johns Hopkins Hospital, Baltimore, Md., "Posture Control."
- PROFESSOR P. MASSON, University of Montreal, "La Conformation des Meningiomes."
- PROFESSOR A. T. RASMUSSEN, Emeritus Professor of Anatomy, University of Minnesota, "The Cerebral Cortex" (Annual Neuroanatomy Lecture).
- PROFESSOR NORMAN DOTT, The Royal Infirmary, Edinburgh, Scotland, "The Common Features in Brain Displacement, by Tumor, by Haemorrhage and by Violence" (Annual Hughlings Jackson Memorial Lecture).

The officers elected for the following year are:

*Chairman*, DR. T. B. RASMUSSEN  
*Vice-Chairman*, DR. W. F. T. TATLOW  
*Secretary-Treasurer*, DR. J. B. R. COSGROVE

#### THE FELLOWS' SOCIETY

DR. A. B. ROTHBALLER, *President*  
 DR. GILLES BERTRAND, *Vice-President*  
 DR. MARK RAYPORT, *Secretary*

This year the Fellows' Society comprised 43 members representing 14 different nationalities. The year's program began with a meeting at Dr. Robb's house to introduce new Fellows and outline the coming season's activities. A journal discussion group was set up under Dr. Mullan's guidance, and arrangements were made, along with a group of MNI nurses and technicians, to rent a ski hut for the winter.

Two combined social meetings with the MNI Wives' Club were held during the winter, with Dr. Elvidge and Dr. Penfield as speakers. Daily afternoon tea was established in the Reford room and was well attended by Fellows and staff alike.

The scientific program featured a number of speakers, many of whom were guests of the Montreal Neurological Society, and included: Dr. Carl Schmidt, Prof. C. Q. Bernhard, Dr. H. C. Churchill-Davidson, Dr. G. Horrax, Dr. Desmond Pond, Dr. H. Barcroft, Dr. I. M. Tarlov, Dr. H. E. Botterell, Dr. A. Geiger, Dr. S. W. Kuffler, Prof. H. Krayenbühl, Mr. Derwyn Severy, Prof. Norman Dott, Dr. R. Garrity, Lord Adrian, Dr. David Cogan, Prof. O. L. Zangwill, Mr. M. Falconer, Dr. S. L. Sherwood.

## CLINICAL APPOINTMENTS AND FELLOWSHIPS\*

Appointments to the Resident Staff in Neurology or Neurosurgery are made for July 1st or January 1st. All candidates are expected to have had previous internships in Medicine or Surgery.

The posts of Senior Resident in Neurosurgery, Resident in Neurosurgery and Resident in Neurology are available only to men who have had previous clinical service in the Institute.

Assistant Resident in Neurosurgery — one year's duration — available January 1st and July 1st.

Assistant Resident in Neurology — six to twelve months' duration — available January 1st and July 1st.

Appointments for periods of research and training in one of the laboratories are made by the Director and the Chief of the laboratory in question. It is a general rule that no research stipends are available to a graduate student during his first year of research unless he is appointed to one of the following fellowships: Senior Fellowship in Neuropathology — twelve months' duration — available July 1st.

Junior Fellowship in Neuropathology — six months' duration — available July 1st and January 1st.

Senior Fellowship in Clinical Electroencephalography — six months' duration — available January 1st and July 1st.

Fellowship in Neuroanatomy — six months' duration — available January 1st and July 1st.

The Diploma in Neurosurgery, McGill University, requires at least four years of study, including periods of investigative work and neurology.

The Diploma in Neurology, McGill University, requires at least four years of study, including periods of investigative work, neurosurgery and psychiatry.

Applicants for clinical services are preferred who have a speaking knowledge of the French language.

\*Graduate physicians or surgeons who wish to be enrolled in clinical or scientific work as something more than an observer must fill out application forms obtainable from the Director's office and provide names of reference.

## COURSES OF INSTRUCTIONS

### UNDERGRADUATE

The Department of Neurology and Neurosurgery cooperates intimately with the Departments of Medicine, Surgery, Pathology, and Radiology in their undergraduate teaching. Thus the teaching of neurology, neurosurgery, neuropathology, and neurological radiology is carried out as part of the regular course planned by the Chairman of each of the above departments.

## GRADUATE

In the Faculty of Graduate Studies and Research, courses are offered leading to the degrees of Master of Science and Doctor of Philosophy. Throughout the year, the following elective courses are given for graduate students, Fellows and members of the house staff, and are open to undergraduates by arrangement.

\*A. SEMINAR IN NEUROLOGY.

1. Lectures, demonstrations, and discussions, correlated with Course B.  
Professor McNaughton  
Professor Olszewski
2. Advanced neuroanatomy for selected group.  
Professor McNaughton

\*B. SEMINAR IN NEUROPHYSIOLOGY.

1. Lectures and examination together with undergraduate course, "Anatomy and Physiology of the Central Nervous System".
2. Weekly graduate seminars and demonstrations coordinated with Course A.  
Professor Jasper

C. COLLOQUIUM IN CLINICAL NEUROLOGY. 1 hour weekly, clinics and lectures.  
Staff and Visiting Lecturers

D. SEIZURE MECHANISMS AND CEREBRAL LOCALIZATION: Neurosurgical, Electroencephalographic and Roentgenographic Conference. 2 hours weekly.  
Professor Penfield  
Professor Rasmussen  
Professor McNaughton  
Professor McRae

E. CONFERENCE IN NEUROSURGICAL PATHOLOGY. Gross and microscopic demonstrations to be supplemented by collateral work.  
Professor Cone

\*F. OUTLINE OF NEUROCHEMISTRY. Lectures and demonstrations.  
Professor Elliott

\*G. DEMONSTRATIONS IN MEDICAL NEUROPATHOLOGY.  
Professor Olszewski

H. SEMINAR IN NEUROLOGICAL RADIOLOGY.

1. Didactic lectures.
2. Colloquium.  
Professor McRae

\*Acceptable for credits for M.Sc. and Ph.D.

## DONATIONS

### TO HARVEY CUSHING CLINICAL RELIEF FUND:

Mrs. H. Y. Russel .....	\$ 10.00
Miss Suzanne Cohen .....	25.00
Dr. Francis McNaughton .....	400.00

### TO THE HOBART ANDERDON SPRINGLE MEMORIAL FUND:

Mrs. H. A. Springle .....	1,750.00
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### TO MCNAUGHTON NEUROANATOMY RESEARCH FUND:

Mr. Harold Crabtree .....	3,000.00
Frank W. Horner, Ltd. ....	300.00

### TO NEUROMUSCULAR RESEARCH FUND:

Mrs. Louis Scott Deitz .....	1,000.00
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### TO DICK FUND:

Anonymous .....	1,000.00
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### TO M.N.I. MASONIC INSTRUMENT RESEARCH FUND:

St. George's Lodge No. 10, A.F. & A.M. ....	1,000.00
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### TO CANCER CLINICAL RELIEF FUND:

Cancer Aid League .....	2,100.00
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### TO MISCELLANEOUS SPECIAL FUNDS:

Mr. Fred Brown .....	5,000.00
Ciba Company — for Dr. Florey's research .....	500.00
Quebec North Shore Paper Company .....	1,000.00

### TO CONE RESEARCH FUND:

Mr. and Mrs. Josef Aron .....	50.00
Mr. Harold Crabtree .....	3,000.00
Mr. Alfred Felson .....	50.00
Mr. Gordon Gowling .....	200.00
Mr. K. B. Jenckes .....	50.00
Dr. Samuel Leslie .....	25.00
Mr. Joseph Schumer .....	500.00
Mr. Sam Smoller .....	100.00
Mrs. Sam Smoller .....	100.00
Mrs. Mollie Strauss .....	525.00
Mr. Jacob Strauss .....	500.00
Mrs. Harry Thorp .....	500.00

## PUBLICATIONS

1954-55

### GORDON DUGGER:

*Necrosis of the Brain Following Roentgen Irradiation.* Am. J. Roentgenol. 72: 953-960, 1954. (with J. G. Stratford and J. Bouchard).

See F. S. Haddad, joint author.

See John Hanbery, joint author.

See Alan Rothballer, joint author.

See Roy Swank, joint author.

### K. A. C. ELLIOTT:

*Tissue Slice Technique*, in *Methods of Enzymology*, by S. D. Colowick and N. O. Kaplan. New York, Academic Press, 1.3.9, 1955.

See Irving Heller, joint author.

See Hanna Pappius, joint author.

### ARTHUR ELVIDGE:

*Neurosurgery.* Chapter in book, *Textbook of Surgery*, 2nd Edition, p. 222-293, St. Louis, C. V. Mosby, 1955.

### WILLIAM FEINDEL:

*Anatomical Overlap of Motor Units.* J. Comp. Neurol. 101: 1-18, 1954.

*Surgical Treatment of Involuntary Movements.* Chapter for book, *British Surgical Practice*, p. 55-66, London, Butterworth, 1954.

*Comparison of Electrographic Effects of Stimulation of the Amygdala and Brain Stem Reticular Formation in Cats.* E.E.G. Clin. Neurophysiol. 6: 389-402, 1954. (with Pierre Gloor).

*Localization of Discharge in Temporal Lobe Automatism.* A.M.A. Arch. Neurol. & Psychiat. 72: 605-630, 1954. (with W. Penfield).

### ERNST FLOREY:

*Die Wirkung des Hemmungsfaktors aus Gehirn und Rückenmark auf periphere und zentrale synaptische Übertragung.* Naturwissenschaften, 42: 51-52, 1955. (with Hugh McLennan).

### R. G. B. GILBERT:

*Conservative Therapy of Peripheral Vascular Diseases with the Use of Largactil.* Treatment Services Bulletin, 9: 324-342, 1954. (with A. B. Dobkin and L. Lamoureux).

*Physiological Effects of Chlorpormazine.* Anesthesia, 9: 157-174, 1954. (with L. Lamoureux).

*Some Studies with Largactil.* Canad. M.A.J. 70: 626-628, 1954. (with A. B. Dobkin and L. Lamoureux).

### PIERRE GLOOR:

*Autonomic Functions of the Diencephalon.* A.M.A. Arch. Neurol. & Psychiat. 71: 773-790, 1954.

See William Feindel, joint author.

### FUAD HADDAD:

*Metastatic Dysgerminoma of the Central Nervous System.* J. Neuropath. & Exper. Neurol. 13: 455-461, 1954. (with G. S. Dugger).

JOHN HANBERY:

*Perithelial Sarcoma of the Brain.* A.M.A. Arch. Neurol. & Psychiat. 71: 732-761, 1954. (with G. S. Dugger).

IRVING HELLER:

*Desoxyribonucleic Acid Content and Cell Density in Brain and Human Brain Tumors.* Canad. J. Biochem. & Physiol. 32: 584-592, 1954. (with K. A. C. Elliott).

*Hereditary Sensory Neuropathy.* Neurology, 5: 15-29, 1955. (with Preston Robb).

JOHN HUNTER:

*Pathways Mediating Metrazol Induced Irradiation of Visual Impulses.* E.E.G. Clin. Neurophysiol. 7: 39-60, 1955. (with David Ingvar).

HERBERT JASPER:

*Functional Properties of the Thalamic Reticular System.* Chapter in Brain Mechanisms and Consciousness: A Symposium. p. 374-401, edited by E. D. Adrian, F. Bremer and H. Jasper. Oxford, Blackwell Scientific Publications, 1954.

*A Stereotaxic Atlas of the Diencephalon of the Cat.* Ottawa, The National Research Council of Canada, 1954. (with Cosimo Ajmone-Marsan).

*Diagnostic Methods: II. Electroencephalography and Electrophysiologic Methods.* Chapter for book, Clinical Neurology, p. 201-228. New York, Paul B. Hoeber, 1955. (with D. Daly).

*Thalamocortical Recruiting Responses in Sensory Receiving Areas in the Cat.* E.E.G. Clin. Neurophysiol. 7: 99-114, 1955. (with R. Naquet and E. E. King).

*Interrelationship Between Cortex and Subcortical Structures: Clinical Electroencephalographic Studies.* Third International Congress of Electroencephalography and Clinical Neurophysiology, Supplement No. 4, p. 168-188, 1953. (with John Van Buren).

SHAFICA KARAGULLA:

*Psychical Phenomena in Temporal Lobe Epilepsy.* Brit. M. J. 1: 748-752, 1955. (with E. Robertson).

HUGH MCLENNAN:

*The Transfer of Potassium Between Mammalian Muscle and the Surrounding Medium.* Biochemica et Biophysica Acta. 16: 87-95, 1955.

See Ernst Florey, joint author.

HANNA PAPIUS:

*The Hydrolysis of Adenosine Triphosphate by Brain Suspensions.* Canad. J. Biochem. & Physiol. 32: 471-483, 1954. (with K. A. C. Elliott).

*Adenosine Triphosphatase Electrolytes and Oxygen Uptake Rates of Human Normal and Epileptogenic Cerebral Cortex.* Canad. J. Biochem. & Physiol. 32: 434-490, 1954. (with K. A. C. Elliott).

ANDRÉ PASQUET:

*Combined Regional and General Anesthesia for Craniotomy and Cortical Exploration. Part II. Anesthetic Considerations.* Current Researches in Anesth. & Analg. 33: 156-164, 1954.



WILDER PENFIELD:

- Some Observations on Amnesia.* Am. J. Psychiat. 110: 834, 1954.
- Studies of the Cerebral Cortex of Man: A Review and an Interpretation.* Chapter in *Brain Mechanisms and Consciousness: A Symposium*, p. 284-305, edited by E. D. Adrian, F. Bremer, and H. Jasper. Oxford, Blackwell Scientific Publications, 1954.
- Combined Regional and General Anesthesia for Craniotomy and Cortical Exploration. Part I. Neurosurgical Considerations.* Current Researches in Anesth. & Analg. 33: 145-155, 1954.
- Some Observations on the Functional Organization of the Human Brain.* Proc. Am. Philos. Soc. 98: 293-297, 1954.
- The Results of Surgical Therapy for Focal Epileptic Seizures.* Proc. V International Neurological Congress, p. 251-258, 1953. (with K. W. E. Paine).
- See William Feindel, joint author.

THEODORE RASMUSSEN:

- Diagnostic Problems in the Hydrocephalic Infant.* Nebraska M.J. 39: 244-247, 1954.
- Effects of Altering the Parameters of Electrical Stimulating Currents Upon Motor Responses from the Precentral Gyrus of Macacca Mulatta.* Brain, 77: 18-33, 1954. (with Charles Cure).
- The Use of Beta Ray Point Source for Destruction of Hypophysis.* Surgical Forum, American College of Surgeons. p. 681-686, 1953. (with P. Harper and T. Kennedy).
- Occlusion of the Middle Cerebral Artery Under Normotension, Anaemically-induced and Chemically-induced Hypotension.* J. Neurosurg. 12: 26-33, 1955. (with B. Ralston and T. Kennedy).
- Neuropathy, Cardiopathy, Hemosiderosis and Testicular Atrophy in a Gorilla Gorilla.* A.M.A. Arch. Path. 59: 5-25, 1955. (with P. Steiner and L. E. Fisher).

PRESTON ROBB:

See Irving Heller, joint author.

JOHN ROTH:

See Roy Swank, joint author.

ALAN ROTHBALLER:

*Hypothalamic Tumor: A Correlation of the Symptomatology with Alterations in the Regional Anatomy and Neurosecretion.* Neurology, 5: 160-176, 1955. (with G. S. Dugger).

JOSEPH STRATFORD:

See Gordon Dugger, joint author.

ROY SWANK:

- Fat Embolism: A Clinical and Experimental Study of Mechanisms Involved.* Surg., Gynec. & Obst. 98: 641-652, 1954. (with G. S. Dugger).
- Chylomicron and Clearing Reaction: Effect of Heat and of Refrigeration.* Proc. Soc. Exper. Biol. & Med. 86: 74-77, 1954. (with Esther Roth).
- Apparatus for Measuring Relative Blood Viscosity.* Rev. Scient. Instruments. 25: 1020-1022, 1954. (with John Roth).

DONALD TOWER:

*Structural and Functional Organization of Mammalian Cerebral Cortex: The Correlation of Neurone Density with Brain Size.* J. Comp. Neurol. 101: 19-51, 1954.

## CLASSIFICATION OF DISEASES

### *Nervous System Generally:*

Neurosyphilis .....	8
Multiple sclerosis .....	63
Motor neurone disease .....	12
Myasthenia gravis .....	4
Miscellaneous .....	30

### *Meninges:*

Meningocele and myelomeningocele .....	14
Acute purulent meningitis .....	12
Tuberculous meningitis .....	6
Headache .....	38
Subdural haematoma .....	8
Subdural hygroma .....	4
Epidural haematoma .....	1
Miscellaneous .....	10

### *Brain:*

Congenital anomalies .....	10
Hydrocephalus .....	35
Brain abscess .....	6
Cerebral concussion .....	69
Cerebral contusion, laceration, traumatic encephalopathy .....	42
Epilepsy .....	376
Migraine .....	23
Cerebral thrombosis, encephalopathy, due to arteriosclerosis .....	99
Cerebral haemorrhage .....	13
Cerebral embolism .....	3
Intracranial aneurysm .....	26
Miscellaneous .....	42

### *Tumours:*

Glioma .....	94
Perineurial fibroblastoma .....	6
Meningeal fibroblastoma .....	25
Pituitary adenoma .....	13
Craniopharyngioma .....	3
Haemangioma .....	10
Miscellaneous of CNS and skull .....	25
Secondary tumour, brain and spinal cord .....	29
Miscellaneous tumors, body generally .....	14

### *Spinal Cord:*

Compression of spinal cord .....	6
Acute myelitis .....	2
Acute anterior poliomyelitis .....	4
Guillain Barré syndrome .....	5
Myelopathy, undetermined origin .....	17
Syringomyelia .....	8
Miscellaneous .....	7

*Cranial and Peripheral Nerves:*

Optic neuritis .....	7
Trigeminal neuralgia .....	41
Bell's palsy .....	9
Meniere's syndrome .....	18
Cervical rib syndrome .....	1
Traumatic peripheral nerve lesions .....	15
Other neuralgias .....	8
Peripheral neuropathy .....	12
Miscellaneous .....	28

*Mental Diseases:*

Mental deficiency .....	13
Schizophrenia .....	5
Depression .....	13
Drug addiction .....	2
Psychoneurosis .....	63

*Other Systems:*

Occipitalization of atlas .....	2
Congenital anomalies of spine .....	8
Congenital anomalies of skull .....	3
Herniation of intervertebral disc., cervical .....	26
thoracic .....	3
lumbar .....	152
Skull defect, post-operative .....	1
Fracture and/or dislocation of vertebral column .....	32
Spondylolisthesis .....	5
Fracture, skull .....	119
Back pain .....	77
Intractable pain .....	9
Other peripheral pain .....	19
Essential hypertension .....	7
Traumatic lesion, soft tissues .....	9
Muscular dystrophy .....	2
Infections .....	7
Miscellaneous .....	56

## CLASSIFICATION OF OPERATIONS

Craniotomy	2
Hemispherectomy	2
and Biopsy	2
and Decompression	7
and Drainage of Abscess	19
and Drainage of Subdural Hematoma	5
and Drainage of Intracerebral Hematoma	3
and Drainage of Extradural Hematoma	13
and Excision of Epileptogenic Focus	5
and Excision of Focal Area of Brain	1
and Excision of Aneurysm	8
and Exploration	5
and Hypophysectomy	2
and Incision and Drainage of Cyst	7
and Obliteration of Aneurysm	3
and Obliteration of Cyst	2
and Plastic Repair of Dura	3
and Plastic Repair of Skull	91
and Removal of Tumor	9
and Rhizotomy	1
and Lobotomy	21
and Lobectomy	19
Trepanations or Craniocentesis	10
and Biopsy	5
and Drainage of Subdural Space	2
and Drainage of Abscess	8
and Ventriculography	23
Elevation of Depressed Skull Fracture	3
Plastic Repair of Skull Defect, Tantalum	5
Plastic Repair of Skull Defect, Bone	4
Suture of Lacerated Wound and Scalp	7
Ventriculocisternostomy (Torkildsen's)	1
Catheterization of Sylvian Aqueduct	9
Laminectomy or Hemilaminectomy	7
and Anterolateral Chordotomy	21
and Decompression of Spinal Cord	10
and Drainage of Cerebrospinal Fluid	17
and Exploration	1
and Removal of Tumor	13
and Rhizotomy	4
and Spinal Fusion with Bone Graft	144
and Spinal Fusion with No. 18 Wire	12
and Disceidectomy	1
and Cervical Disceidectomy	4
and Cervical Occipital Fusion	2
Sympathetic Gangliorectomy	4
Sympathectomy, Cervical, Dorsal Lumbar	2
Plastic Repair of Cranium Bifidum	4
Plastic Repair of Spina Bifida	10
Ligation of Artery	5
Exploration of Nerve	1
Neurectomy	4
Nerve Suture	6
Re-opening of Wound with Evacuation	3
Re-opening of Wound with Removal of Bone Flap	1
Re-opening of Wound and Repacking	7
Re-opening of Wound with Drainage of Infection	2
Resuturing of Wound	3

Miscellaneous .....	24
Plaster Cast .....	46
Ventriculo-Peritoneal Shunt .....	25
Cerebral Arteriography — Neck Dissection .....	125
Tic Injection .....	2
Nerve Blocks .....	21
<b>TOTAL</b> .....	<b>813</b>

## ITEMS OF INTEREST

On November 14th, 1954, the mural "The Advance of Neurology", by Miss Mary Filer and presented by Mr. J. W. McConnell, was unveiled by the Honourable Maurice Duplessis, Prime Minister of the Province of Quebec. Many outstanding guests were present. Miss Filer, with her background of nursing at the Montreal Neurological Institute and elsewhere, as well as her experience in creative art has created an outstanding piece of work. A coloured photograph is to be included in the Second Foundation Volume.

Miss Irene Herdan left the Institute to become supervisor of nurses at the Jean Talon Hospital.

Dr. Sidney Traub is now established as neuro-radiologist at the Saskatchewan University Hospital, where he will shortly be joined by Dr. Wm. Feindel.

Miss Jean Cross has recently left the department of Neurochemistry to marry Dr. Publio Silva, a recent Fellow. Miss Jean Fraser and Miss Ruby Brown left the nursing department also to get married. We wish them all much happiness.

The Osler Society of the University of Western Ontario honoured Dr. Francis McNaughton by electing him a member and having him speak at their annual dinner. He spoke on Sir Thomas Browne: The Faith of a Physician. He was also honoured by the Canadian Neurological Society when he was elected president for the year 1954-55.

Early in May Dr. Penfield received an honorary degree of Doctor of Science at the 76th Annual Convocation of the University of Manitoba. He also received an honorary D. de L'U., Paris, 1954.

News from Lebanon reports Dr. Fuad Haddad to be busy, happy and still single.

Dr. Wilder Penfield delivered the Maudesley Lecture before the Medico-Psychological Association in London, England on November 4th, 1954. He spoke on "The Role of Temporal Cortex in Certain Psychical Phenomena."

On November 5th Dr. Penfield received the honorary degree of Doctor of Science from Leeds University, Yorkshire.

On June 11th Dr. William Cone was honoured by Bishop's University with an L.L.D. for the work that he has accomplished within the walls of the Montreal Neurological Institute. "A work that has had significance for the whole world. Now the Chief Neurosurgeon of the Institute Dr. Cone, by his research and skill, has advanced on the frontiers of medical knowledge and has helped to establish new outposts for the hopes of mankind. His has been the special and grateful fame that comes from a work of enterprising mercy."

(From the Gazette, May 10, 1955).

Dr. Donald McRae has been elected President of the Provincial Association of Radiologists.

The Institute was highly honoured in the fall of 1954 by a visit from the Duchess of Kent.

The annual Hughlings Jackson Lecture was given by Professor Norman Dott of Edinburgh. He spoke on "The Common Features in Brain Displacement; by Tumours, by Hemorrhage, and by Violence." The same evening the Montreal Neurological Society had one of its most successful annual dinners. Short addresses, songs and a movie were shown by Dr. Ray Lawson on a trip to the Arctic. Then Dr. Russel told of his experience exploring northern Quebec as a young man.

