

Twenty-second Annual Report

of the

MONTREAL NEUROLOGICAL INSTITUTE

and the

DEPARTMENT OF NEUROLOGY
AND NEUROSURGERY

McGILL UNIVERSITY
1956-57

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REPORT OF THE DIRECTOR

WILDER PENFIELD

The Greek philosopher, Socrates*, said that the “unexamined life is not worth living”. But no man can examine his life until he comes to maturity. Infant and child are activated largely by inborn drives that well up in them spontaneously — desires, emotions, imitative urges, ambitions. At maturity a man may lift his eyes to see the world in which he is living his life. He may examine then his past, his present and perhaps his destiny, giving to his life, by that examination, a worth and purpose. This may apply, as well, to humanitarian institutions such as this one.

Last year I referred to our annual meeting as the twenty-first “birthday of a pair of twins, a Hospital and a Scientific Institute, separate as to budgets and financial support but dedicated to a common cause”. It is more accurate to say that each of these twins has a goal of its own but that neither of the twins could reach his own goal without the aid of the other.

The goal of the Hospital is the relief and the cure of disease. You have heard Dr. Robb’s statement of Hospital finances. There remains a deficit for the care of public patients that may rise, unfortunately, to \$90,000 above the Provincial and City allowance for that purpose. Our work with the sick is a public service and we must do our best to avoid deficits. But if we fail, deficits must somehow be accepted as a public responsibility. I have appealed to Mr. Duplessis in Quebec for a higher rate of coverage. I’m sure that his silence does not mean that the matter has escaped his attention nor that of the Provincial Treasurer, Mr. Gagnon.

RESEARCH AND TEACHING

Let us leave the Hospital and turn to the scientific Institute. Dr. Rasmussen has made a report under this heading. In spite of the steady income derived from the Rockefeller endowment and the Lilly Griffith McConnell Foundation, half of the income for scientific purposes is still dependent on annual grants. It is our major aim to increase the proportion of permanency in our sources of income.

We have received during the year bequests from two former patients of mine: Rupert Bruce of Toronto has left us about \$160,000 and Adèle Springle, \$125,000. Both legacies will be added to scientific endowment and this will increase the permanent income by approximately \$12,000.

Mr. Bruce was a remarkably courageous man who managed his affairs and lived his life effectively to the end, rising above the unavoidable advancing paralysis. Mrs. Springle came to us years ago with a chronic traumatic headache. Fortunately we were able to cure it. She became a generous friend during her life and now that she has gone, we have established, with her bequest, a memorial to her husband, Hobart Springle.

*Plato, Apology of Socrates. Alan Gregg called attention to these words in a charming address to the Association of American Physicians, 1954.

The major need for our scientific work at present is a fund which will provide fellowships for graduate workers who come here. The amount hoped for is \$30,000 annually. A former patient, Miss Virginia Coleman, who happens to be here at the meeting today has given us \$5,000 which is being devoted to this purpose.

During the early years, the University ignored this Institute, being busy with more important matters. Thus, to my great surprise, I discovered that I was a dictator! If Socrates had examined our form of government he would have called it tyranny. But he lived in the days when life was simple and tyranny was sometimes good. This was good too in some ways, but it was bad for the tyrant because he could not keep up with advance.

The impossible is sometimes possible in modern science — but only when team work is introduced. And so the control has passed into the hands of bureaucrats: Rasmussen, Cone, McNaughton, Robb, Jasper, McRae, Elliott, Gilbert, Cosgrove, Eileen Flanagan, Joyce Beatty, Anne Dawson. Some of them have spoken for me this morning.

Perhaps, now that we are in our twenty-second year it is fair to say that we have reached maturity. Lift your eyes then and examine the humanitarian institution in which we work, consider it from a distance.

I have travelled in many countries during the last few years and have seen this Institute with amazement through distant eyes. Men say it occupies a place of leadership. Some even say that it has the very virtues we have hoped for.

The three leading neurosurgeons in India today were once Fellows here, Chandy, Ramamurthi and Ginde. Far away in communist countries, our pupils are building something similar. Yi-Cheng Chao has developed a school of neurosurgeons in China, and Jerzy Chorobski in Poland. Kalman Santha died this year in Hungary, alas. But I learn that his pupils are preparing a volume of contributions to honour him, their master in Neurology.

ARTS, LETTERS AND SCIENCES

The Montreal Neurological Institute is an educational institution with undergraduate and graduate students. If we are to consider its destiny, aside from its role as Hospital, we must try to understand the forces at work in the field of education in Canada today.

Dealing, as we do, primarily with the nervous system of man, we study the mind of man, passing thus into the field of normal and abnormal behaviour. This carries us close to workers in our sister Departments of Neurophysiology and Psychology and Psychiatry.

Scientists and physicians are not to be set apart from the scholars in other branches of higher education. I have much admiration for the work of the Massey Commission. But I have one criticism. It was the report of a Royal Commission on Arts, Letters and Sciences. In spite of that title, it concerns itself

with Arts, Letters and Culture, largely ignoring the Sciences, as though they had already received adequate attention in Canada.

For practical problems, it is true that Science has received much support all round the world in recent years. But in the field of higher education the needs of Science are great. These needs have often been ignored. The scientific departments of universities face the same problem as the Departments of Arts and Letters.

Teaching calls for something more than a desk and a blackboard. At the university level, a good teacher in any department must be an excited man, a man who has seen the unfolding of truth. Any ordinary teacher can pass along general knowledge. But the inspiring teacher is he who is able to pass on his own contagious excitement, as well. Thus he may hope to lead his students to the threshold of their own wisdom.

Intellectual growth is slow and there is no safer place to invest money that will work for all people, than in a university. The oldest subsidy, as far as I know, resulted from an ordinance in 1264 instructing the City of Oxford to pay to their university, because of the unhappy hanging of certain innocent undergraduates, the sum of 52 shillings annually. Oxford still spends this bewildering subsidy every year.

Private educational institutions in this country, at present, are sometimes placed in a dangerous and difficult position. Their original structure was provided by Church or by generous private citizens. But the rising costs of materials and salaries force them to hold out their hats for contributions from one government or another.

They must accept annual grants for their very existence. Such grants, when by chance they are received, are good for the moment. But, in the end, unless they are supplemented by progressive additions to endowment, the universities will lose the independence which was once the source of their greatest strength.

I have no desire to raise political issues. Education and intellectual leadership interest me as they must every thoughtful citizen of this country. I feel sure that certain conditions must be fulfilled if higher education is ever to flower as it should in this country. Our institutions must have stability and independence. And they need financial assistance far in excess of the present level of support.

The recent creation of the Canada Council is an event of great importance. If this Council intends to encourage the Arts and Letters and Culture in focal points throughout the country, it would do well, at times, to contribute to building and to endowment in addition to annual grants.

During the past 50 years the Rockefeller Foundation of New York has made a study of how best to stimulate work, calculated to be lasting, in carefully chosen fields of endeavour. The method is to give assistance for study, followed perhaps by endowment. Let me describe our own experience.

From that Foundation came half of the cost of the original Institute building, together with the initial scientific endowment. Thus we were able to secure a small permanent staff and lay our plans. We were in a position to secure temporary

grants for research when needed. Twice in the years that followed, we turned to the Foundation again for help. Each time, Alan Gregg advised her to make a short term grant which was matched, dollar for dollar, by Montreal friends.

The first grant gave assistance to a research project for three years. This made it possible to bring Herbert Jasper here and to create his, now famous Department of Electroencephalography and Neurophysiology. The second, for five years, brought K. A. C. Elliott and launched his unique Department of Neurochemistry. The experience of the Rockefeller Foundation might well serve now, as a model for governments in their giving, if it is their desire to build for the future, and not alone to gain approbation for the party in power.

From the Federal Government in Ottawa we receive a "block grant" of \$48,500., through the National Research Council, made out to me as an individual. The block grants are their nearest approach to endowment. We are investigated each year to see whether or not we deserve its continuance for the coming year. By receiving it, other members of the Institute staff are disqualified from asking for short term grants for research.

In the ten years since the end of the war, this block grant has saved our scientific work from the retrenchment that would otherwise have been necessary. We are grateful. But the string attached will enable Ottawa to snatch it away any year, although the work of this Institute on the human brain must go on for centuries. The block grant is equal in amount to the annual income from the original Rockefeller endowment.

But, consider the difference. That annual income has amounted to a sum equal to the original endowment itself, a \$1,000,000. since the Institute was founded, and each dollar has gone to research and teaching. And every twenty years, over and over again in the centuries to come, that income, together with the income from the subsequent endowments, will be spent for the same purposes as that spent by wiser men than we, no doubt.

Let us examine this Institute with true Socratic logic. Is it worth its permanent position in the Canadian field of education and research? Our scholarly contributions have been many and various. But time alone will tell their value. It is not for us to judge. One achievement is ours. We have made a beginning. We have set foundation stones in place. The structure that others will build here will be for the service of all mankind.

The Hughlings Jackson Lecturer today is Dr. Herbert Gasser. How small a thing his work on the nerve impulse seems. And yet, it was awarded the Nobel Prize.

The long term project of this Institute is to fill the gap in knowledge between nerve impulse and the mind of man. The brain with its appendages constitutes man's master organ. We have made a beginning of study.

In the years that lie ahead, workers will come, no doubt, to comprehend this master organ. Then, perhaps, they will understand the mind, and even man's behaviour. And, at last, when he is better acquainted with himself, who knows? Man may even understand the love of God.

GRADUATE STUDIES AND RESEARCH

DR. HERBERT JASPER

Reviewing the work presented at the weekly research conferences and roaming the various laboratories and departments of the Institute one finds a great variety of research and clinical investigation being undertaken by members of the staff with a rapidly changing group of research fellows. The main lines of research continue, however, essentially the same over the years.

In the Donner Laboratory of Neurochemistry, with the departure of Dr. and Mrs. Florey and Dr. Bazemore, further studies of the chemical properties and physiological significance of gamma amino-butyric acid and related substances are continuing. This naturally occurring amino acid, called GAB, present in brain tissue, was found to be the most important constituent of Florey's inhibitory factor derived from brain extract. Available evidence indicates that this substance may have an important regulatory action in the mammalian central nervous system; deficiency producing hyperactivity, possibly leading to epileptiform discharge. Studies of acetylcholine metabolism in brain tissue from experimental animals and from tissue removed from epileptic patients at operation is also being continued.

In neurophysiology GAB has been found to depress or inhibit selectively the electrical activity and response in the superficial dendritic layers of the cerebral cortex, without affecting activity in deeper layers. This suggests a specialized inhibitory action with fascinating possibilities especially in view of other evidence that cortical dendrites possess properties of particular significance in the integrative functions of the brain. Long lasting excitatory processes in dendrites in relation to unit neuronal discharge have been analyzed by laminar microelectrode studies of the hippocampus giving some insight into mechanisms of epileptic discharge which so commonly arises in this part of the brain in patients with temporal lobe seizure.

Microelectrode methods have been perfected and extended with the most valuable assistance of Dr. Robert Martin. He has been able to continue some of his previous intracellular studies of the motor end plate in mammalian muscle as well as apply his precise methods to the analysis of excitatory and inhibitory mechanisms in the pyramidal cells of the motor cortex. Other studies include the perfection of a technique for chronic microelectrode analysis of patterns of neuronal discharge during conditioning and in relation to other changes in behaviour in unanaesthetized monkeys. We have also succeeded in perfecting methods for the study of the discharge of single nerve cells in the human cerebral cortex during operative exploration in epileptic patients. Similar studies of unit discharge in chronic epileptogenic lesions in monkeys are also being continued.

Another program of research which has been most fruitful is the analysis of the remarkable changes in behaviour and in discriminative learning ability which occur in monkeys following the careful surgical removal of rhinencephalic portions of the temporal lobe. These wild animals undergo a complete change in

personality becoming tame and indiscriminately affectionate though unable to learn certain kinds of tasks; confirming some of the observations on the functional importance of these portions of the temporal lobe in man.

In the neuroanatomy and neuropathology laboratories the loss of I. Olszewski and co-workers is keenly felt. He is still collaborating in some of the work going on, and some new approaches are being made to studies of the fine structure of the cerebral cortex.

In neurosurgical pathology, the effects of new antibiotics upon the brain are being studied again with further studies of the healing of wounds of the skull and meninges. Research on multiple sclerosis has clarified the significance of changes in blood and spinal fluid chemistry in this and other degenerative diseases of the central nervous system.

The department of anaesthesia has been particularly active in research and teaching in spite of the heavy demands made upon them in operating rooms and wards as well as being always ready to assist in special procedures or emergencies arising in other departments of the Institute. Among the subjects under investigation has been studies of plasma levels of adrenaline and noradrenaline in patients under conditions of stress, studies of carbon dioxide levels in conscious and anaesthetized subjects, and the investigation of some new pharmacological agents. The more active collaboration between this department and neurophysiology and neurochemistry now developing may result in research of more basic significance in the years ahead.

Finally, the caricatures of brain function constantly being studied in the laboratories, on the wards and in the operating rooms, in the form of patients suffering from epileptic seizures, are constantly giving us new insight into the most complex workings of the human brain, and presenting us with new problems for solution. This is the central theme which, more than any other, has given constant direction to our work throughout the life of this Institute. We continue with the conviction that basic research will eventually make the greatest contribution to the rational treatment of diseases of the nervous system.

TEACHING, RESEARCH AND THE LABORATORIES

DR. THEODORE RASMUSSEN

Our undergraduate teaching program this past year continued in the familiar pattern of the past, while awaiting the gradual crystallization of opinion in the Curriculum Committee regarding the best way of modernizing the structure of medical education at McGill. The Committee's recommendations are just beginning to take shape, and the final conclusions will not be ready for transmission to the Faculty until sometime next year. It seems clear, however, that relative conservative means will be found to increase the integration and co-ordination of the basic and clinical sciences, to increase the students' contact with the patients and to make the students' clinical experience a more active and a less passive process.

Neurology and neurosurgery are not independent disciplines to be taught as separate fractions of Medicine and Surgery. We are rather concerned with the functions of the Nervous System in health and disease, in the frame-work of Medicine in its broadest sense. Neurologists and neurosurgeons face common diagnostic problems and, for the most part, employ the same diagnostic techniques, tools, and philosophies.

It is these aspects of the field that are of primary concern to the medical student rather than the special therapeutic maneuvers that separate us into neurologists and neurosurgeons. The efficiency of our undergraduate teaching program, both for the student and the staff, will be increased in proportion to the extent that the re-arrangement of the curriculum permits us to approach this concept of unity in our teaching program.

The combined course of neuroanatomy and neurophysiology, primarily the handiwork of Drs. Jasper, McNaughton and Olszewski, and taught in conjunction with the Departments of Anatomy and Physiology, continues to stand as one of the most successful inter-disciplinary teaching efforts of our Medical School's entire program. Despite the increased load Dr. Olszewski's departure put on Dr. McNaughton and the other members of the clinical staff who helped out with the anatomical aspects of this course during the past year, the high standard of previous years was maintained, and in some respects surpassed. The Institute and Department of Anatomy, however, both need more strength in neuroanatomy. We are, therefore, searching for ways to establish on a firm foundation a long range basic research program in the Laboratory of Neuroanatomy, a program in which the frontiers will be explored with modern dynamic techniques while continuing the traditional emphasis on the functional neuroanatomy we all call upon daily in the study of clinical neurological and neurosurgical problems. This program is needed both for its own sake, and to complement and assist the work of the other research laboratories and clinical departments.

Dr. Gordon Mathieson returns this fall from Scotland to assume direction of the Laboratory of Medical Neuropathology. During this past year the clinical activities of this Laboratory have been ably handled on a care-taker basis by Dr. Mary Jane Aguilar. She and Dr. Warren Sights, under the supervision of Dr. Cone and Dr. Bertrand, and with the help of several other members of the staff, assumed the responsibility for the neuropathological course for the third year students, and provided an excellent course that compared favourably with our efforts of recent years.

The first year's trial run of the new Laboratory of Neuroelectronics has verified Dr. Jasper's wisdom in consolidating the electronic activities of the Institute in this single department. It has been ably and efficiently managed by Dr. Martin in this, its maiden year. It is with regret, however, that we must announce that Dr. Martin soon leaves to accept a post in the Department of Physiology of the Medical School of the University of Utah in Salt Lake City. Our best wishes go with him.

Another resignation that we report with regret is that of Dr. Bethune from the Department of Anaesthesia. His willing, pleasant and capable work in this department will be missed. The department has been kept at full strength, however, by the appointment of Dr. G. F. Brindle, a Montrealer, graduate of McGill and of the Diploma Course in Anaesthesia of McGill.

Our professional roster has been strengthened during this past year by several appointments to the Consulting and Adjunct Staff. Dr. Jean-Léon Desrochers, Associate Professor of Neurology of the University of Montreal and Neurologist and Psychiatrist at the Hotel Dieu, has been appointed Consulting Neurologist. Dr. J. G. Robson, Wellcome Research Professor of Anaesthesia at McGill, has been appointed Consulting Research Anaesthetist. Dr. R. W. Reed, Professor of Bacteriology at McGill, has been appointed Consulting Bacteriologist. Dr. Norman M. Brown and Dr. R. E. Fraser, Lecturers in the Department of Radiology at McGill and the Royal Victoria Hospital, and Dr. Jean Léger, Chief of the Department of Radiology at Notre Dame Hospital, have been appointed Adjunct Radiologists.

Benefactions during the past year have fortunately enabled us to meet the constantly rising cost of living in the laboratories, and to increase the residents' stipends so they approach a little more closely the bare subsistence level. One of these gifts, the Evelyn Robins Memorial Fund, is of especial interest, since Dr. George D. Robins, the donor, is Montreal's pioneer neurologist, even antedating the entrance of the late beloved Colin Russel into this field. This fund is supporting investigations in the field of cerebral vascular disease.

During the past year, grants for special projects totalled \$42,000.00, financing a significant proportion of the research work of the Institute. The high percentage of successful applications for grants each year gives a measure of the esteem with which the scientific work of the Institute is held by private and governmental granting agencies. We are grateful for this essential financial support, but it is not entirely an unmixed blessing. The lack of assurance of continued support creates serious difficulties in planning and carrying out long range and basic research programs. The time spent in writing progress reports and drafting new applications makes heavy inroads on valuable staff research time, which is subject to all too many unavoidable erosions from service functions, teaching commitments, administrative data, etc.

Endowment for Fellowships, the need for which was commented upon in last year's report, would do much to lessen our dependence on the yearly scramble for project grants, and would, therefore, promote the scientific programs in all of the laboratories and clinical departments. We have not yet been successful in securing any major endowments for Fellowships, but the hope and the search continues.

A brief analysis of our Fellowship and Resident Staff of thirty, shows that during this past year fifteen, or half, have been assigned to the clinical services, and half to the laboratories. Sixteen of this group of thirty are headed for careers in neurosurgery, six are interested in neurology, and six are aiming their careers

toward laboratory and basic research work. The latter group of Fellows play a particularly important role in the research program of the laboratories, and are the group most dependent on project grants.

An indication of the success of the graduate teaching program of the Institute through the years, was afforded by the recent Fellows' Re-Union. Fifty former Fellows and wives from all parts of the United States and Canada returned to pay tribute to the Penfields and the Cones with a celebration which was initiated, planned and organized by a group of the older Fellows. A still larger number, who were unable to attend, sent letters, telegrams and donations, some coming from distant lands such as India and China. The social and scientific aspects of this re-union provided a striking manifestation of the esprit-de-corps that has always characterized the M.N.I. family. Held in conjunction with this re-union was the first Fellows' Lecture, the first of a projected series of annual lectures to be given by a former Fellow selected each year by the current group of the Fellows. This project, initiated as a result of the work of the Fellows' Society over the last two years, was given an auspicious inauguration by the scholarly address of Dr. Joseph Evans, Professor of Neurological Surgery at The University of Chicago, summarizing his research work in the field of cerebral trauma.

There are many ways in which the productiveness of an Institute such as this can be measured — lives saved, disability and pain prevented or lessened, function restored, the mounting list of publications, degrees earned and conferred, but not the least of these is the record of the Fellows as their careers develop in many parts of this continent and the world. This record can be pointed to with special pride by the entire Institute staff and by the many benefactors whose help has been important in making this record possible.

CLINICAL STAFF

Director

WILDER PENFIELD, O.M., C.M.G., M.D., D.Sc., F.R.C.S.(C),
Hon. F.R.C.S. (Eng.), F.R.S.C., F.R.S. (London), Hon. F.R.C.P. (Eng.)

Neurologist-in-Chief

FRANCIS MCNAUGHTON, B.A., M.Sc., M.D., C.M.

Neurologist

PRESTON ROBB, B.Sc., M.Sc., M.D., C.M.

Associate Neurologists

DONALD LLOYD-SMITH, B.Sc., M.D., C.M., F.R.C.P.(C)
ARTHUR YOUNG, M.D., C.M., F.R.C.P.(C)

Assistant Neurologists

JAMES B. R. COSGROVE, M.D., M.Sc., M.Sc. (Cantab.)
BERNARD GRAHAM, B.A., B.Sc., M.D., C.M.
DAVID HOWELL, M.B., B.S. (Lond.), M.R.C.P. (Lond.)
REUBEN RABINOVITCH, B.A., M.D., M.Sc.
WILLIAM TATLOW, M.D. (Lond.), M.R.C.P. (Lond.), F.R.C.P.(C)

Clinical Assistant in Neurology

IRVING HELLER, M.D., C.M., M.Sc.

Neurosurgeon-in-Chief

WILLIAM CONE, B.S., M.D., F.R.C.S.(C), F.R.S.C.

Neurosurgeons

ARTHUR ELVIDGE, Ph.D., M.D., C.M., F.R.C.S.(C)
WILDER PENFIELD
THEODORE RASMUSSEN, B.S., M.B., M.D., M.S., F.R.C.S.(C)

Associate Neurosurgeons

GILLES BERTRAND, B.A., M.D., M.Sc., F.R.C.S.(C)
LAMAR ROBERTS, A.B., M.D., M.Sc., Ph.D.

Roentgenologist

DONALD McRAE, M.D.

Electroencephalographer

HERBERT JASPER, Ph.D., D. ès Sci. (Paris), M.D., C.M.

Associate Electroencephalographer

PIERRE GLOOR, M.D. (Basle), Ph.D.

Anaesthetist

R. G. B. GILBERT, M.B., B.S. (Lond.), F.R.C.P.(C), M.R.C.S., L.R.C.P.,
D.A., R.C.S., F.F.A.R.C.S., F.A.C.A.

Associate Anaesthetist

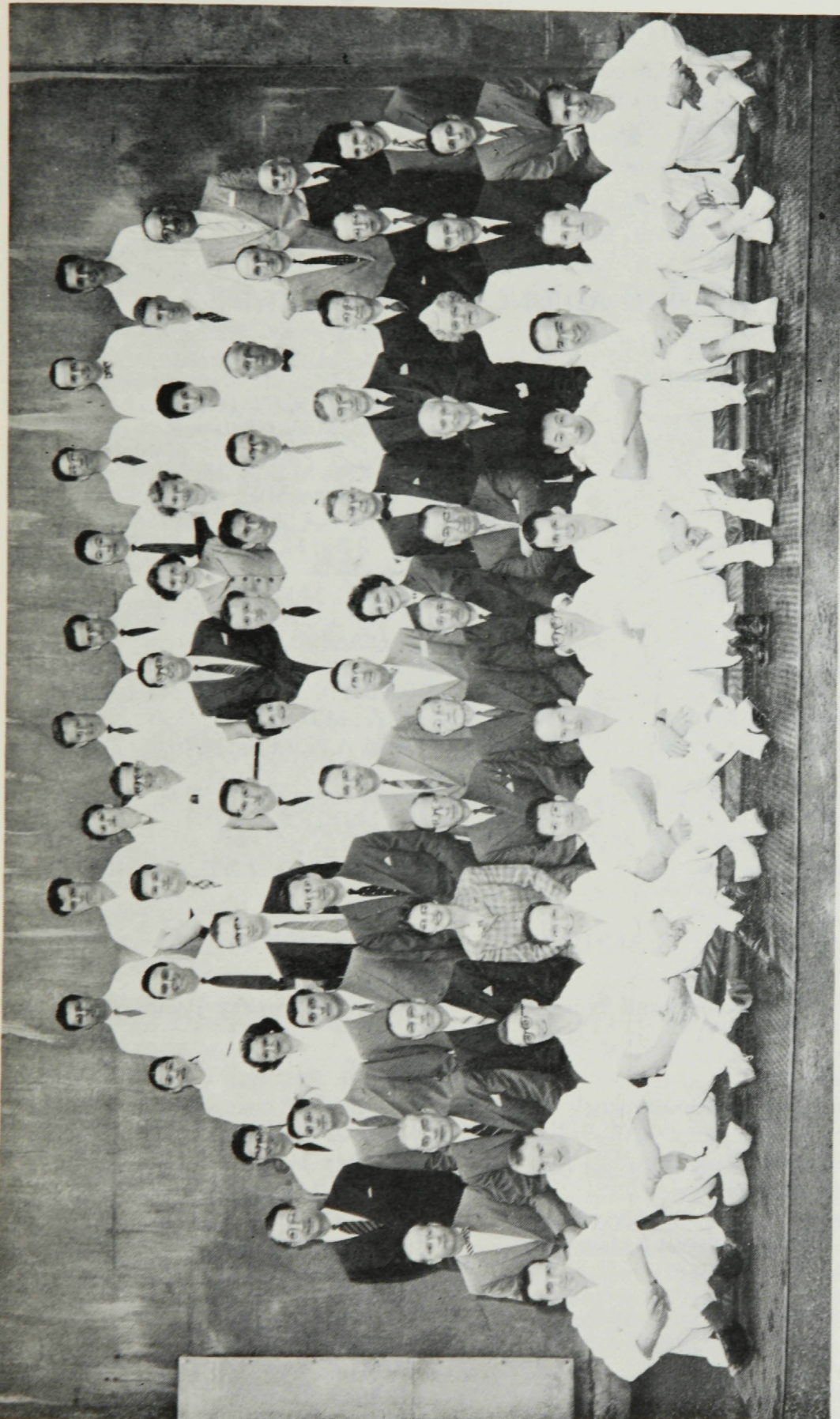
R. A. MILLAR, M.D., Ch.B. (Edin.), F.F.A.R.C.S.

Assistant Anaesthetist

G. F. BRINDLE, B.A., M.D., C.M.

Neurochemist and Donner Fellow

K. A. C. ELLIOTT, M.Sc., Ph.D., Sc.D.



Bottom row, left to right: Drs. H. Samson; D. Thompson; V. Kleider; M. Rayport; A. K. Tarazi; P. Perot; A. M. House;
 W. Troup; C. Tsai; D. Brichetti; J. Kennedy; R. Lende.
 Second row, left to right: Drs. G. Brindle; D. McGrae; P. Robb; Miss J. Beatty; H. H. Jasper; H. S. Gasser; C. James;
 W. V. Cone; W. Penfield; Miss B. Cameron; T. Rasmussen; R. W. Reed
 Third row, left to right: Drs. R. Gilbert; F. G. Robson; L. Robert; I. Heller; P. Gloor; Mr. P. Hogan; B. Milner;
 K. A. C. Elliott; A. Elvidge; D. Lloyd-Smith; B. F. Graham; G. Bertrand.
 Fourth row, left to right: Mr. N. vanGelder; Drs. B. Ricci; R. Millar; E. Osmolski; I. Hildebrand; B. Cosgrove;
 J. A. Aguilar; B. Miller; J. Zimmer; F. L. McNaughton; N. Viner.
 Fifth row, left to right: Drs. M. J. Aguilar; G. Ricci; H. McDonald; J. Litvak; E. Berger; H. Papius; D. Johnson;
 R. H. Longo; B. K. Doane; R. Rabinovitch.
 Sixth row, left to right: Drs. R. Moliner; W. Sights; J. Pace; T. Ban; C. Shih; M. Numoto; C. Branch; R. Martin.

Associate Neurochemist
HANNA PAPPIUS, B.Sc., Ph.D.

Neuropathologist
GORDON MATHIESON, M.B., Ch.B. (Aberdeen)

Clinical Psychologist
BRENDA MILNER, B.A., M.A., (Cantab.), Ph.D.

CONSULTING AND ADJUNCT CLINICAL STAFF

Consulting Neurologist	ROMA AMYOT, B.A., M.D. (Montréal and Paris)
	SYLVIA CARON, M.D., F.R.C.P.(C)
	JEAN SAUCIER, B.A., M.D. (Paris and Montréal)
	NORMAN VINER, B.A., M.D., C.M.
	JEAN-LÉON DESROCHERS, M.D.
Adjunct Neurosurgeons	CLAUDE BERTRAND, B.A., M.D., F.R.C.S.(C)
	HAROLD ELLIOTT, B.Sc., M.D., C.M.
	JEAN SIROIS, B.A., M.D.
Consulting Anaesthetist	HAROLD R. GRIFFITH, M.M., B.A., M.D., C.M., F.A.C.A., F.I.C.A., F.F.A.R.C.S. (Eng.), F.R.C.P.(C)
Consulting Research Anaesthetist	J. G. ROBSON, M.B., B.Ch. (Glasgow), F.F.A.R.C.S. (Eng.)
Consulting Bacteriologist	R. W. REED, M.A., M.D., C.M.
Consulting Roentgenologist	CARLETON PEIRCE, A.B., M.Sc., M.D., F.A.C.P.
Adjunct Roentgenologists	NORMAN M. BROWN, B.A., M.D., C.M.
	ROBERT FRASER, M.D., F.R.C.P.(C)
	JEAN L. LÉGER, M.D.
Consulting Radiation Therapist	JEAN BOUCHARD, M.D., D.M.R.E. (Cantab.)

TEACHING STAFF

A. Department of Neurology and Neurosurgery, McGill University Faculty of Medicine.

Chairman of Department	WILDER PENFIELD
Professor of Neurology and Neurosurgery	THEODORE RASMUSSEN
Professor of Neurosurgery	WILLIAM CONE
Professor of Experimental Neurology	HERBERT JASPER
Associate Professor of Neurology	FRANCIS MCNAUGHTON
Associate Professor of Experimental Neurology	K. A. C. ELLIOTT
Associate Professor of Neurological Radiology	DONALD McRAE
Assistant Professors of Neurology	PRESTON ROBB
	ARTHUR YOUNG
	W. F. T. TATLOW
	DONALD LLOYD-SMITH
	JAMES COSGROVE
Assistant Professors of Neurosurgery	ARTHUR ELVIDGE
	HAROLD ELLIOTT

Assistant Professor of Neuropathology	GORDON MATHIESON
Assistant Professor of Experimental Neurology	PIERRE GLOOR
Lecturers in Neurology	BERNARD GRAHAM REUBEN RABINOVITCH
Lecturers in Neurosurgery	LAMAR ROBERTS (Reford Fellow) GILLES BERTRAND
Lecturer in Neurochemistry	HANNA PAPIUS
Lecturer in Clinical Psychology	BRENDA MILNER
Demonstrator in Neurology	IRVING HELLER
Demonstrators in Neurosurgery	RANKIN HAY WARREN SIGHTS
Demonstrator in Neuropathology	GORDON THOMPSON
Demonstrator in Electroencephalography	LEWIS HENDERSON

B. Department of Neurology and Neurosurgery, McGill University Faculty of Graduate Studies and Research.

Professors	WILLIAM CONE
(Chairman)	HERBERT JASPER THEODORE RASMUSSEN
Associate Professors	K. A. C. ELLIOTT FRANCIS MCNAUGHTON DONALD McRAE
Assistant Professors	ARTHUR ELVIDGE PRESTON ROBB

**EXECUTIVE STAFF OF THE MONTREAL
NEUROLOGICAL INSTITUTE**

Director	WILDER PENFIELD
Deputy Director	THEODORE RASMUSSEN
Assistant Director (Scientific)	FRANCIS MCNAUGHTON
Assistant Director (Hospitalization)	PRESTON ROBB
Registrar	BERNARD GRAHAM
Business Manager	PETER J. HOGAN
Executive Secretary	MISS ANNE DAWSON

RESIDENT STAFF — July 1956 — July 1957

Senior Resident	VICTOR KLEIDER
Neurosurgical Services	
Residents	MARK RAYPORT, CHEN TSAI*, RICHARD LENDE*
Assistant Residents	ELLIS KEENER, GORDON THOMPSON, ANTONIO AGUILAR, EMIL BERGER*, YOON BOM KIM*, ANTONE TARAZI*, DANIEL BRICHETTI*
Neurological Services	
Teaching Fellow	HUGH McDONALD
Residents	JOHN KENNEDY, PHANOR PEROT

Assistant Residents	DANICA VENECEK, ALEXANDER de WILLEBOIS*, HANS BAMMER*, JOHN LITVAK*, ANTOINE TARAZI*, EMIL BERGER*, HUGH SAMSON*, ARTHUR HOUSE*, J. LEWIS**, A. G. KENDALL**, L. KOVACS**, V. J. CAMPBELL**, G. E. EDDY***, B. LONGPRÉ***, D. THOMPSON***, J. G. HELLSTROM***, C. H. HOLLENBURG***, W. J. TROUP***
Residents in Anaesthesia	G. F. BRINDLE*, J. CULVERHOUSE*, OUIDA d'ABREU*, E. OSMOLSKI*, I. HILDEBRAND*
Fellow in Neuroradiology	VINCENZO VALENTINO

~~—~~ *Six months on this service

**On rotation from Royal Victoria Hospital

***On rotation from Montreal General Hospital

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) Switzerland, Ph.D.
Electroencephalographic Fellows	B. RICCI, M.D. (Rome) Italy C. TSAI, M.D. (Shanghai) China
Visiting Fellow	R. H. LONGO*, M.D. (Sao Paulo) Brasil
Electromyographic Fellow	MITSUO NUMOTO, M.D. (Okayama) Japan
Chief Technician and Demonstrator	LEWIS HENDERSON

Experimental Neurochemistry

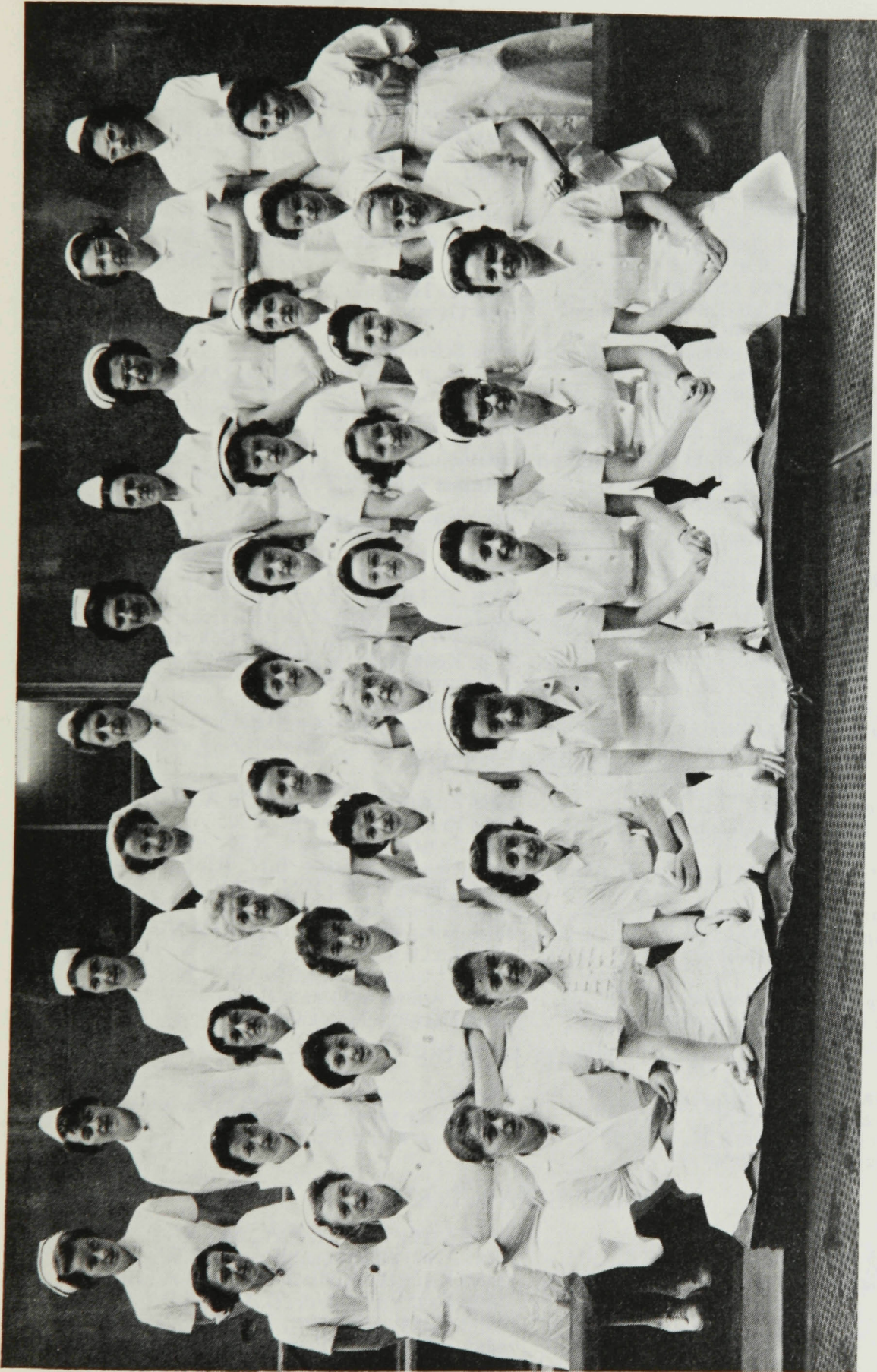
Neurochemist and Donner Fellow	K. A. C. ELLIOTT, M.Sc., Ph.D., Sc.D. (Cantab.)
Associate Neurochemist	HANNA M. PAPIUS, M.Sc., Ph.D. (McGill)
Assistant Clinical Neurochemist	IRVING H. HELLER, M.D., M.Sc. (McGill)
Research Assistants	NICO VAN GELDER, B.Sc. (McGill) DOROTHY MCLEAN JOHNSON*, Ph. D. (Toronto)

Neuroanatomy and Medical Neuropathology

Neuropathologist	GORDON MATHIESON, M.B., Ch.B. (Aberdeen) Scotland
Fellows	MARY JANE AGUILAR, B.A., M.D. (Colorado) JOHN PACE, B.A., M.D. (Yale) THOMAS BAN*, M.D. (Budapest) Hungary LIESELOTTE GERHARD, M.D. (Dusseldorf) Germany
Chief Technician	RAMON MOLINER, M.D. (Madrid) Spain BARBARA NUTTALL

Neurophysiology

Neurophysiologist	HERBERT JASPER, Ph.D., D.ès Sci. (Paris), M.D., C.M.
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Bottom row, left to right: D. GODBOUT (OR); R. DUCHEMIN (3S); H. PITSCOUKAKIS (2N); B. O'LEARY (4N); B. BUDGEEL (2N);
 M. PATON (3S); A. KIMBERLEY (3S).
 Second row, left to right: J. MALLORY (3E); J. BEAMAN (4N); L. HALL; P. HARRISON; B. CAMERON; P. STANLEY (OR);
 E. CARMAN, M. CAVANAUGH (2S); V. STORLE (2E).
 Third row, left to right: M. POOLE (3N); I. SIMPSON (4S); M. PRIZANT (4S); A. CAMERON (4S); G. MORIN (4S);
 H. BELANGER (2S); E. ADAM (2S); L. KANE (3N); D. MACDONALD (2S); G. MORGAN (4N); J. BAILEY (3N).
 Top row, left to right: S. PETRIE (3N); J. MACMILLAN (OR); P. THOMASON (OR); M. SHAVER (OR); H. CALLANDER (OR);
 A. PUSAT (3S); R. BOYER (4N); B. BALL (2E); J. EMMS (3N); J. GRIFFITHS (2E).

Assistant Neurophysiologist	A. R. MARTIN, M.Sc. (Man.), Ph.D. (Lond.) England
Fellows	JACK ORBACH, Ph.D. (Princeton) CHARLES BRANCH, M.D. (Vanderbilt) G. F. RICCI, M.D. (Rome) Italy K. IWAMA*, M.D. (Sendai) Japan
<i>Photography</i>	
Supervisor	GILLES BERTRAND, B.A., M.D. (Montréal) M.Sc. (McGill)
Photographer	CHARLES HODGE
Assistant Photographer	JOHN GUNN
<i>Research in Multiple Sclerosis</i>	
Chief	JAMES B. R. COSGROVE, M.D. (Man.) M.Sc. (Cantab.)
Chemist	PAMELA AGIUS, B.Sc.
<i>Surgical Neuropathology</i>	
Neuropathologist	WILLIAM CONE, B.S., M.D., F.R.C.S.(C), F.R.S.C.
Assistant Neuropathologist	GILLES BERTRAND, B.A., M.D. (Montréal) M.Sc. (McGill)
Neuropathological Fellows	WARREN SIGHTS, M.D. (Chicago) RICHARD LENDE*, M.D. (Oregon) ARMANDO ORTIZ*, M.D. (Mexico) JOHN LITVAK*, B.A., M.D. (Colorado) Y. B. KIM*, C.B., H.B. (Seoul), Korea C. J. SHIH*, M.B. (Taiwan)
Chief Technician	JOHN GILBERT

*Six months on this service

NURSING STAFF

Director of Nursing	MISS EILEEN C. FLANAGAN, B.A., R.N.
Assistant Directors of Nursing	MISS BERTHA CAMERON, R.N. MRS. ELEANOR CARMEN, R.N.
Instructor	MRS. CAROLINE TOSH, B.N., R.N. MISS LOUISE HALL, B.N., R.N.
Supervisor Dressing Rooms	MISS ANNIE JOHNSON, R.N.
Night Supervisor	MISS ELIZABETH BARROWMAN, R.N.
Assistant Night Supervisors	MISS LILLIAN MCAULEY, R.N. MISS ELIZABETH A. MORGAN, R.N.
Operating Room Supervisor	MISS PHOEBE STANLEY, R.N.
Assistant Operating Room Supervisor	MISS PATRICIA MURRAY, R.N.

HEAD NURSES

MISS MARY CAVANAUGH, R.N.	MRS. GEORGETTE JOTIC, R.N.
MISS VIOLA STORLE, R.N.	MISS KATHERINE AINGER, R.N.
MISS ALICE CAMERON, R.N.	MISS IRENE MACMILLAN, R.N.
MISS LENORE KANE, R.N.	

SOCIAL SERVICE STAFF

Director	MISS JOYCE BEATTY, B.A., M.S.W.
Casework Supervisor	MRS. GERINE PHILLS, B.A., M.S.W.
Junior Caseworkers	MISS KATHLEEN MACDONALD, B.A., B.S.W. MISS BETTY FOLLIOTT, B.A., M.S.W. MISS CYNTHIA BALCH, B.A., M.S.W. MRS. MARGARET PUVREZ, Diploma in Social Work (U. of M.)

APPOINTMENTS HELD IN
TEACHING HOSPITALS OF MONTREAL
BY MEMBERS OF STAFF
ROYAL VICTORIA HOSPITAL

<i>Neurologist and Neurosurgeon-in-Chief</i>	WILLIAM CONE
<i>Neurologist</i>	FRANCIS L. McNAUGHTON
<i>Neurosurgeons</i>	ARTHUR R. ELVIDGE WILDER PENFIELD THEODORE RASMUSSEN
<i>Associate Neurologists</i>	DONALD LLOYD-SMITH PRESTON ROBB ARTHUR W. YOUNG
<i>Assistant Neurologist</i>	REUBEN RABINOVITCH
<i>Clinical Assistants in Neurology</i>	J. B. R. COSGROVE B. F. GRAHAM I. H. HELLER
<i>Clinical Assistants in Neurosurgery</i>	GILLES BERTRAND LAMAR ROBERTS
<i>Physician-in-Charge of Electroencephalography and Electromyography</i>	HERBERT JASPER
<i>Associate Radiologist</i>	D. L. McRAE
<i>Associate Anaesthetist</i>	R. G. B. GILBERT

MONTREAL GENERAL HOSPITAL

<i>Neurosurgeon-in-Chief and Director</i>	H. ELLIOTT
<i>Associate Neurologist</i>	W. F. T. TATLOW
<i>Assistant Neurologist</i>	DAVID HOWELL
<i>Consultant in Electroencephalography</i>	HERBERT JASPER
<i>Consultants in Neurology</i>	FRANCIS McNAUGHTON PRESTON ROBB
<i>Consultants in Neurosurgery</i>	WILLIAM CONE ARTHUR ELVIDGE WILDER PENFIELD

MONTREAL CHILDREN'S HOSPITAL

<i>Consultants</i>	W. V. CONE A. R. ELVIDGE H. H. JASPER F. L. McNAUGHTON D. L. McRAE WILDER PENFIELD THEODORE RASMUSSEN A. W. YOUNG
<i>Director — Neurology and Cerebral Palsy Division</i>	J. P. ROBB

REPORT OF THE NEUROLOGIST

DR. FRANCIS MCNAUGHTON

The work of a Neurological Department goes on year after year, dealing with the diagnosis and treatment of patients with acute and chronic disorders of the nervous system. Arresting new developments in the clinical field do not come as often as we would like, though I trust that each year brings a quiet accumulation of experience for those who labour here.

Each year there is an increasing use of our beds for neurological diagnosis and greater demands for consultation in the wards of the Out-Patient Clinic of the Royal Victoria Hospital.

The rising costs of hospital care has also added to the pressure on our staff as patients continually urge us to shorten their hospital stay in order to save them money. There is always the temptation, which we must resist, to make short cuts and to pass over important things. After all, it is the patient in the end who will suffer.

Of the Out-Patients' Clinics I will mention once more the Epilepsy Clinic, which continues to flourish with the help of the annual Federal-Provincial rehabilitation grant. New anti-epileptic drugs are tested in the Clinic and an attempt is made to control seizures and help in the slow process of rehabilitation.

Dr. Shirley Ferguson has joined our staff as psychiatrist replacing Dr. Mergler, who resigned early in 1957. We are just at the moment trying the experiment of bringing together a group made up of the parents of school age children with epilepsy, in order to learn something of their problems and to help them towards a solution. We have been helped in the work of the Epilepsy Clinic by the close cooperation of the Occupational Therapy and Rehabilitation Centre, and by the Foyer Dieppe at St. Hilaire.

The training of young men and women in the fundamentals of clinical neurology, whether undergraduates or post graduates, assumes an increasing amount of the time of our Staff. In this connection, I would like to single out particularly the work of the Seniors during the past year, Dr. John Kennedy and Dr. Phanor Perot. I would also like to mention the work of Dr. Hugh MacDonald, who has held the post of Teaching Fellow. Dr. MacDonald came to us last September after three years of training in the Mayo Clinic, and his teaching for students and internes, and consultant work here has been outstanding. In the autumn he leaves to join the staff of Dalhousie University, and we can only congratulate Dalhousie on its choice of a promising young neurologist.

I am happy to report a new development in our training program in Neurology. Last spring we were invited by the National Institute of Neurological Diseases and Blindness at Bethesda, an Institute administered by the United States Public Health Service, to apply for a training grant in Neurology and within the last few weeks we received word that an annual grant to the Montreal Neurological Institute has been approved. The aim of the Training Grant in Neurology is to encourage the thorough training of Neurologists, who will become teachers and research workers in a field which in recent years has been depleted.

While training stipends will be limited to citizens of the United States, the grant will also contribute towards the teaching costs in the basic neurological sciences, and in many ways will strengthen our teaching program, particularly in the more senior years of training. This grant is eloquent evidence of the mutual trust which exists between our two countries, and it is also to be considered as a recognition of the contribution which the Institute has been making to the United States since its foundation.

REPORT OF THE NEUROSURGEON

DR. WILLIAM CONE

The year was a busy one. Of the 2,540 admissions to the Institute during 1956, 1,330 were to the neurosurgical services. 914 major operative procedures were carried out. Many minor ones not listed have been done in the dressing rooms. Among these are included biopsies of cerebral and cerebellar tumours, twist drill holes and ventricular punctures, drainage of subdural haematoma, injections for trigeminal neuralgia, suture of lacerated wounds of the scalp, and application of Barton tongs to the skull for traction. Though these procedures in the dressing rooms increase the nursing load on the floors, they add interest and understanding.

Operative infections have been so rare and the rate so low that the skeptic can argue that we are either failing to recognize infections or failing to report them. Miss Phoebe Stanley and her staff have maintained rigid standards of aseptic technique in the operating room. On the wards, Miss Bertha Cameron has developed an elegant aseptic technique for the treatment rooms. The individual dressing set units are autoclaved now rather than boiled. If the rooms were air-conditioned they would be almost as safe as the operating suites.

The increasing power and complexity of the mechanical equipment used in both civilian and industrial pursuits are changing the picture of trauma to which we are accustomed. Most patients we see now with injuries to the brain, spinal cord and peripheral nerves have other serious injuries as well. We have been fortunate here in having such splendid help from orthopaedics, otolaryngology, thoracic, plastic, genito-urinary and general surgery, and from general medicine, in the management of these patients with multiple injuries. The contact with these other fields of medicine and surgery has been of great benefit to both the attending and the resident staff.

As the years pass, the value of the post-graduate course in neurological and neurosurgical nursing, which Miss Flanagan instituted some years ago, has become increasingly evident. From the nurses taking the course we have gained much. As they consider our ways of doing things, and discuss points of difference, we have been often led to change. They have carried our methods to the far corners if they have not stayed on the staff here.

A word of appreciation is due to our attendants for their good work. Miss Bertha Cameron has helped them in their training. Her personal interest and supervision has had the same salutary effect as in other areas to which she has directed her attention. She in turn has had some help from Mr. T. M. Davison, R.N., supervisor of male attendants at the Royal Victoria Hospital.

There are several points of general interest that I should like to mention. Dr. Elvidge is President of the American Academy of Neurological Surgery. The Cancer Research Society has continued to contribute funds to provide a bed for the needy patient with tumour. The Cancer Aid Society has renewed their grant to help these patients financially. Miss Beatty, in charge of Social Service, can witness for us how much these grants have meant. Mr. M. Goldberg gave the Anaesthetic Department a high fidelity record player. Dr. Gilbert can say what music in the operating room has meant to some of the patients undergoing operation under local anaesthesia. I hope the library of records will be large and varied so that the operating room staff will not have to listen to the same music day after day.

Our interest in the transportation of the sick and wounded by air continues. Two patients from the Canadian Armed Forces abroad, who sustained serious injuries, have been flown here — one late last year from Germany, and recently one from Italy. The patients stood the long flights well. Royal Canadian Air Force Sikorsky Helicopters have continued to bring in very seriously injured patients from nearby districts—the most recent one was flown in from Shawinigan Falls last night. Dr. Gilbert Turner tells me the Montreal Hospital Council has discussed the possibility of establishing a Helicopter Ambulance service based in Montreal. The initial and operational costs seem to be prohibitive at the present time when hospital deficits are mounting. For the present at least we will have to depend on the R.C.A.F. Transport Command Helicopter Branch for the short runs.

On Monday, May 13th, Miss Elizabeth Murdoch died. She had protected Dr. Elvidge and looked after his interests for years, and had done a great deal for all of us. We admired her for her courage, ingenuity and fixity of purpose.

REPORT ON HOSPITALIZATION

DR. PRESTON ROBB

When one contemplates the contents of this report, one cannot help but have mixed feelings — a feeling of pride at the accomplishments of the past year, a feeling of anxiety over the problems of the day, and grave concern at the ever increasing cost of patient care.

Hospital Statistics

In 1956 there were 2,540 patients admitted, an increase of 8.3% (196) over the previous year, an all time record for the Institute. The total number of hospital days was 44,957, an increase of 0.6% (277) over 1955. This represents

an average occupancy of 91.2%. To operate at such a high and dangerous level meant that at times we had more than 100% occupancy, made possible by using extra beds and cots. The average length of hospitalization fell from 19 to 17.7 days. This tendency towards shorter hospital stays is even more apparent in the current year. There were 114 deaths and a commendable autopsy rate of 85%. There were 914 surgical procedures, slightly less than the previous year.

We continued to have a high percentage of indigent patients for whom we received less than $\frac{1}{3}$ of the cost of their care. The number of paraplegic, quadriplegic, unconscious and other patients requiring total nursing care is still a major problem, not only in caring for them here, but also trying to find suitable places for convalescent and long term care.

The Out-Patient Clinics have been as active as ever. The total number of patients seen was 5,008, a slight increase over the previous year. In the Neurology Clinic there were 489 new patients seen, 3,432 revisits and 167 visits to the night clinic. In Neurosurgery there were 209 new patients seen and 711 revisits. It must be made clear that the clinics, operated by the Royal Victoria Hospital provide an essential and welcome part of the patient care program, but they do create many problems. Many of the clinic patients present as grave social problems requiring a great deal of time and skill by the social workers. Reference should be made to the excellent work done by Miss Margaret Gurd, the Clinic Secretary. She has made many thoughtful suggestions which have helped to make the clinics run as smoothly as they do.

Records

During the year a great deal of difficulty was encountered with the records. This was due chiefly to trouble obtaining and maintaining adequate secretarial help. During a large part of the year it was not possible to type all of the case histories. This has now been corrected and it is my hope that the same situation will not arise again. A great deal of credit must go to Doctor Graham, Mrs. von Nida and her staff for the excellent and loyal way in which they have carried on. Mrs. von Nida seems to have a natural affinity for people in distress. One cannot measure the value of the help she gives to so many.

Professional Care

A year ago some of the factors behind the high cost of nursing were analyzed. We are still faced with the same problem, the ever increasing cost of providing nursing care in its broadest sense. The Institute has a grave responsibility, not only towards the patient, but also in providing leadership in neurological and neurosurgical nursing throughout Canada. This was brought home forcibly when Doctor Harold Rosen of Saint John, New Brunswick pointed out that one of the best things about his service were the 6 nurses who had trained at the Institute.

One of the biggest problems has been trying to budget for nursing care. To date we have been unable to accurately predict the cost of professional care. An effort has been made to establish a complement of nurses, and by sticking to this, more accurate predictions, we hope, can be made. Time will tell!

Social Service

The Social Service Department continues to run smoothly under the direction of Miss Joyce Beatty. Her report covers the activities of the Department. We are long past the stage where Social Service need be justified. However, it is one department for which there is no income. The Social Service Committee, under the Chairmanship of Dr. McNaughton, is presently conducting a study to determine what staff is necessary to operate a first-class department. The contributions of the Women's Auxiliary of the Royal Victoria Hospital towards the operation of the department and the relief of needy cases has been most welcome. It is our hope that the Coffee Shop will continue to flourish.

Business Office

The problems of the Business Office have been well summarized in the report of the Urwich-Currie Ltd., Management Consultants, who recently reviewed the Business Administration. Alterations are presently underway to increase efficiency and office space.

It was indeed welcome news to hear that Q.P.C.A. rates would be increased. The announcement was somewhat misleading when it said the new rate would be \$15.75. Actually the hospital will receive \$10.50, an increase of \$3.00 per patient per day. This represents only about 40% of the actual cost. The cost per patient per day to the end of March of this fiscal year is \$26.51, a 12% increase over last year. At the National Institute for Neurological Diseases and Blindness, Dr. Pierce Bailey tells me it costs them \$50.00 per patient per day. This Institute is also a National one. We are not trying to imitate the National Institute but I would point out that our cost per patient per day is still far below those of similar Institutes or Hospitals in the States. The anticipated deficit at the end of the current fiscal year is expected to be around \$90,000.

Hospitals today, and ours is no exception, are in a very serious dilemma. Wages are increasing, and there is a serious shortage of trained personnel. We have been particularly fortunate in that Miss Flanagan has been able to provide adequate nursing care. Most hospitals today face a very serious shortage of nurses. Here our good fortune ends. Good orderlies are scarce, and we often employ men who work at two jobs. Secretarial and bookkeeping help has been almost impossible to get. On Monday last, Mr. Milligan was 4 men short.

At this point I must stop and pay tribute to the loyal support of all the staff who have been working "beyond the call of duty", to keep things going. Particularly in the Business Office where conditions have been trying indeed. We want each one to know how much we appreciate their support. Mr. Hogan is extremely pleased with the new additions and he hopes that recommended changes may soon be implemented. There is urgent need for the Business Manager to be freed from the detail that ties him down. From what I can determine, it is not a matter of wages as much as a true shortage of personnel. However, this shortage indirectly forces wages up, costs rise, and rates eventually must be increased. It is the poor patient in the end who suffers.

The hospital cannot keep up with the current inflation and the rising cost of living. We must continue to operate as economically as possible, at the same time maintaining the standards which have made the Institute famous.

REPORT OF THE DIRECTOR OF NURSING

MISS EILEEN C. FLANAGAN*

The Nursing Department, like all others in the Institute, is each year being called on to meet greater demands on its resources of personnel and to carry on its work under an increasing tempo of activities.

During 1956 we nursed almost 200 more patients than in 1955, an increase of 831 nursing periods. Since we operate on an 85% to over 100% bed occupancy this means that the average length of stay is being markedly reduced, with a corresponding increase of examinations, dressing room procedures, and a higher percentage of acutely ill patients.

There were 603 special nurses on duty for 5,055 nursing periods, an average of 8.4 per nurse or less than 3 days each. The total nursing periods covered were 134,871 so that 96.3% were nursed by the regular staff, and 3.7% by special nurses. We know that we require at least 4.7 hours of nursing per patient in 24 hours, and we have averaged from 3.5 to 4.5 during this year.

Thirty-five graduate students from Canada, the United States and other countries and 54 undergraduate students from the Royal Victoria Hospital have been given instruction and experience. With one full time Instructor it is obvious that a considerable amount of teaching and supervision is required of all members of the staff — this is good experience for them for they have to cope with many inquiring minds!

We have just published an attractive folder for the Graduate Course which I hope will assist in the continual attraction of nurses seriously interested in the nursing of neurological and neurosurgical patients. This is the best way of assuring an interested and trained staff. Again, I would like to stress the need for some endowment funds for this purpose.

The problem of housing must also be considered very soon. We require another residence to house about 15 nurses.

We have again to thank the Women's Auxiliary for a gift towards furnishing the nurses' quarters and for the great help the Coffee Shop is for patients' relatives and the staff.

The Graduate Society has been very active, sending children to camp, sending Christmas hampers and arranging social events for the staff.

As always we are indebted to the medical staff for many hours of teaching and help in countless ways.

I would like to express my thanks to every member of the nursing staff for their loyal and devoted service to the patients, sometimes under very exacting conditions.

*Read by Miss Bertha Cameron.

DEPARTMENT OF SOCIAL SERVICE

MISS JOYCE BEATTY

A review of my annual reports of the last 3 years indicates that one of our major problems has been — planning for the chronically ill. This has been complicated by the lack of good nursing homes and chronic care facilities.

I will not dwell on this problem again, although, to some extent it is still with us. Instead, allow me to speak of a more encouraging, hopeful development. In the annual reports which the social workers prepared on their respective services, it was striking that the key word in each report was — rehabilitation. More patients were referred to social service for rehabilitation than for any other reason. More patients, as a result of rehabilitation services, were able to go home, rather than to nursing homes or institutions. What do we mean by rehabilitation? I think of it as a restoration of the patient to maximum function and usefulness within the limits of his condition. But, you may ask, isn't this the aim of good medical care, I believe it is, and that is why we are all part of a rehabilitation team, which includes, in addition to hospital and rehabilitation centres, many agencies in the community, the patient, his family and friends.

This process requires the utmost in cooperation. The hospital must become a community agency, and the community agency a unit of broad medical treatment. As you can imagine, this is infinitely more complicated than simply discharging a patient to a nursing home. And yet, in terms of the patient's well-being and the gain to the community, I submit that our time, money and professional care is much better spent in this manner. Mrs. J., the tumour patient, could have gone to a nursing home on discharge, but instead she went to a rehabilitation centre, and in several weeks was able to return home and help in caring for her 3 children. Mr. M., a severe accident case, could have been sent home to manage as best he could, but he was given the benefit of V.O.N. follow-up and later treatment at a centre on an out-patient basis. He is now learning a new trade. Little Mary, who was hit by a car, could have been treated, discharged and forgotten, instead, as part of a rehabilitation plan, she was followed closely after discharge and at the opportune time arrangements were made for her to enter the School for Crippled Children. Even at seizure clinic, an area of our work financed by the Dominion-Provincial Grant, we find the emphasis on the rehabilitation of the seizure patient.

Let me point out, however, that the road of rehabilitation is not easy for either the patient or the staff. It is fraught with discouragements and disappointments, as well as accomplishments and successes. It requires a great deal of understanding of the patient, his family and the community. It necessitates the utmost cooperation on the part of many people. I make no apologies for the fact that our department, during this past year, has spent so much of its time on rehabilitation. But rather, I am proud of this.

I would like to acknowledge the splendid service of the rehabilitation centres and the other community agencies. When I speak of the many people involved in helping the patient, I refer, also, to a broader group of people, not ordinarily thought of as members of our team. Our own Women's Auxiliary, whose

assistance we so greatly appreciate, by their interest, support and understanding, play an important role in the work of this hospital and in the rehabilitation of the patient. The very able volunteers who help in our clinics, the members of the Cancer Aid League, the MS Bowling League and Golf League, and the various other groups who give their money to be used in helping patients are certainly our teammates. To all of them, as well as to our doctors, nurses and other hospital staff, I extend my sincere appreciation for their cooperation, and express the hope that we will continue to work toward the restoration of as many patients as possible, to maximum function and usefulness.

DEPARTMENT OF ANAESTHESIA

DR. R. G. B. GILBERT

There have been a number of changes in the Department during the past year. Dr. R. A. Millar arrived from Philadelphia to fill the vacancy left by Dr. A. F. Pasquet. Dr. Robert Bethune retired from our staff and was replaced by Dr. G. F. Brindle. Research Professor in Anaesthesia, Dr. Gordon Robson, was appointed to the staff.

With the addition of Drs. Millar and Robson the research side of the Department has been strengthened; in this field the blood levels of pressor amines and the circulatory effects of various drugs have received special attention.

A total of 910 cases were anaesthetized for major neurosurgical procedures and X-Ray examinations. Clinical work appeared satisfactory with new techniques and new drugs being used and investigated.

Four residents were appointed on rotation from the McGill Diploma Course who received clinical and academical instruction. Members of the staff took part in the overall teaching at McGill and within the Institute.

Members of the Department are grateful for new equipment which they have received and additions to its library, which latter has proved to be very popular as witness by the fact that 6 books have failed to return to their base.

DEPARTMENT OF RADIOLOGY

DR. DONALD McRAE

Radiological methods of examination demonstrate anatomical, pathological, and physiological facts in the intact patient which in most cases cannot be disclosed by other methods of examination. The appreciation that a radiological examination is a fact-finding procedure and not "tests" to confirm or deny a certain diagnosis has led to increased utilization of radiological methods in all branches of medicine. This Institute is no exception. The work of the Department of Radiology increased by 9% over the previous year. A total of 8,779 examinations were carried out. There were 772 encephalograms, 148 ventriculograms, 169 cerebral arteriograms, 397 opaque myelograms.

The increased work done in this department has accentuated a chronic shortage of X-Ray technicians. Five well-qualified X-Ray technicians are necessary for the efficient functioning of the department during regular working hours and to take care of the emergency cases who must be examined at night and on week-ends and holidays. Night and week-end duty make hospital work less attractive than other types of work. The fact that hospital salaries are lower than salaries in business and government also makes hospital work less desirable. The recent publicity about potential harmful effects of radiation has cut down the number of X-Ray workers. The satisfaction of a lifetime of service will compensate some people for the longer hours, the lower pay and the hazards mentioned above. It will not compensate all people however, therefore qualified hospital X-Ray technicians are hard to find. The situation will get worse since smaller numbers of student X-Ray technicians are appearing, yet the demand for X-Ray technicians is increasing.

During the year, Doctors A. Tamas, Tok Liem, and D. Sproul, served as Residents in Radiology. All were members of the Diploma Course in Radiology of McGill University. Dr. Arnold Berrett, of South Africa, James Picker Fellow in Radiological Research, completed the follow-up of all of our patients who had received Thorotrast in the past. He was succeeded by Dr. Vincenzo Valentino, of Naples, who is carrying out a clinical, pathological and radiological study of lesions of the brain which mimic brain tumours. The study of the cerebellar astrocytomas and medulloblastomas has been completed with the aid of a James Picker Foundation grant for Radiological Research. Three other doctors spent shorter periods as observers in the Department.

The weekly colloquia in Neuroradiology were given each Monday morning as in the past. These colloquia have been held continually for 20 years with minor interruptions during the war years. The bi-weekly case presentations with the Neurologists were also continued. The annual Neuroradiological Seminar was given as usual.

DEPARTMENT OF NEUROCHEMISTRY

DR. K. A. C. ELLIOTT

Year after year the report from this department has recorded increases in the amount of work done. The increase in 1956 was, however, beyond all previous experience. The total number of procedures carried out in the two divisions was 24,065 — 14,909 in the ward laboratory, an increase of 96% over last year, and 9,156 in the Neurochemistry laboratory, an increase of 25%. Besides these procedures 4,164 blood samples were taken for analyses here and in other laboratories, an increase of 74%, and 5,373 liters of irrigation solution were prepared for the operating rooms.

We were fortunate in suffering no change in the technician staff of these laboratories during the year. Dr. Pappius has continued to supervise technical aspects of the work, and Dr. Heller has now taken over general supervision of these laboratories.

DONNER LABORATORY OF EXPERIMENTAL NEUROCHEMISTRY

DR. K. A. C. ELLIOTT

The laboratory passed through a rather exciting period during the early part of last summer and then, with the departure of the Floreys, Alva Bazemore and Michael Rosenfeld, settled down to quieter but still very interesting work. Since the last report Dr. Ernst Florey has shown, among other things, that two drugs which are convulsants to the crayfish prevent the inhibitory effect of Factor I on the crayfish stretch receptor neurone. Dr. Bazemore with Dr. Florey succeeded in isolating, from brain, crystals of material with the highest Factor I activity yet encountered and identified these as gamma-aminobutyric acid. Mr. Nico van Gelder has since carried on *in vitro* studies of the metabolism of gamma-aminobutyric acid and has found that it is not rapidly destroyed by brain tissue, as might have been expected for a possible transmitter substance, but the free active substance is strongly absorbed from the surrounding medium by brain slices and stored in the occluded form. This absorption does not occur with other kinds of tissue nor with disintegrated brain.

Under Dr. Jasper's direction the Neurophysiology Department has joined very productively in the study of the action of gamma-aminobutyric acid. Dr. K. Iwama has shown marked, reversible, effects of topical application of the substance on the electrical activity of superficial layers of the cerebral cortex of cats. With the assistance of Dr. Tsai and of Drs. Gilbert and Millar, it has been noted that various animals tolerate, after a curious initial reaction, very large intravenous doses of gamma-aminobutyric acid. From tests by Mr. Van Gelder it appears that, though large concentrations of the substance can be produced in the blood, detectable amounts do not reach the cerebrospinal fluid.

We are most grateful to Merck, Sharp & Dohme Research Laboratories for financial aid and to members of the staff at that organization for very helpful cooperation in the work on Factor I and gamma-aminobutyric acid.

Dr. Pappius has undertaken a careful re-examination of work previously carried out in this laboratory on the acetylcholine metabolism in epileptic patients and in normal and anaesthetized animals. She has also nearly completed a study, started by Michael Rosenfeld, of the metabolism of brain tissue in sodium-free media, which has provided interesting confirmation of the "sodium-pump" theory and given some new information on factors affecting glycolysis.

Dr. Irving Heller is studying the oxidative metabolism of mammalian peripheral nerve in preparation for research on the biochemistry of peripheral neuropathies.

Drs. Ernst and Elizabeth Florey, after a very fruitful two years with us, left in September for Seattle to work in the Department of Zoology, University of Washington, where they are, we are sure, continuing to make fascinating observations. Dr. Basemore, after his notable achievement here, returned to his home laboratory at Merck, Sharp and Dohme Research Laboratories. Mr. Michael

Rosenfeld, having obtained an M.Sc. degree, left in the fall to enter the study of medicine. He is expected back for summer work. Mr. Nico van Gelder joined the laboratory in the fall as a Ph.D. student. Dr. Dorothy Johnson has joined us on a part-time basis and is working with Dr. Pappius.

DEPARTMENT OF ELECTROENCEPHALOGRAPHY

DR. HERBERT H. JASPER

DR. PIERRE GLOOR

The work of this laboratory has increased again during the past year with a total of 2,766 E.E.G. examinations carried out on 2,358 patients. There were 1,712 examinations of patients admitted to the Neurological Institute and 1,054 outpatients referred from clinics and private offices. The accomplishment of this large number of examinations, without sacrificing thoroughness of study (many examinations requiring two hours to complete) was possible by the efficient management of Lewis Henderson and Lili Prisko with the excellent assistance of Shirley Tannenhaus as well as other technicians in training.

In addition to these EEG examinations, there were 64 cortical electrograms carried out in the operating room as a guide to surgical treatment of patients with focal seizures. In addition these studies provide us with most valuable data for the better understanding of neurophysiological mechanisms underlying cortical electrical activity and epileptic discharge. Together with the weekly conferences with Drs. Penfield, Rasmussen, McNaughton, McRae and Roberts, these studies of epileptic patients are continuing to provide most thought provoking discussions giving renewed insight into the functional anatomy and physiology of the human brain.

In electromyography, Dr. Numoto has carried out detailed studies on 125 patients with neuromuscular, cord, or nerve lesions in addition to experimental studies of spinal reflex mechanisms in man, with the help of a grant from the Cerebral Palsy Association.

Dr. Lever Stewart completed his fellowship training and succeeded in passing the U.S. Qualifications examination as well as his Master's thesis and departed for further studies at the National Hospital, Queen Square. Other fellows in training were Dr. Caldaroni and Dr. Bicci Ricci.

During the winter, we entertained members of the Eastern Association of Electroencephalographers at the Annual Scientific Ski Week-End at St. Adele. The Symposium on depth recording, as well as other papers, were of particular training were Dr. R. Calderon Reyes and Dr. Bice Ricci.

Mention should be made also of the publication of the International Journal *Electroencephalography and Clinical Neurophysiology* with editorial and business offices in these laboratories. Drs. Jasper and Gloor, with business management by Mrs. L. Denton, assisted by Mrs. Jasper, have supervised the growth of this Journal until it now has over 2,400 subscribers on this continent and from distant parts of the world. It is the official organ of the International Federation of Societies for Electroencephalography and Clinical Neurophysiology, incorporated under the auspices of UNESCO.

DEPARTMENT OF NEUROPHYSIOLOGY

DR. HERBERT JASPER

DR. ROBERT MARTIN

The work of this department during the past year can be grouped under three main headings: experimental surgery, experimental psychology and basic neurophysiology. There were 22 fellows and staff participating in these investigations. The most important projects were as follows:

The effect of hypothermia upon brain lesions due to vascular occlusion.

Analysis of methods for the prevention of vascular spasm and vessel damage during surgical excision of the temporal lobe.

A study of methods for the temporary reversible paralysis of areas of cerebral cortex.

Microelectrode analysis of neurophysiological mechanisms in the formation of conditioned responses in the monkey. (Supported by a grant from the National Science Foundation of the United States to Profs. Hebb and Jasper).

The effects of bilateral excision of the rhinencephalic portions of the temporal lobes upon behaviour and discriminative learning in monkeys.

Studies of area of contact in relation to current and voltage in determining thresholds of electrical excitation in the motor cortex of the cat.

Further study of electrical constants of mammalian muscle fibre membranes.

Microelectrode studies of the electrical activity of slices of cerebral cortex in vitro.

Intracellular and extracellular microelectrode studies of excitatory and inhibitory processes in motor cortex, with special reference to thalamic afferents to pyramidal cells.

Microelectrode studies of epileptic discharge in single cells of cerebral cortex in cat and monkey.

Microphysiological analysis of mechanisms of excitation and epileptic discharge in rhinencephalic portions of the temporal lobe in relation to temporal lobe epilepsy. (Supported by a Federal-Provincial Mental Health Department Grant).

Drs. Rasmussen, Henderson, Zervas, and Lende* with the help of Dr. Gilbert and his department. (*Fellow of U.S. National Foundation for Infantile Paralysis).

Dr. Lende under the direction of Dr. Penfield.

Dr. Brichetti.

Drs. Ricci, Doane and Jasper.

Drs. Orbach*, Rasmussen and Milner. (*Fellow of the NRC of the United States.)

Dr. Robert Martin and Dr. Ralph Lewis.

Dr. Robert Martin.

Drs. Martin and Elliott.

Drs. Martin and Branch*. (*Fellow of the United States Public Health Service).

Dr. Rayport*. (Fellow of United States National Institute of Health).

Dr. Pierre Gloor.

Microelectrode studies of corticofugal projections to the thalamus and brain stem reticular formation.

Drs. Wada and Gauthier'. (Fellow of the Provincial Department of Health.)

Studies of the effects of γ -aminobutyric acid upon the electrical activity and response of the cerebral cortex in the cat (with the assistance of Merck Inc.)

Drs. Iwama, Jasper and Elliott.

Electrophysiological studies of connections between the thalamus and fornix with the temporal lobe.

Drs. Jasper and Orbach.

Electrophysiological studies of spinal reflexes in man.

Dr. M. Numoto. (Fellow of the United States National Paraplegia Association).

The rapid turnover of relatively inexperienced fellows together with the ever increasing complexity of modern neurophysiological techniques makes it imperative that we maintain on the permanent staff of this department full time men of high competence and training to keep up the standards of graduate teaching and research. Since the attack on problems of neurophysiology are being made on a broad front, from studies of the neurochemical mechanisms in single cells and synapses to neuronal mechanisms underlying emotional behaviour, consciousness, attention, and learning, the work of this department is a real challenge to those responsible for its direction.

DEPARTMENT OF NEUROSURGICAL PATHOLOGY

DR. WILLIAM V. CONE

DR. GILLES BERTRAND

The work in the Neurosurgical Pathological Laboratory was varied and active. Specimens obtained at operation and autopsy material from surgical cases kept the Fellows busy. There were 544 surgical specimens and 80 autopsies. Nine specimens were sent in from outside sources for an opinion.

Dr. Ellis B. Keener finished his year as Senior Fellow in the Neurosurgical Pathology Laboratory in July, 1956. As Junior Pathology Fellow with him there was Dr. Victor Kleider and Dr. Nicholas B. Zervas. Drs. Kleider and Zervas spent 6 months each in the laboratory. Dr. Purvis S. Henderson worked as a voluntary Fellow during part of this period.

Dr. Warren T. Sights took over as Senior Fellow in July 1956. Dr. Richard A. Lende has worked as Junior Fellow during the first 6 months, and Dr. Jack Litvak during the second 6 months. Dr. Y. B. Kim and Dr. C. J. Shih worked as voluntary Fellows.

Many blind spots in the field of neurosurgical pathology are disclosed in the routine work. Each one of the Fellows has tried to throw light on some one of them during his period in the laboratory. Then too there are the problems brought to the laboratory from the clinical work on the wards. So many of the problems need the help of other laboratories and we are grateful to Dr. Elliott in Neurochemistry, Dr. Jasper in Neurophysiology and Electroencephalography, and Dr. McRae in Neuroradiology for much help.

As in the past and for many years now we are grateful to Mr. Charles Hodge for the excellent photographs which illustrate our neurosurgical pathological lesions and help to make our reports outstanding ones.

The library of 35mm. Kodachrome films of microscopic preparations has been added to considerably this past year by Dr. Sights. The staff and Fellows have used the slides freely and it is hoped that they will be guarded and the files kept intact.

DEPARTMENT OF NEUROANATOMY AND MEDICAL NEUROPATHOLOGY

DR. FRANCIS MCNAUGHTON

The Department of Neuroanatomy took part in the teaching of the undergraduate course in Neuroanatomy to the second year class during the fall term and the Neuropathology course to the third year class during the spring term.

The neuropathological material available from 532 autopsies gathered from examinations performed at the Pathological Institute of McGill University and representing cases gathered from the Royal Victoria, Verdun Protestant, Royal Alexandra, Grace Dart, Royal Edward Laurentian Hospitals and the Jewish Hospital of Hope, were studied both grossly and microscopically in association with instruction in neuropathology to the resident staff of the Pathological Institute of McGill University. In addition, 27 cases coming to autopsy from the Neurological Services of the Montreal Neurological Institute were studied and reported in detail. Eight cases sent to the department on a consultative basis also were given detailed attention. Approximately half of the technical work of the laboratory consisted of preparation of serial sections from experimental animals.

Mr. Reford continued his work in plastic embedded sections, completing 45 specimens during the year.

Dr. E. Ramon Moliner completed work on modifications of the Golgi and Golgi-Cox methods and is continuing his studies on the problem of transitional forms between oligodendroglia and neuroglia and of the histological structure of the postcentral gyrus in the cat. Dr. Lieselotte Gerhard completed a study of gross anatomy in brains of experimental animals and is completing a study of cyto- and myelo-architecture of the brain stem in primates. Dr. John Pace is studying the localization of the XIth cranial nerve in man and the macaca mulatta.

TUMOUR REGISTRY

DR. ARTHUR R. ELVIDGE

The continual follow-up study of patients with tumours of the central nervous system will lead progressively toward the most adequate type of treatment. The problem of the surgical approach and the question of the effect of roentgenotherapy and other forms of treatment in any particular subtype of growth must eventually be judged on the basis of follow-up material. More and more

cases of long survival are being discovered. This time-consuming work has been carried on by the secretary, Mrs. Schultz, who has been very diligent and conscientious. Due to a change of domicile she will be succeeded by Mrs. Smith, from the Royal Victoria Registry, who has had considerable experience in this work.

During the year 176 new patients and 119 re-admissions have been added to the list for initial and continued follow-up study. The new patients show an increase of 10% over 1955.

The Registry follow-up material is 93.4% complete from 1950 to 1956, inclusive, and will obviously increase in value as time passes. It is complete from 1928, for certain tumour categories. This is due largely to the help of Fellows who have been engaged on special problems.

The Registry has been fortunate to have, as Fellow, Dr. Emil Berger, to assist in the routine work. Dr. Berger has also engaged in an investigation of the medulloblastoma group of tumours. Dr. John Roth continues to work on the problem of the glioblastoma multiforme. The follow-up analysis of the astrocytomas carried out in detail by Drs. Martinez-Coll and Laurence Levy, has been published.

Adequate survey work depends on close cooperation with the staff of the Social Service Department. In this way, not only information of research value is obtained, but the patient benefits through facilitation of treatment and rehabilitation.

REPORT ON NEUROPHOTOGRAPHY

DR. GILLES BERTRAND

The Department of Neurophotography has completed another successful year. There was an increase in the number of operating room photographs due to the new 35 mm. colour setup. The usual volume of clinical photographs of patients, photographs of pathology specimens and photomicrographs were carried out as in other years.

The department has contributed more colour photo displays in the Pathological Museum on the 6th floor. Filling these display cabinets will be a long, slow process as the department can only do this work in spare time.

Again this year, several thousand feet of movies were taken by the Photography Department for various individuals on the staff. There remains a great need for someone on the staff to take an active interest in the production and completion of clinical and research movies.

This year Mr. Hodge completed an evening course in motion picture and television production and attended the convention of the Biological Photographers' Association in Rochester, New York.

THE FELLOWS' LIBRARY

DR. D. LLOYD-SMITH

The past year has seen further growth in the Library. New volumes have been added, and the total collection of approximately 3,000 volumes has been reclassified. In addition, new furniture, lighting and draperies have been added, improving the appearance and comfort. Several new entries have been made in the Journals section of the Library. Supervision of the 4 subordinate sectional libraries has been continued. The Historical section has received further generous gifts from the collection of Dr. Wilder Penfield, including the Proceedings of the Royal Society of Medicine from 1950 to date. Dr. Ludo von Bogaert has graciously contributed the complete series of bound volumes of reprints from L'Institut Bunge, Belgium. Dr. K. A. C. Elliott generously contributed his Collected Reprints, 1950-56.

We also acknowledge with thanks donations to the Library from the following: Dr. H. H. Jasper, Dr. T. Rasmussen, Dr. L. Roberts, Dr. Francis McNaughton and Dr. D. Lloyd-Smith. The Library is deeply grateful to Dr. Jasper for the donation of subscriptions to 26 Journals through exchange arrangements with the Journal of Electroencephalography and Clinical Neurophysiology. This constitutes a most important supplement to the Library's regular subscriptions of about 50 Journals.

Acknowledgement is made of the untiring efforts of the librarian, Mrs. Casselman for her assistance in the reorganization and in all aspects of the library work.

The demand for new additions to the Library greatly exceeds the supply, due to budget restrictions. Increased financial support is urgently needed.

THE MONTREAL NEUROLOGICAL SOCIETY

<i>President</i>	DR. W. F. T. TATLOW
<i>Vice-President</i>	DR. J. DESROCHERS
<i>Secretary-Treasurer</i>	DR. J. B. R. COSGROVE

Twenty-nine meetings of the section of neurology of the Montreal Medico-Chirurgical Society were held weekly from October 3rd, 1956 to May 15th, 1957.

A special feature of this session was a Memorial Meeting in honour of the late Dr. Colin K. Russel under the chairmanship of Dr. W. Penfield. Dr. W. W. Francis, Curator of the Osler Library, and Dr. F. L. McNaughton addressed the meeting. The tributes expressed at this meeting will be published in the Canadian Medical Association Journal.

This year clinical meetings were held at Notre Dame Hospital, the Hotel Dieu, the Montreal General Hospital and the Montreal Neurological Institute. In addition, the society renewed its association with the Montreal Children's Hospital by holding a clinical meeting in the new hospital. It is planned to continue this association during the coming year.

Two special meetings were held. One in conjunction with the Department of Psychology of McGill University at which Dr. Minkowski spoke on "Aphasia in Polyglots", and one in conjunction with the Montreal Physiological Society which was addressed by Dr. Zotterman of Stockholm, Sweden on "Neurophysiological Investigations of Taste".

Papers read before the Society by distinguished visitors and local colleagues were as follows:

- DR. H. FISCHGOLD, Electro-Radiologiste des Hôpitaux de Paris, France: "Les Recherches Récentes sur l'Epilepsie du Type Petit Mal".
- DR. C. WESLEY WATSON, Tufts University School of Medicine, New England Center Hospital, Boston, Mass.: "Hereditary Light-Sensitive Epilepsy".
- DR. CARL DECKER, University of Munich, Germany: Film on "Cineradiography for Pneumoencephalography" and short paper on "Angiography of the Internal Carotid Artery of the Neck".
- SIR GEOFFREY KEYNES, St. Bartholomew's Hospital, London, England: "The Thymus and Myasthenia Gravis and Thymectomy".
- DR. R. A. LENDE, The Montreal Neurological Institute: "Spasm of Cerebral Arteries: A Clinical and Pathological Study".
- DR. HELMER MYKLEBUST, Professor of Otolaryngology, Northwestern University, Chicago, Ill.: "Language Disorders in Children".
- DR. J. B. R. COSGROVE, The Montreal Neurological Institute: "Cerebrospinal Fluid Gamma Globulin in Various Neurological Disorders".
- DR. C. MILLER-FISHER, Massachusetts General Hospital, Boston, Mass.: "Results of Anticoagulant Therapy in Cerebral Thrombosis".
- DR. JOHN PRITCHARD and DR. ANDREW SASS-KORTZAK, Research Institute, Sick Children's Hospital, Toronto, Ont. "Some Metabolic Causes of Neurological Signs and Symptoms in Children and Adults".
- PROFESSOR HENRI GASTAUT, University of Marseilles, France: "Differentiation of Anoxic Hypertonic Seizures from Generalized Epileptic Seizures in Adults and Children".
- DR. DAVID INGVAR, Institute of Physiology, Lund, Sweden: "Cortical Excitatory State and Cortical Circulation".
- DR. ROLAND MACKAY and MR. MYRIANTHOPOULOS, Chicago, Ill.: "Clinical and Genetic Studies in Multiple Sclerosis with Analysis of Seventy-four Pairs of Twins and their Relatives".
- MR. RICHARD JOHNSON, F.R.S.C., The Manchester Royal Infirmary, England: "The Anatomy of Hydrocephalus which Deals with Structural Changes at the Tentorium with Observations at this Level".

DR. HERBERT S. GASSER, Fellow and Former Director, The Rockefeller Institute for Medical Research (Twenty-Second Annual Hughlings Jackson Lecture): "The Properties of Unmyelinated Nerve Fibers with Afferent Function".

Officers elected for the coming year were:

President: DR. A. R. ELVIDGE
Vice-President: DR. GUY COURTOIS
Secretary-Treasurer: DR. J. B. R. COSGROVE

THE FELLOWS' SOCIETY

DR. CHARLES L. BRANCH, *President*
DR. RICHARD A. LENDE, *Vice-President*
DR. A. R. MARTIN, *Secretary*

This has been an active year for the Fellows' Society. Its 37 members have collaborated with the Wives' Club in sponsoring a Folk Dance in the autumn and a Travel Night with Dr. Elvidge in the spring. During the winter months a Ski Hut in the Laurentians for M. N. I. Medical, Nursing, and Technical Staff was also sponsored by the Society. The Annual Fellows' Society dinner was held at the Nanking Restaurant after which farewell gifts were presented to the departing Fellows.

Several informal scientific sessions were held. Visiting speakers for these occasions included Professor Julian Huxley, Dr. Wesley Watson, Dr. Helmer Myklebust, Dr. David Ingvar, and Mr. Richard Johnson.

The biggest event of the year was the First Annual Fellows' Society Lecture-ship held in conjunction with the Fellows' Reunion on April 29th, 1957. Professor Joseph P. Evans was the speaker. His subject was "Brain Injury: Present Concepts and Challenges". The second annual Fellows' Newsletter was published and sent to M. N. I. Fellows around the world.

CLINICAL APPOINTMENTS AND FELLOWSHIPS*

Appointments to the Resident Staff in Neurology or Neurosurgery are made for January 1st or July 1st. All candidates are expected to have 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 Professor Rasmussen and the Chief of the laboratory in question. Research stipends are available for the following Fellowships.

Senior Fellowship in Neuropathology — twelve months' duration — available July 1st.

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

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

Fellowship in Neuroanatomy — six to 12 months' duration — available January 1st and July 1st.

The Diploma in Neurosurgery, McGill University, requires at least four years 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 INSTRUCTION

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 arrangements.

A. SEMINAR IN NEUROANATOMY, M.N.I.

1. This course is given in combination with Course Med. 2A "Anatomy and Physiology of the Central Nervous System", September to end of November.

Additional graduate seminars will be held coordinated with Course B. Graduate students are expected to pass the same examination which is given in undergraduate course Med. 2A, but with higher standing.

Professor McNaughton

2. Advanced Neuroanatomy for selected group; brain modelling, beginning in January; time to be arranged.

Professor McNaughton

B. SEMINAR IN NEUROPHYSIOLOGY.

This course is given in two parts, (1) lectures and examination together with undergraduate course Med. 2A "Anatomy and Physiology of the Central Nervous System", and (2) weekly graduate seminars and demonstrations coordinated with Course A (4 months, beginning in December), Mondays, 4:30 to 6:00 p.m.

Professor Jasper

C. COLLOQUIUM IN CLINICAL NEUROLOGY.

1 hour weekly, clinics and lectures, Wednesdays, 5:00 p.m. M.N.I. (9 months).

1 hour weekly, clinics and lectures, Wednesdays, 5 p.m. M.N.I. (9 months).
Staff and Visiting Lecturers

D. SEIZURE MECHANISMS AND CEREBRAL LOCALISATION: Neurosurgical, Electroencephalographic, and Roentgenographic Conference.

M.N.I. 1½ hours weekly (9 months).

Professors Penfield, Rasmussen, Jasper, McNaughton and McRae

E. OUTLINE OF NEUROCHEMISTRY.

Lectures and demonstrations, M.N.I. (2 months, beginning in April), Mondays, 4:30 to 6:00 p.m.

F. CONFERENCE IN NEUROSURGICAL PATHOLOGY.

Gross and Microscopic demonstrations to be supplemented by collateral work (9 months), Fridays, 5:00 to 6:00 p.m.

G. DEMONSTRATIONS IN MEDICAL NEUROPATHOLOGY.

1 hour weekly (9 months), time to be arranged.

Dr. Mathieson

Graduate credit is given for either:

(a) Acting for a period of 6 months as neuropathological fellow in the laboratory of surgical neuropathology. Arrangements should be made well in advance with Dr. Cone.

(b) Acting for a period of 6 months as neuropathological fellow in the laboratory of medical neuropathology. Arrangements should be made well in advance with Dr. Mathieson.

(c) Passing written and practical examination in neuropathology.

H. CLINICAL NEUROPATHOLOGICAL CONFERENCE.

1 hour, every other Thursday, 5:00 p.m. (9 months).

I. SEMINAR IN NEUROLOGICAL RADIOLOGY.

1. Didactic lectures (3 months, beginning in September), Monday, 4:30 to 6:00 p.m.

2. Colloquium, 1 hour weekly (9 months), Mondays, 9:00 a.m.

Professor McRae

PUBLICATIONS

1956-57

GILLES BERTRAND:

Spinal Efferent Pathways from the Supplementary Motor Area. Brain 79: 461-473, 1956.

Cirroid Aneurysm of the Orbit. Tr. Canad. Opth. Soc. 7: 248-260, 1956 (with A. H. Katz).

G. F. BRINDLE:

Observations of Carbon Dioxide in Conscious and Anaesthetized Subjects Using the Liston-Becker Infra-Red Analyses. Canad. Anaesth. Soc. J. 3: 81-96, 1956 (with W. G. Cullen and H. R. Griffith).

K. A. C. ELLIOTT:

Factor I and γ -Aminobutyric Acid. Nature 178: 1052-1053, 1956 (with A. Bazemore and E. Florey).

Factor I — Inhibitory Factor from Brain. J. Neurochem. 1: 181-191, 1956 (with E. Florey).

See Hanna Pappius, joint author.

ARTHUR ELVIDGE:

Astrocytoma of the Brain and Spinal Cord. J. Neurosurg. 13: 413-443, 1956 (with L. F. Levy).

Long-Term Follow-Up of 106 Cases of Astrocytoma, 1928-1939. J. Neurosurg. 13: 230-243, 1956 (with A. Martinez-Coll).

ERNST FLOREY:

The Action of Factor I in Certain Invertebrate Organs. Canad. J. Biochem. 34: 669-681, 1956.

Chemical Transmission and Adaptation. J. Gen. Psychol. 40: 533-545, 1957.

See K. A. C. Elliott, joint author.

R. G. B. GILBERT:

Chlorpromazine, Review and Investigation as a Premedication in Anaesthesia. Anesthesiology 17: 135-164, 1956 (with A. B. Dobkin and K. I. Melville).

PIERRE GLOOR:

Telencephalic Influences Upon the Hypothalamus. Chapter for book, *Hypothalamic-Hypophysial Interrelationships*, W. S. Fields, Editor, p. 74-113. Springfield, Ill., Thomas, 1956.

The Pattern of Conduction of Amygdaloid Seizure Discharge. A.M.A. Arch. Neurol. & Psychiat. 77: 247-258, 1957.

Microelectrode Analysis of Sensitivity and Potentiation Occurring in Hippocampal Neurones in Response to Amygdaloid Stimulation. Abstr. Communications XXth Internat. Cong. Physiol., p. 349-350, Brussels, 1956.

JOHN HANBERY:

The Pathology, Diagnosis and Treatment of Intravenous Aneurysms. Stanford M. Bull. 13: 317-341, 1955.

DAVID HOWELL:

Prolonged Hypothermia in the Treatment of Cerebral Haemorrhage. Canad. M.A.J. 75: 388-394, 1956 (with J. G. Stratford and J. Posnikoff).

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CLASSIFICATION OF DISEASES

Nervous System Generally:

Neurosyphilis	10
Multiple Sclerosis	82
Motor Neurone Disease	47

Meninges:

Meningocele and Myelomeningocele	13
Acute Purulent Meningitis	17
Tuberculous Meningitis	2
Headache	51
Subdural Haematoma	29
Subdural Hygroma	8
Epidural Haematoma	3
Subarachnoid Haemorrhage	21
Miscellaneous	6

Brain:

Congenital Anomalies	24
Hydrocephalus	27
Brain Abscess	3
Cerebral Concussion	104
Cerebral Contusion, Laceration, Traumatic Encephalopathy	71
Epilepsy	478
Migraine	43
Parkinsonism	18
Cerebral Thrombosis, Encephalopathy due to Arteriosclerosis	146
Cerebral Haemorrhage	21
Cerebral Embolism	3
Intracranial Aneurysm	42
Encephalitis	13
Miscellaneous	28

Tumours:

Gliomas	112
Perineurial Fibroblastoma	10
Meningeal Fibroblastoma	26
Pituitary Adenoma	11
Craniopharyngioma	3
Ependymoma	4
Angioma	6
Miscellaneous CNS and Skull	22
Secondary Tumours, Brain and Spinal Cord	28
Miscellaneous Tumours, Body Generally	30

Spinal Cord:

Compression of the Spinal Cord	22
Acute Myelitis	13
Guillain Barré Syndrome	8
Myelopathy, Cause Unknown	34
Syringomyelia	1
Miscellaneous	7

Cranial and Peripheral Nerves:

Optic Neuritis	15
Trigeminal Neuralgia	63
Bell's Palsy	6
Meniere's Syndrome	18
Cervical Rib Syndrome	1
Traumatic Peripheral Nerve Lesions	19
Other Neuralgias	4
Peripheral Neuropathy	16
Miscellaneous	10

Muscles:

Myasthenia Gravis	9
Miscellaneous	12

Mental Diseases:

Mental Deficiency	5
Schizophrenia	5
Depression	22
Drug Addiction	3
Psychoneurosis	60
Organic Psychosis	17

Other Systems:

Occipitalization of Atlas	1
Congenital Anomalies of Spine	12
Congenital Anomalies of Skull	3
Protrusion Disc Cervical	47
Lumbar	278
Fracture and/or Dislocation Vertebral Column	19
Fracture Skull	119
Back Pain	41
Intractable Pain	1
Facial Pain	10
Miscellaneous Traumatic Lesions and Infections	15
Arthritis of Spine	4
Miscellaneous and Undiagnosed	58

CLASSIFICATION OF OPERATIONS

Craniotomy (Osteoplastic, miscellaneous, etc.)

Hemispherectomy	4
and Biopsy	2
and Decompression	2
and Drainage of Abscess	2
and Drainage of Subdural Haematoma	20
and Drainage of Intracerebral Haematoma	7
and Drainage of Extradural Haematoma	5
and Excision of Epileptogenic Area of Brain	36
and Excision of Aneurysm	5
and Exploration	12
and Hypophysectomy	13
and Incision and Drainage of Cyst	1
and Obliteration of Aneurysm	5
and Obliteration of Cyst	6

and Plastic Repair of Dura	2
and Removal of Tumour	100
and Rhizotomy	7
and Sinusectomy	2
and Sinusotomy	1
and Lobectomy	19
Trepanations or Craniocentesis	5
and Aspiration of Cyst	1
and Biopsy	10
and Drainage of Subdural Space	10
and Placement of Electrodes	1
and Drainage of Abscess	1
and Ventriculography	10
and Exploration	3
and Sinogram	3
Elevation of Depressed Skull Fracture	39
Plastic Repair of Skull Defect, Tantalum	1
Plastic Repair of Skull Defect, Bone	3
Suture of Lacerated Wound of Scalp	2
Ventriculocisternostomy (Torkildsen's)	3
Laminectomy or Hemilaminectomy	
and Anterolateral Cordotomy	8
and Biopsy	1
and Decompression of Spinal Cord	7
and Exploration	12
and Incision and Drainage Intramedullar Cyst	1
and Removal of Tumour	10
and Spinal Fusion with Bone Craft	22
and Spinal Fusion with No. 18 Wire	8
and Discoidectomy	154
and Cervical Discoidectomy	16
and Cervical Occipital Fusion	3
Sympathectomy — Anterospinal Rhizotomy	1
Plastic Repair of Cranium Bifidum	3
Plastic Repair of Spina Bifida	6
Nerve Avulsion	9
Ligation of Artery	9
Exploration of Nerve	3
Ligation of Artery with Selverstone Clamp	10
Removal of Neuroma	2
Nerve Suture	4
Re-opening of Wound with Evacuation	8
Re-opening of Wound with Exploration	3
Re-opening of Wound with Removal of Bone Flap	5
Re-opening of Wound and Repacking	4
Re-opening of Wound with Drainage of Infection	1
Resuturing of Wound	6
Section of Scalenus Anticus Muscle	1
Miscellaneous	53
Plaster Cast	37
Ventriculo-Peritoneal Shunt	13
Lumbar Peritoneal Shunt	2
Cerebral Arteriography — Neck Dissection	2
Cerebral Arteriography — Percutaneous	122
Tic Injection	5
Diagnostic Spinal	1
Nerve Blocks	9
Tracheotomy	10
TOTAL	914

THE FELLOWS' REUNION
A TRIBUTE TO DR. WILLIAM CONE

1957

On April 28th and 29th, 1957, a special reunion of the M.N.I. Fellows was held in Montreal. It was the desire of the fellows to pay tribute to their esteemed teacher Dr. William Cone. It was the result of the ideas and hard work of a Committee composed of Dr. Guy Odom, Dr. Robert Pudenz, and Dr. Edwin Boldrey. The Montreal Representative was Dr. Theodore Rasmussen. The date was chosen to follow neurological and neurosurgical meetings held in Boston and Detroit, and was followed immediately by the First Annual Fellows' Society Lecture.

A large number of staff and former Fellows and their families were present. Miss Linda Odom, daughter of Dr. and Mrs. Guy Odom was a special guest, representing the children of M.N.I. Fellows. She was born in Montreal while Dr. Odom was in his residency training here.

The out of town guests were: — Dr. Alex Barnum; Dr. and Mrs. Edwin B. Boldrey; Dr. William Caveness; Dr. Donald Coburn; Dr. and Mrs. James T. Daniels; Dr. Dana Darnley; Dr. Gordon Dugger; Dr. and Mrs. Francis Echlin; Dr. and Mrs. Joseph Evans; Dr. William Fields; Dr. William Grant; Dr. John Hanbery; Dr. and Mrs. Perry Hewitt; Dr. and Mrs. John Hunter; Dr. Everet Hurteau; Dr. Ira Jackson; Dr. and Mrs. Igor Klatzo; Dr. Peter Lehman; Dr. Edwin Lotspeich; Dr. Guy Morton; Dr. Nathan Norcross; Dr. and Mrs. Frank O'Brien; Dr. Guy Odom and Miss Linda Odom; Dr. Robert Pudenz; Dr. Harold Rosen; Dr. Julius Stoll; Dr. and Mrs. Joseph Stratford; Dr. and Mrs. Donald Tower; Dr. and Mrs. Keasley Welch; Dr. Peter Westhaysen.

The social events got under way Sunday afternoon with a tea at the home of Dr. and Mrs. Cone, and an informal tour of the M.N.I. For some of the out of town guests it was their first chance to see the new wing of the hospital.

The gala event of the Reunion was a Cocktail Party and Banquet held Sunday evening at the Ritz Carlton Hotel. Dr. Robert Pudenz, acting as Master of Ceremonies, presided over the dinner and the after-dinner activities. Speakers were chosen to represent the different periods in the history of the Institute. They ranged from a brief description of the pre-Institute days by Dr. Arthur Elvidge and were concluded by a humorous tongue in cheek description of present life at the Institute by Dr. Branch.

The speakers reminisced about their Institute days and paid tribute to the men who have taught and guided them during their training at the M.N.I. Ira Jackson expressed the feelings of all when he said, "When I'm having difficulty with a case I always think, how would Dr. Cone handle it". Dr. Penfield spoke about the first Fellow, Dr. William Cone. He said that his meeting Bill Cone was one of the luckiest events in his life and one which had a profound influence on the history of the Neurological Institute.

After Dr. Penfield's address, a presentation of gifts was made on behalf of the returning Fellows by Dr. Joseph Evans. Dr. Cone and Dr. Penfield were presented with fountain pen desk sets. Mrs. Cone and Mrs. Penfield were presented with mounted fountain pens. These small gifts were to serve as tokens of the deep appreciation felt by the Fellows toward their illustrious teachers and the high esteem in which they are held by all.

The scientific session consisted of 12 short papers delivered Monday morning in the amphitheatre of the M.N.I. by members of the returning Fellows' group. This program was presided over by Dr. Rasmussen and was made up of the following authors and their papers.

- 1) *Spinal Epidural Hemangiomas in Pregnancy.*
WILLIAM S. FIELDS, M.D.
- 2) *The Role of Trauma in Disc Herniations.*
NATHAN C. NORCROSS, M.D.
- 3) *Cervical Spondylosis—Treatment by Removing the Offending Spurs—Movie.*
ED. S. LOTSPEICH JR., M.D.
- 4) *Observations on the Surgical Treatment of Cervical Carotid Artery Thrombosis.*
IRA J. JACKSON, M.D.
- 5) *Cerebellar Subdural Hygroma and the Post-Traumatic Syndrome—Diagnosis and Treatment.*
WILLIAM T. GRANT, M.D.
- 6) *Major Neurosurgical Complications from Minor Surgery.*
JOHN HUNTER, M.D.
- 7) *The Production of Hydrocephalus in the Experimental Animal.*
ROBERT H. PUDENZ, M.D.
- 8) *Intraspinal Sprouting of New Afferent Terminals as a Cause for Spasticity.*
GEORGE M. AUSTIN, M.D., and GRAYSON MCCOUCH, M.D.
- 9) *The Relationship Between Edema, Blood-Brain-Barrier and Tissue Elements in a Local Brain Injury.*
IGOR KLATZO, M.D.
10. *Observations on the Supersensitivity of Chronically, Neuronally, Isolated and Partially Isolated Cerebral Cortex.*
FRANCIS A. ECHLIN, M.D.
11. *A Simplified Technique for Chemopallidolysis for Parkinsonism — Movie.*
ROBERT S. KNIGHTON, M.D.

The First Annual Fellows' Lecture was held on Monday Afternoon, April 29th, 1957. The first Fellow Lecturer was Dr. Joseph P. Evans, Professor of Neurological Surgery at the University of Chicago. His subject was — "Brain Injury; Some Present Concepts and Challenges".

This Lecture was made possible by funds contributed by M.N.I. alumni and staff. The Lectureship is the function of the Fellows' Society and the administration of the Lectureship and the collection of funds is their responsibility. The alumni and staff are asked to give a minimum of \$5.00 each every year to support the Lectureship, and the Fellows' Society and Newsletter. The speaker each year is to be chosen from among the distinguished alumni of the Institute.

It is hoped that adequate funds to support a Lecture will be collected each year and that in time an endowment for this Lectureship will be obtained. It is also the hope of the Fellows' Society and the staff that Reunions such as this can be held once every 3 to 5 years, so that the Institute personnel and the alumni can keep in close contact.

