

Twenty-first Annual Report

of the

MONTREAL NEUROLOGICAL INSTITUTE

and the

DEPARTMENT OF NEUROLOGY

AND NEUROSURGERY

McGILL UNIVERSITY

1955-56

CONTENTS

Report of the Director	7
Report on Research	10
Report on Teaching and Graduate Studies	13
Clinical Staff	16
Consulting and Adjunct Clinical Staff	17
Teaching Staff	17
Executive Staff	18
Resident Staff	18
Laboratory Departments	20
Nursing Staff	22
Social Service Staff	22
Appointments in other Teaching Hospitals	22
Report of the Neurologist	24
Report of the Neurosurgeon	25
Report on Hospitalization	27
Report of the Director of Nursing	30
Department of Social Service	31
Department of Anaesthesia	33
Department of Radiology	34
Department of Neurochemistry	34
Donner Laboratory of Experimental Neurochemistry	35
Department of Electroencephalography	36
Department of Neurophysiology	37
Department of Neuroanatomy and Neurological Pathology	38
Tumour Registry	39
Photography	40
The Fellows' Library	40
The Montreal Neurological Society	41
The Fellows Society	42
Clinical Appointments and Fellowships	43
Courses of Instruction	43
Publications	45
Donations	49
Classification of Diseases	50
Classification of Operations	51
Items of Interest	53



COLIN K. RUSSEL

Doctor Colin Russel died in Montreal on March 4th, 1956, in his 80th year, one of the last of the pioneers of Canadian Neurology.

Following his graduation from McGill University in 1901, his plan to study Neurology took him first to Baltimore, with Osler, then Zürich with Professor von Monakow, Berlin, with Professor Oppenheim, Paris, with Pierre Marie, Dejerine and Babinski, and finally to the National Hospital, London — for a year's internship in 1905.

Doctor Russel returned to the Royal Victoria Hospital in 1906 — where he advanced rapidly to become Neurologist in 1910, and there he built up a strong Department of Neurology over the years which followed. In 1928 he combined forces with Wilder Penfield, William Cone, and Arthur Young, Norman Petersen and Doctor Fred MacKay to form the Department of Neurology and Neurosurgery of McGill University, which in 1934 moved into the new Montreal Neurological Institute. His personal contribution to the life of the Institute since its founding has been a very considerable one.

He published a number of important papers on neurological and psychiatric subjects during his active years, and his work was well known throughout Canada, the United States and Great Britain. He was a member of many neurological societies here and abroad, and in 1935 served as President of the American Neurological Association.

Those of us who were his students and junior colleagues will always remember his wise and philosophical outlook, his delightful anecdotes and his gay humour. He was an adventurer at heart. Before he entered Medicine, this venturing spirit took him with a survey party one summer across Northern Quebec by canoe and portage — the first party of white men to cross Ungava and he carried this outlook on through his neurological career.

He had the honour and satisfaction of serving his Country with distinction in both World Wars as a Lieutenant-Colonel in the R.C.A.M.C. and was cited for his valuable services.

While his last years were marred by ill health, and family tragedy, he frequently took part in the activities of the Montreal Neurological Institute until a short while before his death.

With his passing has gone our last personal link with the great British Neurologists of the Victorian Age, whom he knew — giants like Jackson, Ferrier and Gowers.

We mourn the death of Colin Russel, but rejoice in the rich heritage he has left to Canadian Neurology.

F. L. McNaughton, M.D.

REPORT OF THE DIRECTOR

WILDER PENFIELD

The Annual Meeting of the Montreal Neurological Institute is always an event with a double significance. It is the 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.

First: THE HOSPITAL

"Christmas", said Ebenezer Scrooge, "is a time for balancing your books and having every item in 'em . . . presented dead against you." You may think that the Annual Meeting of this Hospital is a little like that in these days of rising prices.

We had hoped to show no deficit but we have failed by what is called a small margin. The reason why is plain enough to see. We care for rich and poor alike, as other hospitals may do. But we go further, accepting the human wrecks, men unconscious, paralyzed, cases for which treatment was abandoned elsewhere. Sometimes we must give twenty-four-hour nursing. And many lives are salvaged thus, lives that would have been lost but for the courage and skill, the tools and team work to be found in this Institute, a place also where men find cheer and hope and friendship.

Society in a free country like Canada must do what it can for the helpless and those who suffer. Institutions, like this one, carry a part of the burden of responsibility for the public. Therefore we report to the people and we must have their help and understanding.

Mr. Duplessis and the members of the Government in Quebec realized this fact when they increased our recurring annual grant five years ago, and the City of Montreal followed suit. Otherwise we could not have continued at that time. Otherwise, too, our friends led by Mr. J.W. McConnell would not have built the wing which raised our bed capacity to 136.

That was our "Second Foundation" which was celebrated by publication of the Second Foundation Volume, entitled Prospect and Retrospect in Neurology. We expected that this year our deficit would remain within this enlarged provision, as it did during the first 6 years of the Institute's life, 1934-40. The Assistant Director for Hospitalization, Dr. Preston Robb, has done his best, ably assisted by the Business Manager, Mr. Donald Bain. But there will be a hospitalization deficit in the vicinity of \$50,000. The major cause of this is the high cost of the nursing care which is increased by our helpless patients. This problem calls for continuing study by our hospitalization consultant, Dr. Gilbert Turner, and the Director of Nursing, Miss Eileen Flanagan. We cannot lower our standards, cannot turn away from the more desperate cases and let them die. At the same time we must strive to sacrifice the non-essentials in hospital care.

I have visited hospitals in a large country that has a communist organization of life as well as in a country where the economic structure is socialistic, and I have not seen a neurological institution to compare with the Montreal Neurological Institute in efficiency of clinical treatment or in the flow of contributions to knowledge: this is not intended as an idle boast. It should be a source of satisfaction to those who live in this Province.

Meantime we who make up its staff will devote ourselves to keeping down the costs, the elimination of unnecessary personnel and the improvement of performance; nothing for luxury, everything for efficiency and service. When seen in perspective this Institute is not an unreasonable expense to Society but an actual saving.

Our professional colleagues in Britain, and those in the Soviet Union as well, have one advantage over us. They need have no concern as to the costs of hospitalization and little compulsion to ask one man or woman to do the work of two. But because of that very fact it would, in my opinion, cost any government that might try to operate this hospital at its present level of efficiency, a great deal more than the figures shown in our statement.

It is clear that the Hospital of the Montreal Neurological Institute has urgent need of an increase in the annual grants from the Province of \$50,000 annually.

Many hospitals have endowment to help with hospital costs. In the past, we have had none. But a most welcome start will be made by a bequest from the will of Mrs. Hobart Springle, amounting to \$124,500. I hope that, in time, income from increased endowment will be available to cover extraordinary nursing costs in this specialty.

In 1877 the daily cost of a patient in the Montreal General Hospital was 71 cents. Today a ward patient costs the Montreal Neurological Institute \$23.00. What a change! And what a problem, when the Government of Quebec, under the Public Charities Act, allows only \$7.50 per day for the support of the destitute!

The public must not blame us if, as the result of the changes during the span of one lifetime, good hospital care has become so costly. Who, among those that hear or read this report has not reaped some benefit from it? How many of you that are alive today would otherwise have been marked for death? Most of the great disease killers are gone, some even forgotten: childbed fever, wound infection, diphtheria, smallpox, cholera, typhoid, pneumonia, syphilis . . .

There are plenty of unsolved problems remaining, arthritis, the common cold, trauma, cancer, and the sclerotic changes of artery and heart. And then there are the mysteries of brain and nerve, the mechanisms of insanity and of abnormal behaviour. The future is full of exciting promise.

I suppose that death will be the doctor's foe forever. And yet, death is good. All men must hope in time to go gladly to a well-earned rest. Medicine has postponed the day and many more now leave this world in the kindly drowsiness of senility.

Let me now speak for a moment of the Institute as a whole, Scientific as well as Clinical. You have heard the story of the splendid year of work in the field of teaching and research from Rasmussen and Jasper, McNaughton and Cone have dealt with the clinical achievements.

Whereas support for hospital costs comes to us from the Province and City, they make no contribution to research or teaching. Support for the Scientific Laboratories comes 1) from endowments for research, 2) a Consolidated Grant from the Dominion Government, and 3) from multiple special grants and gifts. There has never been a deficit in the scientific budget, although we have sometimes been held back by lack of funds — temporarily.

I am happy to announce that the annual grant from the Federal Government in Ottawa has been increased from \$43,500 to \$48,500, and Mr. Paul Martin's Department of Health and Welfare has helped us repeatedly to acquire unusual equipment.

A generous recurring five year grant of \$20,000 from the Bronfman Interests, which has partially supported Dr. Jasper's Laboratory of Neurophysiology, comes to an end this year and we wait anxiously for a decision as to whether the permanent support which is so necessary for neurophysiology may be possible.

Beyond this the greatest single need at present, on the scientific side, is support for the Fellowship and Graduate Study scheme which has been outlined by Dr. Rasmussen.

In the field of Nursing education, Miss Flanagan has longed for nursing bursaries. At the present time graduate nurses are coming to her for special training from all over the world and bursaries for some of them would help her greatly.

The work on multiple sclerosis, which was initiated by a gift of \$50,000 from the late I. W. Killam, shows great promise in the hands of J. B. R. Cosgrove. Additional support was given by the Multiple Sclerosis Society of Canada in the outset. Now, the work goes on but it must have future financial provision.

Changes have occurred this year, changes sweet and bitter. The Medical School and Hospital of the University of Saskatchewan has taken Dr. William Feindel from us to head their Department of Neurosurgery and Dr. Joseph Stratford to be his assistant. Dr. André Pasquet has gone to Dalhousie University, turning over the direction of our Anaesthesia Department to his able associate, Richard Gilbert. A serious loss is that of Dr. George Olszewski, who will leave us this summer to go to the University of Saskatchewan. He had done brilliant work in neuroanatomy since he came from Poland eight years ago. Our best wishes go with him and all the others. It is good to realize that in leaving us they do not desert our common cause.

There have been sad losses as well.

A. T. RASMUSSEN, PH.D.

Last year at this time A. T. Rasmussen was Visiting Professor of Anatomy at McGill University. He gave a full course of instruction in the Anatomy of the Nervous System here in the Institute. A brilliant course it was, which will never be forgotten. We must now record our sorrow at his death, which occurred soon after he and Mrs. Rasmussen left us.

For thirty-six years he had taught Neuroanatomy at the University of Minnesota. He left his mark of high scholarship and enthusiasm on generations of students — not least among whom is his own son and our associate, Theodore Rasmussen.

COLIN RUSSEL, B.A., M.D., F.R.C.P.(C.)

We mourn the passing of Colin Russel, friend, companion, teacher, explorer, soldier and troubadour. He was the founder of Neurology in the Montreal Neurological Institute, a renowned leader in the field. Words seem inadequate to express the affection we felt for him, all of us. Principal James has said that the memory and tradition that cling to an institution may be immortal. So it will be with our first neurologist. I borrow the phrase we have heard him use so often, "Bless you." Bless you, Colin Russel.

It is planned to have a Colin Russel Memorial Meeting of the Montreal Neurological Society in the autumn. At that time a biographical essay will be read by his distinguished pupil, Dr. Francis McNaughton. It is our hope that there may be established a Colin Russel Lectureship at the Montreal Neurological Institute which would bring distinguished neurologists to lecture every year or two. I make this statement to call attention to the need of an endowment for that purpose.

This Institute has never stood still. Thank heaven! Let it forever press forward to new projects, greater realizations. Only death gives comfortable ending of effort. Life and growth are indivisible. And there is so much to be done, so many fields to be explored among the limitless mysteries of the human body — the mysteries of the brain and of the springs of man's behaviour.

RESEARCH

DR. HERBERT JASPER

Two years ago when contemplating the inevitable expansion of all departments of this Institute, I expressed serious concern that there might be a deterioration in the quality of our work due to increased administrative load carried largely by those whose time and energies should be free for more creative work. Reviewing the present stage in the reorganization of research activities, it is apparent that we have not been able to overcome completely a degree of administrative paresis. The clinical signs of harried expressions and mounting frustrations in our attempts to get on with original and productive work are unmistakable.

On the other hand, the accomplishment of larger teams of competent workers with greatly improved facilities is even more impressive. I have confidence that the paresis is only a transient reaction to a major operation. It may be overcome by vigorous and continued therapeutic measures with a thorough appreciation by physicians in charge that continuity of uninterrupted time for concentration and contemplation is a necessary prerequisite for successful creative effort.

In the Donner Laboratory of Neurochemistry, the steady systematic progress of basic research into the intimate mechanisms of function in brain and nerve, normal and abnormal, is a model of what can be accomplished by a smoothly working team with inspired leadership and adequate facilities. With the growing evidence that an ever increasing number of the most common and the most serious mental and nervous diseases may be the result of specific defects in brain metabolism or in the neuro-chemical substances which regulate the activity of brain cells the potential importance of the work of this department is hard to exaggerate.

The two outstanding achievements of the neurochemistry department which may well be called discoveries, are the purification and near isolation, with the help of the Merck Laboratories, of Dr. Florey's inhibitory substance, now called Factor I, and the discovery of the missing link in the metabolic cycle of brain tissue which causes irreversible damage to ensue when it has suffered a period of anoxia. This has been shown to be due to a depletion of a specific chemical substance, Adenosine Triphosphate or ATP, which when supplied will enable brain to recover normal metabolism after suffering a period of oxygen lack which would otherwise result in irreversible damage.

Further studies of the physiological importance of Factor I have shown that it is much more highly concentrated in certain parts of the brain having specialized functions, that its action is blocked by certain convulsant drugs such as Picrotoxin and Metrazol, thus giving the first good explanation of the convulsant action of these substances and perhaps of certain kinds of epilepsy. Of more general interest may be the demonstration that the action of this inhibitory substance may be blocked by ethenol, a very commonly used drug with a well established disinhibitory action upon those who imbibe.

I feel confident that the discovery of Factor I will rank with that of Acetylcholine, to which it has some properties in common, and may be even more important in these days when inhibitory substances may be of greater value than excitatory substances in our attempt to treat patients with mental and nervous disorders.

In the Departments of Neuroanatomy and Neuropathology, the most outstanding work has been accomplished in studies of immunological reactions of brain in relation to tissue hypersensitivity. This is of importance in our understanding of demyelinating diseases, certain forms of encephalitis, and for our understanding of mechanisms of tumor growth. For example, it may be that the malignancy of a given tumor may not be determined so much by its histological appearance, but by the sensitization of the host tissue in which it is growing.

Radio-autographic studies of changes in permeability of cerebral vessels as affected by convulsive seizures and other neuropathological conditions have already yielded brilliant results, opening up a whole new field of important study. Completion of the new Stereotaxic Atlas of the brain stem of the cat will also be greeted with enthusiasm in many laboratories throughout the world where such a guide to neurophysiological studies of this part of the brain has been sorely needed.

In the Neurophysiological and E.E.G. Laboratories, research has been coordinated most closely with clinical, neurosurgical and psychological studies of epileptic patients in the constant search for a better understanding of brain mechanism causing various forms of epileptic seizure in relation to mechanisms underlying motivation, learning, memory, perceptual hallucinations, and other mental processes.

Most important have been the neurophysiological, anatomical, clinical and experimental psychological studies of the functional properties of the Rhinencephalon. Here, in these more primitive parts of the brain we find buried many of the nerve cells and circuits responsible not only for the emotional drives directing our actions, but of essential importance also to the laying down of memories and their recall in the continuing stream of conscious mental life.

The perfection of microelectrode recording techniques is gradually making it possible to analyse some of these complex processes in terms of the behaviour of single nerve cells and their synaptic and dendritic relationships with conducting networks and pathways, conveying messages and coordinating functions from different parts of the brain.

Single cells in the brain stem have been found which can be fired by stimulation of cortical areas of either the right or left hemisphere, as well as by different kinds of ascending sensory impulse. This gives further proof for the existence of a centrencephalic integrating system of the brain stem, as defined hypothetically by Dr. Penfield.

Before concluding this report on research, I would like to draw attention to a new research department of this Institute which we will hear much more about in the coming years. This is the Department of Anesthesia, or Anesthesiology, under the direction of Dr. Gilbert. Here we find a wealth of the newest and most accurate equipment being assembled for the measurement of many vital functions of the body, in man as well as in experimental animals. Improved care of neurosurgical and seriously ill patients, as well as better understanding of the action of many new drugs such as chlorpromazine, the importance of electrolyte balance, and many other practical and basic contributions may be expected from these new laboratories. This is a most welcome development in this golden age of pharmacology.

In conclusion, dazzled by the high lights of the more spectacular discoveries, we should not lose sight of equally important progress resulting from the steady accretion of knowledge taking place in the daily work of the clinics, laboratories and operating rooms which sets the stage for the occasional discovery, and without which they would not be possible.

TEACHING AND GRADUATE STUDIES

DR. THEODORE RASMUSSEN

This year's report in regard to undergraduate teaching concerns principally the deliberations of the Curriculum Committee of the Medical School. This Committee has met at monthly intervals throughout the school year, and discussed many aspects of medical education, basic and not so basic. This has been mainly a year for fact finding and soul searching, our own souls as well as those of other institutions where new techniques and concepts of the training of today's men of medicine are being explored.

Earlier this spring, the survey team representing the Accreditation Committee of the American Medical Association, the Association of American Medical Colleges and the Canadian Association of Medical Schools visited McGill and was prevailed upon to share with the Committee their knowledge of curriculum problems and the various ways they are being handled in other schools across the continent. The survey team discussed with the committee quite frankly their views on many of the problems that constantly harass a faculty that tries, in this mid point of the twentieth century, to steer a middle course between teaching the medical student all about a few things or very little about very many things; a middle course between slavish obeisance to laboratory tests or over reliance on clinical intuition; a middle course between sole concern for the patient's tumor or diabetes and such preoccupation with the patient's emotional dynamics that associated primary organic disease is forgotten; a middle course between primary concern with a symptom and such overwhelming concern with the patient's role in society that sight is lost of the fact that most of the ailments of mankind are the proper concern only of the patient, his family and his doctor.

We have learned that the curriculum problems at McGill are clearly not unique, and we have learned something of the many ways in which other schools are altering their curricula in an attempt to do a better job of turning the premedical student into a basic doctor who, after graduation, can successfully follow his interests and talents into any of the many facets that make up the Medical Sciences today. Next year the Committee faces the more difficult task of fashioning out of the distillate of this year's deliberations, concrete recommendations to bring before the Faculty.

We regret to report that Montreal, McGill and the Institute could not compete successfully with the charms of the West, Saskatoon and the University of Saskatchewan, with the result that George Olszewski will soon be pulling up stakes and heading for the prairies. He carries with him our congratulations to the University of Saskatchewan on his joining their faculty, and our best wishes for his personal and scientific happiness in his new post there as Senior Research Associate of the National Research Council. He has contributed much to the Institute and has constructed a strong foundation in medical neuropathology and neuroanatomy upon which we can build when his successor, for whom we are actively searching at the moment, is found.

Also soon to leave us for the West are the two Drs. Florey who go to Seattle, where Dr. Ernst will assume an important post in invertebrate zoology at the University of Washington, thus returning to his native scientific habitat after a most productive sojourn in the halls of the neurological sciences. He leaves behind a scientific legacy that we expect will help keep some of the Seventh Floor laboratories occupied for a long time to come.

Teaching at the graduate level at the Institute has always been active in type, both in clinical and basic fields, the residents forming an integral part of the team that cares for the patient, the Fellows in the laboratory learning by actively carrying out research projects. This is supplemented by a series of lecture seminars, which in the past year we have streamlined as much as possible into the framework of the Monday afternoon period of 4:30 to 6:00 o'clock, with neuroradiology, neurophysiology and neurochemistry taking over this period successively. We hope this change will benefit both Fellows and Staff by allowing for more uninterrupted laboratory time each week and at the same time enhance the continuity of this didactic survey of basic neurological sciences.

Dr. Jasper's Monday noon research seminar in its second year continued to play an important role in providing for constructive criticism of work in progress, in pointing out new implications, in keeping the clinician abreast of research activities, and in providing a channel for the introduction of clinical problems into the laboratory scene. This new avenue of communication seems to have won a permanent place in our scheme of activities.

The special knowledge and skill in electronics brought to the Institute this past year by Dr. Robt. Martin, Bronfman Fellow in Neurophysiology, has enabled us to centralize under him all supervision, maintenance and construction of electronic equipment in a new Department of Neuroelectronics. Both the clinical and scientific work of the Institute will benefit from the increased efficiency this reorganization should provide.

One of the great strengths of the Institute is the influx of new enthusiasm, new view points, special skills and knowledge brought by the continuing stream of young men coming from all parts of the world to work and learn in the laboratories and in the clinical services here. With the increasing complexity of medicine in general and our special field in particular, the training period grows longer and an increased burden is placed on the trainee who has no independent means to tide him over this period. Fellowships for specific projects help many and training grants from governmental sources provide some help for a few. These lessen only slightly, however, our pressing need for endowment to provide realistic fellowships, both at the junior level for the first or second year man, and at the senior level to permit the able young man with proven research ability to initiate a major research program near the end of his training period when research interests all too often must give way to the financial need to establish a practice.

These endowed fellowships would pay an additional dividend in lessening the encroachment on valuable research time inevitably caused by the necessity of outlining projects, submitting applications, preparing interim reports and

drafting final reports required by the usual outside fellowships upon which we now rely so heavily.

Endowed fellowships would also provide for the temporary support of the occasional established investigator who has a special problem that can be studied with particular facility at the Institute. Such visiting investigators would add much for the Institute, and the collaboration that would be stimulated with other institutions working in the neurological sciences would contribute to the constantly increasing knowledge of basic reactions of the nervous system that underlie so many of the ailments of mankind. The importance of these reactions is becoming increasingly evident in the fields of internal medicine, general surgery, pediatrics and psychiatry, as well as in neurology. The rapidly increasing scope and opportunities for productive research in our laboratories underscore the need for permanence of support.

The daily challenge to the enquiring mind of clinical and laboratory problems was never greater, and we look forward to exciting prospects in the coming year.

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.)

Honorary Neurologist

COLIN RUSSEL, B.A., M.D., F.R.C.P.(C)*

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.R.C.S. (Eng.), M.B., B.S. (Lond.), M.R.C.S. (Lond.)
REUBEN RABINOVITCH, B.A., M.D., M.Sc.
WILLIAM TATLOW, M.D., M.R.C.P.

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.

Associate Neurosurgeons

GILLES BERTRAND, B.A., M.D., M.Sc.
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)

Anaesthetist

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

Associate Anaesthetist

R. W. M. BETHUNE, M.D.

Assistant Anaesthetist

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

Neurochemist and Donner Fellow

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

* Deceased.

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

Neuroanatomist and Neuropathologist
JERZY OLSZEWSKI, Ph.,D., M.D.

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

CONSULTING AND ADJUNCT CLINICAL STAFF

Consulting Neurologists	ROMA AMYOT, B.A., M.D. (Montréal and Paris) SYLVIO 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 Pathologist	LYMAN DUFF, B.Sc., M.A., M.D., Ph.D. (Tor.), F.R.C.P.(C), F.R.S.C.
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. JEAN L. LÉGER, M.D.

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
Assistant Professors of Neurology	PRESTON ROBB ARTHUR YOUNG W. F. T. TATLOW JAMES COSGROVE DONALD LLOYD-SMITH
Assistant Professors of Neurosurgery	HAROLD ELLIOTT ARTHUR ELVIDGE

Assistant Professor of Neurological Radiology	DONALD McRAE
Assistant Professor of Neuroanatomy	JERZY OLSZEWSKI
Lecturers in Neurology	BERNARD GRAHAM REUBEN RABINOVITCH
Lecturers in Neurosurgery	LAMAR ROBERTS (Reford Fellow) GILLES BERTRAND
Lecturer in Neurochemistry	HANNA PAPIUS
Lecturer in Electroencephalography	PIERRE GLOOR
Lecturer in Clinical Psychology	BRENDA MILNER
Demonstrator in Neurology	IRVING HELLER
Demonstrators in Neurosurgery	RANKIN HAY VICTOR KLEIDER
Demonstrator in Neuropathology	WARREN SIGHTS
Demonstrator in Electroencephalography	LEWIS HENDERSON
Demonstrator in Experimental Neurology	ERNST FLOREY

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

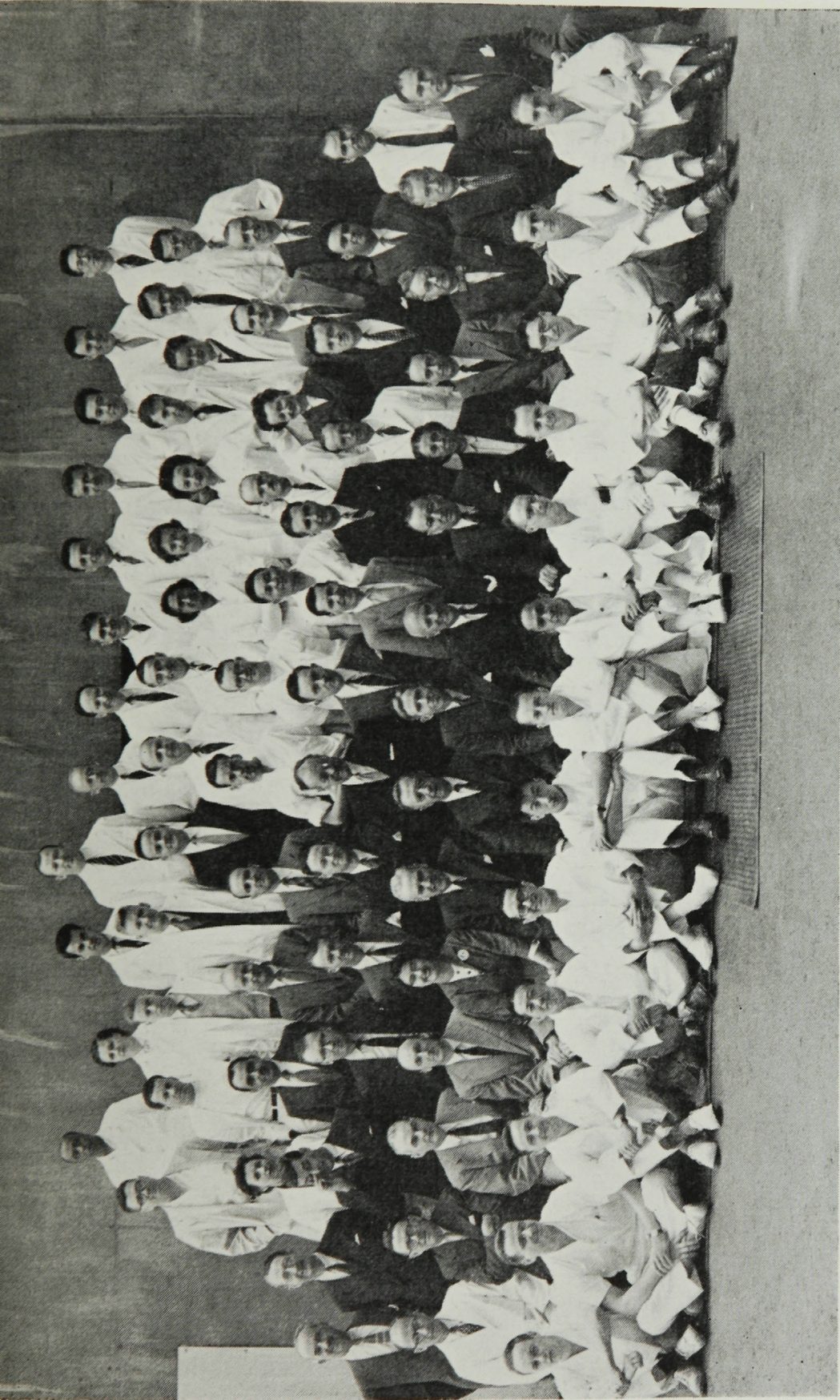
Professors	WILLIAM CONE
(Chairman)	HERBERT JASPER
Associate Professors	FRANCIS McNAUGHTON THEODORE RASMUSSEN
Assistant Professors	K. A. C. ELLIOTT ARTHUR ELVIDGE JERZY OLSZEWSKI

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	MR. DONALD C. BAIN
Executive Secretary	MISS ANNE DAWSON

RESIDENT STAFF — July 1955 — July 1956

Senior Resident	ARMANDO ORTIZ
Neurosurgical Residents	JOHN ROTH*, ALAN ROTHBALLER, WARREN SIGHTS*, CHARLES BRANCH*
Neurological Residents	VICTOR KLEIDER*, ALLAN MORTON*, THEODORE HOFF
Neurological Service Assistant Residents	NICHOLAS ZERVAS*, ALLAN MORTON*, Y. B. KIM, ALEXANDER DE WILLEBOIS*, JAGDIS SIDDOO*, HANS BAMMER*, ROBERT MORGAN***, A. J. BLAIR***, DAVID C. FRASER***, LOUIS GAST***, SAMUEL FREEDMAN****, M. E. STALKER****, E. WALTER****, J. CYRIL SINNOTT****
Neurosurgical Service Assistant Residents	JOHN KENNEDY, CHARLES BRANCH* EMIL BERGER, C. I. TSAI, LESLIE GEIGER*, GORDON THOMPSON*, THEODORE HOFF*



Top row, left to right: DRs. P. HENDERSON; L. GERHARD; M. ROSENFELD; E. KEENER; G. MATHIESON; M. RAYPORT;
 J. OLSZEWSKI; A. R. MARTIN; N. ZERVAS; J. WADA; W. SIGHTS; M. NUMOTO.
 Second row, left to right: DRs. J. ROTH; M. HÉON; B. K. DOANE; E. FLOREY; A. BAZEMORE; B. ROZDILSKI; V. KLEIDER; J. SIDDOO;
 H. PAPIUS; B. HODJERA; M. VULPÉ; E. FLOREY; R. LENDE; R. MOLINER.
 Third Row, left to right: DRs. M. MORROW; A. BERRETT; B. COLDWELL; R. MARTINEZ; A. DE WILLEBOIS; G. THOMPSON;
 Y. B. KIM; C. GAUTHIER; B. MILNER; J. ORBACH; MR. BAIN.
 Fourth Row, left to right: DRs. R. RABINOVITCH; R. GILBERT; L. ROBERTS; R. MILLAR; R. W. BETHUNE; D. LLOYD-SMITH;
 A. W. YOUNG; L. STEWART; G. BERTRAND; I. HELLER; B. F. GRAHAM; B. COSGROVE; G. RICCI; P. GLOOR.
 Fifth Row, left to right: DRs. H. H. JASPER; MR. HOGAN; DR. D. McRAE; F. L. McNAUGHTON; Miss J. BEATTY; J. G. TURNER;
 PROF. I. WECHSLER; DEAN DUFF; W. G. PENFIELD; W. V. CONE; Miss E. FLANAGAN; T. RASMUSSEN;
 K. A. C. ELLIOTT; A. R. ELVIDGE; P. ROBB.
 Sixth Row, left to right: DRs. A. ROTHBALLER; A. MORTON; H. G. BAMMER; T. D. LIEN; E. BERGER; C. TSAI; J. KENNEDY;
 A. ORTIZ; T. HOFF; C. BRANCH; I. GEFIGER; R. SINNOTT; A. TAMAS

Residents in Anaesthesia..... M. M. ERKUL*, PAUL QUAN*,
B. M. HODJERA*, G. F. BRINDLE*

Fellow in Neuroradiology ARNOLD BERRETT

*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)

Electroencephalographic Fellows:..... LEVER STEWART, A.B. (Princeton)
M.D. (Penn.)

JOHN ROTH*, M.D. (Kansas)

Electromyographic Fellow MITSUO NUMOTO, M.D. (Okayama, Japan)

Visiting Fellows R. CALDERON REYES, M.D. (Colombia)

PAUL TOOMIK, M.D. (Tartu, Estonia)

Chief Technician and Demonstrator..... LEWIS HENDERSON

Experimental Neurochemistry

Neurochemist and Donner Fellow..... K. A. C. ELLIOTT, M.Sc., Ph.D., Sc.D.

Associate Neurochemist HANNA M. PAPIIUS, M.Sc., Ph.D. (McGill)

Fellows ALVA BAZEMORE, Ph.D. (U.N.C.)

ERNST FLOREY, Ph.D. (Graz)

IRVING H. HELLER, M.D., M.Sc. (McGill)

MICHAEL ROSENFELD, B.Sc. (McGill)

Neuroanatomy and Medical Neuropathology

Neuroanatomist and Neuropathologist JERZY OLSZEWSKI, Ph.D., M.D.

Fellows..... ELIZABETH FLOREY, Ph.D. (Graz)

MICHEL VULPÉ, M.Sc. (McGill)

BOHDAN ROZDILSKY, M.D. (Lvov, Poland)

MARY MORROW, M.D. (McGill)

LIESELOTTE GERHARD, M.D. (Dusseldorf)

WARREN SIGHTS*, M.D. (Chicago)

RAMON MOLINER*, M.D. (Madrid)

Neurophysiology

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

Assistant Neurophysiologist A. R. MARTIN, M.Sc. (Man.),
Ph.D. (London)

Fellows MARK RAYPORT*, B.A. (Earlham)
M.D., C.M. (McGill)

CLAUDE GAUTHIER, M.D., M.Sc. (Montréal)

RICHARD LENDE, M.D. (Oregon)

GORDON MATHIESON, M.D. (Aberdeen)

JOHN ORBACH, Ph.D. (Princeton)

J. A. WADA, M.D. (Hokkaido, Japan)

Laboratory Supervisor MARY ROACH, R.N.

Photography

Supervisor..... JERZY OLSZEWSKI, Ph.D., M.D.

Photographer..... CHARLES HODGE

Research in Multiple Sclerosis

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

Chemist PAMELA WEISS, B.Sc.



Front Row, left to right: Miss HOGAN (OR), Miss BAIN (OR), Miss H. BELANGER (2S), Miss MACDONALD (2S),
 Miss MURRAY (OR), Miss G. BELANGER (2S), Mrs. HAMMOND (2N), Miss KIMBERLEY (3N), Miss RAWDING (PG),
 Second Row, left to right: Miss MACMILLAN (4N), Miss CAVANAUGH (2S), Mrs. TOSH, B.C., E.C.F., Miss BARROWMAN,
 Miss STANLEY (OR), Miss AINGER (3S), Miss JOHNSON, Miss DICKSON (2S).
 Third Row, left to right: Miss LABERGE (4S), Miss LANTEIGNE (4S), Miss HARRISON (4N), Miss A. CAMERON (4S),
 Mrs. JOTIC (2N), Miss CUNNINGHAM (2E), Miss REIFFENSTEIN (2E), Miss TODD (P.G.), Miss WRIGHT (N.D.),
 Mrs. JOTIC (2N), Miss CUNNINGHAM (2E), Miss REIFFENSTEIN (2E), Miss TODD (P.G.), Miss WRIGHT (N.D.),
 Miss DUCHEMIN, Miss BEAMAN (4N), Miss MOSGROVE (4N), Miss CARSON (4N).
 Fourth Row, left to right: Miss MILLS (P.G.), Miss PETRIE (3N), Miss O'CONNELL (3S), Miss O'CONNOR (OR),
 Miss KANE (3N), Miss ARASON (N.D.), Miss ADAM (2S), Miss FIELDS (2N), Miss McELROY (N.D.),
 Miss E. MORGAN (N.D. Office), Miss G. MORGAN (2E).
 Fifth Row, left to right: Miss CLARK (P.G.), Miss LANTHIER (3S), Miss RATCLIFFE (P.G.), Mrs. FLETCHER (N.D. 4S),
 Miss DESROCHERS (3N), Miss CLOUTIER (3N), Miss DERMERS (P.G.), Miss STORLE (2E).

Surgical Neuropathology

Neuropathologist.....	WILLIAM CONE, B.S., M.D., F.R.C.S. (C), F.R.S.C.
Assistant Neuropathologist.....	GILLES BERTRAND*, B.A., M.D. (Montreal) M.Sc. (McGill)
Neuropathological Fellows.....	ELLIS KEENER, M.D. (Emery) LESLIE GEIGER*, M.D. (U. of S. Calif.)
Fellows.....	PURVIS HENDERSON, M.D. (New York) NICHOLAS ZERVAS*, M.D. (Chicago)
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.
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.
Senior Caseworkers.....	MRS. GERINE PHILLS, B.A., M.S.W. MRS. MARION GARMAISE, B.A., Diploma in Social Work
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.

APPOINTMENTS HELD IN TEACHING HOSPITALS OF MONTREAL BY MEMBERS OF STAFF

ROYAL VICTORIA HOSPITAL

Neurologist and Neurosurgeon-in-Chief.....	WILLIAM CONE
Neurologist.....	FRANCIS MCNAUGHTON
Neurosurgeons.....	WILDER PENFIELD THEODORE RASMUSSEN
Associate Neurologists.....	PRESTON ROBB ARTHUR YOUNG
Associate Neurosurgeon.....	ARTHUR ELVIDGE
Assistant Neurologist.....	DONALD LLOYD-SMITH
Clinical Assistants in Neurology.....	J. B. R. COSGROVE R. RABINOVITCH

<i>Physician in charge of Electroencephalography and Electromyography</i>	HERBERT JASPER
<i>Associate Radiologist</i>	DONALD McRAE
<i>Assistant in Out-Door Clinics</i>	BERNARD GRAHAM

MONTREAL GENERAL HOSPITAL

<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
<i>Junior Assistant Neurologist</i>	BERNARD GRAHAM

MONTREAL CHILDREN'S HOSPITAL

<i>Consultants</i>	THEODORE RASMUSSEN WILLIAM CONE ARTHUR ELVIDGE DONALD McRAE WILDER PENFIELD FRANCIS McNAUGHTON ARTHUR YOUNG
<i>Director, Sub-department Neurology Director, Cerebral Palsy Division</i>	PRESTON ROBB

REPORT OF THE NEUROLOGIST

DR. FRANCIS MCNAUGHTON

In reviewing the year's work in Clinical Neurology, we seem to have been busier than ever, with an ever-increasing volume of work. Some 1037 admissions to the two Neurological services have been recorded, an increase of 92 patients over the previous year. Approximately half of the Institute beds are now occupied by Neurological patients. Because of the increase it has been necessary to enlarge the house staff to provide a senior and two assistants for each of the two Services. Neurological consultation with the various departments of the Royal Victoria Hospital remains at about the same level as in past years.

All of our Outpatient Clinics have increased in size, and this is particularly true of the Seizure Clinic, where there has been an increase of 345 in the number of clinic visits and a steady rise in the number of registered patients, to a present total of well over 800 cases. The emphasis in this Special Clinic is placed more and more on the rehabilitation of seizure patients, and we are pleased that the Federal-Provincial Rehabilitation Grant in support of this work has been renewed once more. During the past year Doctor Mary Morrow and Doctor Claude Gauthier have assisted in the medical work of the Clinic, with the able support of our two social workers, Mrs. Garmaise and Miss Folliott. We are particularly grateful to Doctor Leo Mergler, our Psychiatric Consultant, for his help in the evaluation of the many clinical problems. The recent action of the Montreal Council of Social Agencies in setting up a Committee to study the needs of the patient with seizures will, I am sure, receive the full support of everyone at the Neurological Institute.

The teaching of Clinical Neurology to undergraduates and graduates continues to be one of the major concerns of this department. Doctor Lever Stewart, as teaching Fellow, supervised the case reporting of the Fourth year students, during the academic year just ending, while four of our Staff members took charge of all bedside teaching for two months apiece. The latter arrangement has been a very satisfactory one for students and staff alike and will be continued.

Graduate teaching is closely related to the Wards and Outpatient Clinics. Clinical Conferences for attending and House Staff are held regularly on Tuesday and Friday mornings, and we feel that these have been of such value to all that they will be continued right through the year. Doctor McRae's x-ray rounds and Doctor Olszewski's clinical-pathological conferences have contributed a great deal to our understanding.

In addition to our own appointed House Staff, we receive for short periods of training assistant Residents from the Departments of Medicine of the Montreal General Hospital and Royal Victoria Hospital. These have all been men of superior ability, and we are grateful for this valuable link with Medicine. Our own assistant residents in turn enlarge their experience in Paediatric Neurology through a three month rotation to Doctor Robb's Service at the Montreal Children's Hospital. This summer we are testing out a second rotation to the Neurological Department at the Montreal General Hospital which should provide broader clinical experience in certain fields, and will tie us more closely to this great hospital.

REPORT OF THE NEUROSURGEON

DR. WILLIAM CONE

This past year the Department of Neurosurgery cared for more patients than ever before. There were quiet periods but not for long. Most of the time all beds were occupied and there was the old-time scramble to get patients in, studied, operated on and discharged. At 100% occupancy all departments must function at high speed. When the occupancy is about 85%, the figure considered to be the best practice by hospital administrators, the load of work is more evenly distributed and can be more thoughtfully done. However, there seems to be little likelihood that the demands on the neurosurgical service will lessen. General medical men are aware of the splendid services in anaesthesia, neuroradiology, electroencephalography and neurochemistry which make our procedures accurate and controlled ones. They are familiar with the research activities of the departments of neurophysiology, neurochemistry, neurological pathology and neurological anatomy, and know that the surgical service is guided in newer methods of treatment by them. Doctors will continue to refer patients in numbers and to tax the facilities available.

Nor can the part the Nursing Service and the Social Service Department play in increasing the demand for treatment here be minimized. Their faithful, diligent, unselfish work is widely recognized and has done much to establish the fact that the Montreal Neurological Institute is interested not only in teaching and research, but is also much concerned with the patient as an individual.

Nine hundred and forty-five (945) operations were done. The scatter of the various procedures changes little over the years. However, because of Dr. Rasmussen's and Dr. Robb's interest in the epileptic hyperkinetic child with significant damage to but one side, hemispherectomies are being carried out more frequently than in the past. Dr. Penfield's old maxim that bad brain is worse than no brain at all is being borne out again in patients where the abnormal hemisphere has been completely removed and the patient has been much improved.

Judged by Dr. Frank Meleney's criteria, the operating room has been well run. Meleney states that in clean operative cases both serious and trivial infections should be reduced to less than two percent. On the services where the prophylactic local application of antibiotics is used routinely the infection rate is even lower. The entire operating room staff and the surgeons can be proud of the record.

We wish to take cognizance at this annual meeting of the help the Cancer Research Society has given us in the past in support of research. We also wish to thank the Society for the grant of three thousand dollars for this next year for a bed to be occupied by needy patients with cancer, and whom our special investigations and treatment facilities can help, both in the study of cancer and in the alleviation of the patient's suffering. We hope that next year the Society can provide two beds.

The Cancer Aid League has given a grant of five thousand dollars for this coming year. This is two thousand dollars more than in the past year. Miss Beatty in the Social Service Department and Mr. Bain in the Business Office are the best witnesses as to what this grant has meant to patients with cancer and to their families.

May the officers and workers in these two societies never lower their aim or lessen their activities in trying to help the patient with cancer through either research or direct aid.

Two recent experiences have again aroused our enthusiasm for the transportation of the sick and injured by air. In the first one, the Royal Canadian Air Force brought Dr. J. Arthur McCue and his little patient with a grave head injury from Smiths Falls in a large Sikorsky helicopter. It was possible for Dr. McCue with the help of the nursing sister and the medical warrant officer to give the little lad a blood transfusion and to dress the wound to control bleeding during the trip. The helicopter landed on Molson Stadium late in the dusk of a winter afternoon, but a few hundred feet from the Institute, settling gently onto a small patch cleared of snow. Within minutes definitive treatment was being instituted, using the special facilities the Institute can provide. The lad now wears a football helmet to cover the defect in the skull which will be filled in later.

The second experience had to do with the large hospital airliner which the United States Air Force sent to transport two patients with poliomyelitis to the Polio Rehabilitation Center in Cleveland, Ohio. The equipment was as complete as that in most modern hospitals and the doctor, two nurses and two medical technicians were all especially trained for the work, and ready to carry out any special treatment necessary during the flight.

For many years patients have been flown to the Montreal Neurological Institute for treatment. This means of transportation has saved lives. The question of the practicability of an air ambulance service to transport patients to special centres was briefly discussed with Premier Duplessis years ago. His comment at that time was that he proposed to keep his government's feet and ventures on solid ground and did not propose to let them take off into thin air. Now years later, from the experience gained during and since the war, it has become increasingly evident that air travel is the preferred mode of transportation for sick people. A general rule is that if movement of patient is feasible, it can be done by air more safely and with greater ease than by any other method. The Scottish Air Ambulance Service was in operation before and during the last World War and now is a responsibility of the National Health Service. In the Canadian West there are excellent Air Ambulance Services run by the government. Now there are solid medical, economic and humanitarian facts to justify the air ambulance.

In peacetime the combined use of the helicopters and the hospital airliners would facilitate medical care in all areas of the nation and bring to everyone the possibility of treatment by specialists. Civil and government facilities would be built and planned for in peace for the loads of war.

Trans Canada Airlines bring many patients to the Institute from the West Indies, Bermuda, Newfoundland and other parts of Canada, and the Canadian Pacific Airlines from Northern Quebec. Transport of the sick and injured in civil aircraft means greater responsibility for the operating crews, provision of special equipment, planning by the medical authorities of the Lines to make sure the patients will stand the journey and not inconvenience other passengers.

Despite the inconveniences and the fact that treatment in transit is difficult, the record of the civilian airlines is a good one. Until such a time as hospital airliners can be provided, we know that the civil airlines will continue their splendid cooperation. Therefore it is the institution of the helicopter ambulance service as a regular one that is our greatest need. We must attempt to work this out with provincial authorities and the Air Force. As for a landing field, we have one at our back door.

REPORT ON HOSPITALIZATION

DR. PRESTON ROBB

It behooves us to stop each year and review the overall hospitalization picture: to consider gains and achievements, and to put the problems that weigh so heavily on us from day to day in their proper perspective. Our major concern has been the ever-rising cost of bedside care, and yet, how can one measure that against the life of just one who has been safely brought through a period of complete paralysis with respirator care, to return to full and useful activity.

Patient Care

In 1955, there were 2,344 patients admitted to the Institute, an increase of 8.5% (199) over the previous year, and an all-time record for the Institute. The total number of hospital days was 44,680, an increase of 13.5% (5314) over 1954. This represents an average occupancy of 85.3%. At times we were operating at over 100% capacity, only accomplished by Miss Flanagan's skillful use of extra beds. With this level of occupancy one cannot expect any further increase in the number of patients cared for unless we can find better means of placing some of the more chronic problems, and reducing the length of hospital stay. The average length of stay has remained fairly constant at 19 days. During the year there were 106 deaths, and the autopsy rate was 82%. This is a very commendable autopsy rate, and points up the good work done by the house staff and those involved. There were 945 surgical procedures, an increase of 14% over the previous year. What do these figures mean? They mean that we have been treating extremely sick patients to the limit of our ability. It has been a team-effort, from Dr. Penfield and Dr. Cone, Miss Flanagan down to our faithful Dominic at the front door, each contributing to give our patients the care and consideration they need.

A word must be said about the classification of patients. There has been a striking increase in the number of semi-private patients, but a corresponding decrease in private patients. The percentage of ward patients has remained about the same, but we have become alarmed over the increasing number of QPCA patients for whom we receive less than one third of the actual cost of their care.

The Out-Patient Clinics continue to be active. In the Neurology Clinics there were 549 new patients seen, and 3481 re-visits. In the Neurosurgery Clinics there were 265 new patients, and 686 re-visits. The total attendance was 4167, an increase of 11.5% over the previous year. It had been hoped that the attendance at these clinics would not increase any more, but this does not seem to be the case. As a result, the load on the house staff, social service and Registrar's office goes up, and staff must be increased.

Records

The quality of the records is a reflection of the quality of the work done in the Institute. The preparation of the record, including the typing of the history, reports, discharge summary and the final classification and indexing of the diagnosis is something of which we have always been proud. This year for the first time we have run into a complication we have never had before, and which we look on with grave concern. We have been unable to get sufficient stenographic help to type out the histories. This is an intolerable situation, and every effort is being made to remedy it. We are indeed indebted to Dr. Graham and Mrs. von Nida and their staff for their loyal "Overtime" support. It is hoped that a method can be devised whereby all of the essential data can be typed and less relevant matter put onto a check sheet. This will reduce the volume of work without affecting the quality of the record.

Professional Care

Reference has already been made to the high cost of nursing care. It must be made clear that a great many of the patients, due to their disabling and serious illnesses, require total nursing care. Averaged out, each patient gets 4.7 hours of nursing care per day. This is expensive, but we make no apology for it. We are proud of the care that patients receive. Nurses come from all over this continent and Europe to learn the nursing techniques of the Institute. There is an outstanding post-graduate course, and leadership continues to be given in new techniques. It should also be pointed out that few patients have their own special nurse. This is possible because of the well-planned visual control from the nursing stations. However, all too frequently we have to provide and pay for special nurses for extremely ill patients, for example those on isolation, in respirators, or under hypothermia treatment. During January and February of this year there was an unprecedented number requiring special care, with the results that costs skyrocketed. As well, during the year, staff nurses wages went up 7%, and the daily rate for relief nurses rose from \$10.00 a day with one meal to \$12.50 a day. Secondly: The Royal Victoria Hospital opened their new cafeteria, and all our staff now pay for their own meals. This meant an adjustment of wages, which caused an increase in the payroll of approximately \$5,000.00 a month. Unfortunately, there was not a commensurate reduction in dietary costs, due to the increased cost of operating the RVH main dietary kitchen. Nursing costs are constantly being reviewed in an effort to keep them at a minimum; at the same time, one fact is constantly kept to the fore. Nursing standards can not, and will not be lowered. **WHAT THEN IS THE SOLUTION?**

An endowment fund must be set up to cover the cost of nursing for special cases. We can then budget for all regular care, and extra funds will be available when we need them. It is not only for nursing that special help is needed;

special funds should be available for Clinical research. Endowed beds where patients can remain at no cost to themselves for clinical investigation. Also, we need a larger clinical relief fund for patients who are not indigent, but who just cannot afford the high cost of hospital care. The present grants received from the Province of Quebec and the City of Montreal are a great help, but they are not big enough.

Social Service

The Social Service Department provides a service, the value of which is impossible to measure. The severe disability in neurological disorders, and the social and family problems related to them go hand in hand. The service may be a simple one, such as finding a place for a mother to live while her child is being investigated, or a complicated and time-consuming one such as helping a family plan, where the father and bread-winner has been permanently struck down with a brain tumour. It is not my place to describe or justify their work; it is an essential part of the treatment. However, some more realistic means must be found to support this work. We hope that some financial help will come from the Women's Auxiliary who have been running such a successful canteen. Although the canteen has been operating only for a short time, the Auxiliary has already been most generous with the profits.

Finance

A year ago, at this time, in view of the increasing deficit, it was necessary to increase the rates. This was done after a great deal of deliberation. A balanced budget was drawn up, based on previous year's experience, and for the first seven months of this fiscal year we were able to stay fairly well within our estimates. Income was up from most sources. Even more than we had planned. However, this was offset by the continuing rise in the cost of nursing, and the increased amount of QPCA work. Throughout the year these figures were watched with grave concern. Then in January and February both figures rose beyond all expectations. A careful analysis was made to try and find out the reason. First, for QPCA patients in the first eight months of the year we received \$32,574.00 less than the amount they would have paid as ward patients. Remember also that the ward patient pays less than it actually costs to look after him. It is not our policy to turn away patients. If they are from Quebec, we accept them regardless of their ability to pay. Every effort is made to make some financial arrangement for indigent patients from outside the province before they arrive. Unfortunately, too large a percentage fall into the "unable to pay" class. Up to March 31st we received \$6.50 a day for QPCA patients, but it costs the Institute \$23.00 per day per patient. It is easy to work out the loss. I am pleased to report that with the aid of our good friends in Quebec, the M.N.I. was again classed as a general hospital, and the rate has been increased to \$7.50 per patient per day. This still leaves a balance of \$16.00 that must come out of the Institute funds. I do not want to labour this point. Dr. Turner and others have already stressed the urgent need to re-evaluate the amount paid to hospitals for indigent patients. With the present tax structure of our country it seems incredible that the generous public should be asked to pay as much as they do for the care of the indigent sick.

The second major factor was the cost of professional care. By December 31st this was \$22,529.00 more than had been budgeted for. Then, with an

unprecedented number of extremely sick patients in January and February, this rose to \$37,758.00, and the over-all deficit for the first nine months of the year was \$43,690.00.

Certain facts must be borne in mind. This year is really only the second year of full-scale operation of the enlarged Institute, and budgeting has not been easy or accurate. There has been a 10% increase in cost per patient per day, which, considering the period of inflation in which we are living, is not so extraordinary. We cannot look for an increase in income from patients. If we are to prevent further deficits we must look for

1. Marked increase in the QPCA rates, or increased grants
2. Endowments to cover the extraordinary amount of professional and nursing care provided, and to further help the patient who is not eligible for QPCA, but whose bill far exceeds his ability to pay.

What of the future? With present standards and increasing costs, we must expect a further deficit.

This report is presented with the knowledge that great work has been done by this Institute. Patients have returned home, who otherwise would have died. Doctors and nurses have gone out all over the world with a richer knowledge of the science of neurology. With these things in mind it is clear that some solution must be found for the financial dilemma.

REPORT OF THE DIRECTOR OF NURSING

MISS EILEEN C. FLANAGAN

We have, I believe, been able to maintain a very satisfactory nursing service during the past year, in spite of the constantly increased demands being made upon it. These demands, I am aware, fall on other departments as well, but nursing which must supply three times the usual number of hours of service in a twenty-four hour period, and cover a seven day week and every holiday, is perhaps the most vulnerable when shortages occur. We require at least 3.8 nurses to fill one place on the staff for the 168 hours of the week.

The Study which we made last year has been used to good advantage in our own staffing, and has been commented on by many Neurosurgical Departments in Canada, the United States and England. We have had many letters from both nurses and neurosurgeons who have trained here, telling us that it has stimulated their hospitals to analyze their own neurological and neurosurgical nursing services, and one interesting finding is that our patient nursing requirement ratio of 4.7 hours per patient in 24 hours is considered by them all to be the minimum necessary.

The newer concepts of medical care, with speedier turnover of patients, the increasing number of new drugs, requiring constant and expert observation of reactions, new mechanical devices, hypothermia treatment, all added to the problem that the patient has to a great extent left "his bed" and moved into the larger area of his room or ward keeps the pressures on the nursing staff at high level.

The large number of very ill and incapacitated patients being cared for has required an increase in our nursing assistant and orderly staff, both to assist with the heavy physical demands and to free the nurses for the skilled treatments.

In 1955 we nursed 200 more patients than in 1954, which required us to cover 15,942 more nursing periods.

There was an increase in the number of private duty nurses over the previous year from 521 to 565 and in the number of nursing periods from 4,335 to 5,585 — this accounts for 1,861 days out of a total of 44,680 patient days, or 4%. The average day worked by each special nurse was 9.9.

We gave Post Graduate teaching to thirty-two nurses from Canada, the United States and England, and undergraduate teaching and experience to fifty-four students from the Royal Victoria Hospital. This adds a considerable load to our graduate nursing staff but we feel it pays excellent dividends. A few Bursaries for post-graduate students are needed, and a moderate endowment for the nursing teaching programme.

Our thanks are given to the Women's Auxiliary for a gift of \$300.00 for furnishings for the nurses residence, and we also want to tell them how much it helps the nursing staff to be able to send relatives of very ill patients who are staying long periods, to the Coffee Shop.

The Graduate Nurses' Society has been very active as usual. From the proceeds of their Sale they sent four children and two adults from our Clinic to Camp; sent many Christmas hampers to the sick and \$100.00 to Dr. Chandy in India for equipment.

We thank, as always, the Social Service Department and the Medical staff for their help in teaching and their moral support in many problems.

SOCIAL SERVICE DEPARTMENT

MISS JOYCE BEATTY

This past year has marked continued growth and development of the Social Service Department. Since the last annual meeting, two new social workers have joined the staff, one to fill a vacancy that existed and the other to fill a newly created position made possible by the Dominion Provincial Grant for the study and treatment of epilepsy.

We have continued to play an active role in the teaching program for graduate and undergraduate nurses and social workers. During the past year we have had two students from the McGill School for Social Work in our department for their field work training. We also had the interesting experience of having a social worker from Venezuela observing in our Department for a week. This worker was sent to Canada by the United Nations Technical Assistance Program to study the social worker's role in Rehabilitation.

It is with gratitude that I acknowledge the funds given to the hospital to be administered by this Department in aiding patients. We are all only too well aware that sickness imposes terrible financial burdens on many people and it is most helpful to ease the burden in certain selected cases by using these

special funds. Time does not permit me to name the individuals and groups which have given money but to them all I say a sincere thank you. In speaking of giving, I should like to express our appreciation to three volunteers, two of whom have helped us in clinic and one who has spent one afternoon a week driving for us.

The more experience we gain in working with seizure patients in clinic the more convinced we become that it is only by the closest cooperation of health and welfare agencies that we are going to make very much progress in handling the many problems faced by this group of patients. With this in mind we are cooperating with the Health Section of the Montreal Council of Social Agencies in setting up a community committee to evaluate resources and make recommendations re the establishment of services.

What do I mean by cooperation of health and welfare agencies? We had a young seizure patient of 25 who had completed grade 9 in school, and then had had to leave because of his seizures. He tried to find employment but without success as his attacks were uncontrolled. He moved to Montreal from the country in his search for employment and attended our seizure clinic. He was without funds or a place to stay. In the next couple of weeks he was completely evaluated medically, received financial assistance from a social agency and was referred to a rehabilitation centre for assessment. He was found to have considerable aptitude and interest in Radio and Television repair work and a scholarship was obtained for him through the Provincial Department of Social Welfare and Youth to study this work. In the meantime his seizures have been brought under control with medication. He has just about finished his course and has been assured of a job on receiving his diploma. This is how community health and welfare agencies can cooperate in helping patients.

In speaking of the Community, however, I must mention as I have so often before, the lack of resources for the chronically ill. Time after time we are faced with the problem of trying to arrange the placement of a patient who has benefitted as much as possible by treatment here but who still needs nursing and medical care. The lack of adequate resources means that the patient must remain here longer than necessary, thereby taking a bed that could be used for the treatment of an acutely ill person. I do not know what the answer is, but I do know that we as a treatment team cannot carry out our aim of restoring the patient to maximum comfort, function, and usefulness unless the resources in the community for the treatment of patients requiring long term care are vastly improved and expanded.

Thus the work of the Social Service Department goes on. The aim in the ensuing year will be to provide good social services so the patients may benefit to the fullest extent from the excellent medical and nursing care in this Institute. The guiding principle is our conviction that "earth's greatest treasure lies in human personality and that service to humanity is the best way of life."

DEPARTMENT OF ANAESTHESIA

DR. R. G. B. GILBERT

A great loss occurred to the Department and to the Institute when Dr. A. F. Pasquet left in December. Dr. Pasquet has been responsible for the organization and present status of this Department. Throughout his stay he has been indefatigable and conscientious in the extreme. His personality endeared him to all. Thus we send with him our best wishes for his future and for the future of his department at Halifax.

From the clinical point of view an endeavour has been made to give satisfactory service and to maintain as high a standard of anaesthesia as possible. All anaesthetics have been given or supervised by a staff anaesthetist. When at all possible the staff anaesthetist with one of the residents visits all patients prior to operation and the subsequent days following the operation. During the ward rounds members of the department have an opportunity of taking part in the handling of the patient under hypothermia, those in respirators and on artificial respiration, and those receiving oxygen therapy.

Throughout the year two residents from the diploma course in anaesthesia at McGill have been attached to the staff. These have received supervised instruction in all types of anaesthesia for neurosurgical intervention and neurological investigation.

Members of the department have given seminars for the diplomats and have run a revision course for the certification examination.

Members of the staff have had the privilege of lecturing to the post-graduate nurses on course concerning anaesthesia and the care of the unconscious patient.

Hypothermia and induced hypotension continue to be evaluated. In the former instance short term hypothermia has been used to cover surgical procedures while long term operation of this technique has been used in non-surgical cases. Much time and investigation with co-relation of the studies of others must be spent before the value, if any, of this type of management can be accurately assessed. Our feeling, has grown, of late, that the benefit of both technique may be gained by seeking moderate hypothermia in association with moderate hypotension thereby avoiding the complications seen by the use of each severally.

It is wished once again to emphasize the importance of these liaisons without which members of the department would be unable to remain acutely familiar with the specialty of anaesthesia as a generality. By so doing numerous advances in the general field are observed and practiced, which lead to modification of our more specialized techniques. Research work demanding greater numbers of patients can be carried out with the more numerous clientele at the Veterans Hospital.

At the Royal Edward, anaesthesia for chest surgery is carried out by members of our department twice weekly. A study of this work is virtually applied respiratory physiology, a good knowledge of which is an essential requirement for the study of the science of anaesthesia.

DEPARTMENT OF RADIOLOGY

DR. DONALD McRAE

The clinical work of the department continued at the usual rate. A total of 8043 examinations were carried out. There were 164 ventriculograms and 712 encephalograms. This points up a progressive decrease in ventriculograms and a progressive increase in encephalograms that has been going on for some years as the value of encephalography in brain tumors has become more apparent. 165 cerebral arteriograms or venograms and 413 opaque myelograms were also carried out.

In the Isotope Laboratory studies of the effect of molecule size on the blood-brain barrier were carried out by Drs. Olszewski and Rozdilsky. Dr. McLennan finished his studies on the uptake of radioactive sodium and potassium in mammalian muscle under various conditions of work and rest.

During the year Dr. W. Heneghan, Dr. F. MacDonald and Dr. S. Haffke, all members of the Diploma Course in Radiology of McGill University, served as Residents in the department. Drs. J. Sylvestre and J. Wyllie of the Universities of Montreal and Toronto studied for periods of 6 months each in the department. Dr. Arnold Berrett of South Africa began a study of the long term effect of thorotrast under a James Picker Foundation Fellowship in Radiological Research. Dr. A. Elliott of Queen's University began a retrospective study of posterior fossa tumors assisted by a James Picker Foundation Grant for Radiological Research. Three other doctors spent shorter periods in the department making a total of ten doctors who received training in neuroradiology in the department during the year.

The weekly colloquia in neuroradiology were continued in close association with the weekly neurosurgical case presentations under the aegis of Department of Graduate Studies and Research. Bi-weekly case presentations were also carried out with the neurologists. The weekly neuroradiological seminar has been expanded to three months and was presented in the early fall.

The nature of our work necessitates close cooperation on the part of the interne and nursing staffs. It was cheerfully given, as usual. It is always a pleasure to acknowledge such help and cooperation.

DEPARTMENT OF NEUROCHEMISTRY

DR. K. A. C. ELLIOTT

DR. HANNA M. PAPIUS

During 1955 the work of the Neurochemistry Laboratory increased by 20% over that of the previous year. Of this work, 48% was done for private and semi-private patients and 52% for public patients. The work of the Ward Laboratory decreased a little. The total number of procedures in the two divisions was 14,966 — 7,364 in Neurochemistry and 7,602 on the wards. Besides these procedures, 2,394 blood samples were taken for analyses here and in other

laboratories and 4,623 liters of irrigation solution were prepared for the operating rooms. Since the turn of the year there has been an extraordinary increase in the work of both the Neurochemistry and the Ward Laboratories. This has finally necessitated increasing the staff.

To our regret Mrs. Lois Bota, who had contributed much to the efficiency of the laboratory, had to leave us. Miss Lydia Maslianikoff now does the work on the 7th floor, most conscientiously. Miss Catherine Dickey serves as reserve technician. We were all pleased to have Miss Joan Baker return to us to do the ward work. She is now ably assisted by Miss Maria Werner.

Dr. Pappius has prepared a new manual, for both laboratories, in which revised directions for all procedures and technician duties are concisely presented. This work involved also careful review of all aspects of the work. The manual should assure reliability and uniformity of the work for years.

Dr. Irving Heller has joined the staff as Assistant Clinical Neurochemist. He now reviews reports and provides the necessary liaison with the other clinical departments.

DONNER LABORATORY OF EXPERIMENTAL NEUROCHEMISTRY

DR. K. A. C. ELLIOTT

DR. HANNA M. PAPIUS

In the past year research has proceeded actively and undisturbed by any major new situations. We are continuously conscious of our appreciation of the establishment of the nucleus of the Department by the Donner Canadian Foundation and of the convenience of the new laboratories. The problem of financing the work of fellows is always time consuming though it has been satisfactorily solved this year. Research has been carried out in these laboratories along two main lines, namely, the study *in vitro* of conditions which affect the structure and metabolism of brain, and the investigation of Factor I, a neuro-inhibitory substance from brain. Facilities of the laboratory have, as usual, been available to fellows working primarily in other departments.

In connection with the first set of problems, Dr. Pappius has shown that rat and human brain tissue can undergo two kinds of swelling. One is a large uptake of fluid which is separated from the normal intra- and inter-cellular spaces and seems to be connected with damage to cell processes. The other is a swelling of the cells and occurs during anoxia and certain other conditions. Swelling is not satisfactorily controllable by colloid materials or steroid hormones. Further studies on electrolytes have shown that brain tissue can preserve potassium under anoxic conditions, provided the process of glycolysis is kept very active, and that a considerable part of brain potassium is in a bound form.

Mr. Michael Rosenfeld has provided confirmation, for brain, of the "sodium pump" theory. He has also shown striking effects of electrolytes on glycolysis. His main work, on the nature of the damage to brain caused by "anaemia", that is anoxia and lack of glucose, has produced surprising and valuable information about glycolysis. The damage to brain tissue caused by "anaemia" can, under certain circumstances, be largely reversed.

The work on Factor I, which had been aided by much appreciated grants from the Banting Foundation for Medical Research and the Ciba Company, has also been greatly helped by financial assistance from Merck and Company, Rahway, New Jersey, and by the enthusiastic cooperation of members of the research and technical staff of Merck & Co. and Merck and Co. Ltd. of Canada.

With Dr. Ernst Florey, a remarkably accurate and rapid method for the bio-assay of the factor has been developed. The substance has been shown to exist in brain in a bound, inactive state from which the active material is readily released. Brain preparations can synthesize the factor rapidly *in vitro*. Drs. Elizabeth and Ernst Florey are surveying the neuroanatomical distribution of the factor and find wide variations in the activity in different parts of the brain. The Florey's spent some weeks of the summer in the Lerner Marine Laboratory, Bahama Islands, and, as a result of studies on marine organisms, they brought back illuminating information concerning the physiological role of Factor I.

We have welcomed Dr. Alva Bazemore who was seconded from Merck & Co., Rahway, to work here as fellow of this Institute. He has brought great skill and experience to the large scale production of brain extracts and to the application of modern methods to the isolation of the Factor I. He has obtained highly active material which may be approaching purity.

Dr. Hugh McLennan completed a penetrating study of the movements of electrolytes in mammalian muscle. He has now left to take up the position of Assistant Professor of Physiology at Dalhousie University where we are sure he will continue to do valuable research.

We are glad to welcome Dr. Irving Heller back as a research fellow in this department. He is studying the metabolism of nerve and white matter of the brain in order to gain information applicable to problems of the neuropathies and demyelinating diseases.

The book "NEUROCHEMISTRY. The Chemical Dynamics of Brain and Nerve" edited by K. A. C. Elliott, I. H. Page and J. H. Quastel, was finally published last spring. It has been favorably received by most reviewers but there is already pressure for a revised edition.

DEPARTMENT OF ELECTROENCEPHALOGRAPHY

HERBERT H. JASPER

PETER GLOOR

There has been a 14 percent increase in the number of examinations carried out by this department during the past year. There were 2,487 electroencephalographic examinations carried out on 2,098 patients, 1,164 of which were patients with epilepsy. Patients with brain tumours, or head injuries were the next most common problems presented for study. In addition, there were 65 cortical electrograms carried out during surgical treatment of epileptic patients.

Only 58 percent of the examinations were done on patients admitted to the Neurological Institute, the rest being referred from outpatient clinics or private offices. With additional staff and some improvement in organization

we are now able to handle more promptly the increasing demands for outpatient examinations.

There has been a definite improvement in our work in electromyography since these examinations were taken over by Dr. Numoto. There were only 75 such examinations carried out, but they are being done at a much higher rate at present. Dr. Numoto is making valuable observations on neuromuscular diseases, and drawing from his extensive experience with this method of diagnosis in Japan. His research activities are directed toward the use of electrophysiological methods for the study of spinal reflexes and neuromuscular activity in patients with lesions of the brain, or suprasegmental motor pathways. This is also a continuation of work begun in Japan.

Electroencephalographic investigative work has included the development of an improved method for taking motion pictures of patients simultaneously with the EEG tracing during epileptic seizures, and a study of the use of chlorpromazine for quieting agitated patients and for the activation of epileptic discharge. Detailed analyses of the clinical findings and results of operation in relation to the EEG in a group of patients with parasagittal epileptogenic lesions has been carried out with the help of Drs. Robert and Micheline Vigouroux of Marseilles, France. EEG Clinical Pathological Conferences, given by Dr. Gordon Mathieson of Aberdeen, Scotland, and Dr. Peter Gloor have been particularly interesting and valuable during the past year.

Weekly EEG Clinical Conferences on epileptic patients conducted with Dr. Penfield, Dr. Rasmussen, Dr. McRae and other members of the Clinical Staff continue to serve a useful purpose in the management of more difficult epileptic patients, and in their selection for surgical treatment. Records of these conferences provide valuable material for research.

DEPARTMENT OF NEUROPHYSIOLOGY

HERBERT H. JASPER

ROBERT MARTIN

The facilities of this department have been fully utilized during the past year in an intensive program of neurophysiological research in addition to large scale reconditioning and rebuilding of much of our electronic equipment. The latter has been carried out more recently with the valuable assistance of Dr. Robert Martin, biophysicist, who has recently joined the staff of this department as Bronfman Fellow in Neurophysiology. In addition to building and assembling his own complicated and precise equipment for microelectrode studies of single nerve and muscle cells under controlled physical and metabolic conditions, Dr. Martin has undertaken the direction of our electronics laboratories where an ever increasing volume of work is being carried out by Mr. Glen Warner and Mr. Richard Hayami, electronic engineers, and more recently with the assistance of Mr. Robert Nagler. In future years Dr. Martin will make a separate report on the work of the new section of Neuro-electronics which is serving all departments of the Institute.

During 1955 there have been 18 Fellows and staff engaged in Neurophysiological investigations in these laboratories: Doane, Feindel, Gauthier, Gloor, Jasper, Larramendi, Lende, Martin, Mathieson, Morrell, Numoto, Orbach, Rasmussen, Rayport, Roberts, Rothballer, Sharpless, and Wada. In addition there were 11 Fellows and staff using the facilities of these laboratories for work being carried out in other departments of the Institute. Accommodation for these 29 workers in carrying out 400 major procedures and over 663 minor operations or experiments has taxed the ingenuity of Miss Roach, our laboratory supervisor, and her assistants. Their expert and willing help is greatly appreciated by Fellows and staff alike.

The variety of studies have ranged from *Microelectrode Analyses of Mechanisms of Epileptic Discharge of the Cortex*, being continued with the aid of a Federal Provincial Grant, to *Studies of the Neurophysiological Mechanisms of Learning*, being carried out in collaboration with Professor Hebb's Department of Experimental Psychology with the aid of a grant from the National Science Foundation of the United States. We have maintained a continued interest in our program of research on the physiological properties and anatomical organization of the rhinencephalon and the centrencephalic integrating system with particular emphasis upon their participation in processes of learning and attention.

Recognition of the work of this department was shown in the participation by Dr. Gloor in a Symposium held in Houston, Texas, by Dr. Morrell in a Symposium held in Marseilles, France, by Dr. Martin in a Symposium held in Seattle, Washington, and by Dr. Jasper in a Symposium held in Paris, France and in Madison, Wisconsin, where invited speakers were present from distant parts of this continent and from abroad.

DEPARTMENT OF NEUROANATOMY AND NEUROLOGICAL PATHOLOGY

DR. JERZY OLSZEWSKI

DR. FRANCIS MCNAUGHTON

The relationship established between this Department and the Pathological Institute, as outlined in last year's Report, has been working very satisfactorily for both Departments.

The undergraduate course in Neuroanatomy was given as usual to the Second Year class during the Fall Term. During the preceding summer months, an undergraduate teaching film on the Physiology of Spinal Reflexes was prepared in collaboration with Professors Burns and Jasper and the Institute photographer, Mr. Charles Hodge. Mr. Nathan Shaner, of Third Year Medicine assisted in this work with the support of a grant from F. W. Horner, Ltd.

An advanced course in Neuropathology was given to the Fellows, as well as bi-monthly clinical-pathological conferences for the Neurological Staff.

During this academic year Mr. M. Vulpé and Dr. Elizabeth Florey completed their studies on experimental allergic encephalitis. Dr. B. Rozdilsky and Dr. Olszewski made a study of the permeability of cerebral blood vessels to iodinated (I^{131}) serum albumen.

Dr. W. Sights carried out work on the cerebral uptake of radioactive P^{32} following status epilepticus in cats. Dr. G. Mathieson and Dr. Olszewski prepared material for a Horsley-Clarke atlas of the cat thalamus, which will be completed during the coming year.

During the late summer of 1955 Dr. Mathieson spent several weeks in Los Angeles at the Department of Anatomy at U.C.L.A. in order to learn the technique of plastic embedding of anatomical specimens which has been developed there. During the year an extensive program of mounting neuroanatomical specimens has been under way with Mr. John Reford in charge of technical work.

We note with great regret the resignation of Dr. Olszewski from McGill University to become a Senior Research Associate of the National Research Council at the new Medical School of the University of Saskatchewan.

TUMOUR REGISTRY

DR. ARTHUR R. ELVIDGE

The main purpose of the Tumour Registry is to obtain general statistical data regarding the tumours which pass through the Montreal Neurological Institute. This is made to conform to the general information recorded in the Royal Victoria Hospital Tumour Registry which is under the direction of Dr. H.S. Morton, and which in turn is based upon similar filing systems in the various major hospitals across Canada. The material recorded includes vital statistics from patients being treated for all types of tumours of the nervous system by various methods, both in the Hospital and in the Out-Patients Department. The work is carried out by Mrs. M. Schultz who is the secretary of the Tumour Registry, and succeeded Mrs. R. Lines who resigned in October 1955.

The immediate principal scientific interest concerns the follow-up material. The Tumour Registry was started in 1950, and follow-up is complete in approximately 90% of all cases from that year. Each case from 1950 has been followed regularly at least once a year. This work is carried out through the cooperation of the Private Offices and the Hospital Clinic, and when necessary by direct correspondence with the referring physician, and as a last resort with the patient.

Fellows have been appointed to assist in the supervision of the Tumour Registry, and have been associated with special research projects, gradually completing the follow-up data as far back as the inauguration of the Neurosurgical Service in 1928.

The astrocytomas have been systematically analysed and followed from the year 1928 until the year 1950. This painstaking work was undertaken largely by Dr. Martinez-Coll of Venezuela and Dr. Laurence F. Levy of London. After considerable labour this work has been accepted for publication. During the last $1\frac{1}{2}$ years Dr. John Roth has worked part time in the Tumour Registry, and has also prepared a follow-up analysis of glioblastoma multiforme. The above series of cases will probably rank among the larger published series of the world.

The Tumour Registry will it is hoped stimulate and aid in tumour research. It will also keep the patient in touch with his physician and surgeon, and help with rehabilitation and further control of treatment. Only by knowing what happens to our patients after treatment will it be possible to determine the efficiency of a type of therapy, and for this reason the Tumour Registry should be worthwhile.

REPORT OF NEUROPHOTOGRAPHY

C. P. HODGE

The Department of Neurophotography has had another very good year. The usual volume of operating-room photography, clinical photography of patients, photography of pathological specimens and photomicrography was carried out as in previous years.

A new 35 mm. photographic setup was installed in the operating theater number one beside the large 8 x 10 camera. It is possible now to take two pictures simultaneously, one in black and white and one in 35 mm. color.

The department assisted in devising a motion picture setup for the EEG Department. With this setup the patient and the EEG record are photographed simultaneously.

The department was also very active in the pathological museum on the sixth floor. The display cabinets are being filled with photographs of interesting cases, each illustrated by several 8 x 10 color transparencies.

During the summer a sound teaching film on the reflex arc was produced under the scientific guidance of Dr. Burns. The script was written and the experiments prepared by Mr. N. Sheiner, a third-year medical student. It is hoped that the field of motion pictures, which has been rather neglected, will find more interest in the future. Particularly needed is the help of somebody on the clinical staff who would like to assist in finishing and cataloguing short clinical strips which at present are collecting dust on shelves in the film editing room.

THE FELLOWS' LIBRARY

DR. DONALD LLOYD-SMITH

Further progress is reported this year in the re-organization of the library and in the addition of many new volumes. The entire inventory of the library has been brought up to date and many books reclassified. Approximately 175 new volumes have been added, some 40 of these representing further gifts of extraordinary historical and academic interest from the library of Dr. Wilder Penfield. The library has been re-organized to bring these and other volumes together in a special Historical Section. Regular direction and supervision of subsidiary units of the library has been continued in the Departments of Neurochemistry, Neuroanatomy and Neuroradiology. The demand for new volumes has indicated the need for an immediate increase in the library budget. Additional storage space is being provided to accommodate the earlier issues of an ever increasing number of journals.

We acknowledge with thanks donations to the library from others including the following: Drs. F. L. McNaughton, K. A. C. Elliott, J. Olszewski, J. G. Greenfield, E. C. Crosby, Miss Mary Roach, and the Post Graduate Board of the Royal Victoria Hospital. Special mention should be made of the generous gift of our former Fellow, Dr. Francis O'Brien, which has been partially used to purchase a recently published Encyclopedia of Neurology.

The library is deeply indebted to Dr. Herbert Jasper and the Journal of Electroencephalography and Clinical Neurophysiology for the donation of subscriptions to twenty journals obtained through exchange arrangements. This constitutes a most important supplement to the library's regular journal subscriptions.

THE MONTREAL NEUROLOGICAL SOCIETY

President DR. THEODORE RASMUSSEN
Vice-President DR. W. F. T. TATLOW
Secretary-Treasurer DR. J. B. R. COSGROVE

Twenty-seven meetings of the Section of Neurology of the Montreal Medical-Chirurgical Society were held weekly from October 5th to May 9th.

In addition to bi-monthly clinical meetings held at Notre Dame Hospital, Hotel Dieu, Montreal General Hospital and Montreal Neurological Institute, there were meetings addressed by distinguished visitors and local colleagues, as well as a Symposium on the Surgical Treatment of Extra-Pyramidal Syndromes and a joint meeting with the Section of Psychiatry and the Canadian Psycho-analytic Association at which Mr. André Lussier, of Paris, France, led a discussion on "Fragments of Analysis of a Boy Born with Congenital Shortness of Arms". The papers read before the Society were as follows:

- DR. SHAFICA KARAGULLA, Montreal Neurological Institute, "Personality Changes in Patients with Temporal Lobe Epilepsy".
- DR. WILDER PENFIELD, Montreal Neurological Institute, "A Glimpse of Neurophysiology in the Soviet Union".
- DR. WILLIAM GERMAN, Yale Medical School, New Haven, Conn. "Intra-Aneurysmal Hemodynamics".
- MISS DIANA BECK, F.R.C.S., Senior Neurosurgeon, The Middlesex Hospital, London, England "Acute Postoperative Compression in the Posterior Fossa".
- DR. J. OLSZEWSKI, Montreal Neurological Institute "Presentation of Interesting Neuro-Pathological Cases."
- PROFESSOR GEORGE STAVRAKY, Department of Physiology, University of Western Ontario "Effects of Convulsant and Anti-Convulsant Agents on Partially Isolated Regions of the Central Nervous System."
- DR. PAUL WEISS, Rockefeller Institute for Medical Research "Prospecting in the Field of Growth and Differentiation."
- DR. EDWARD B. NEUHAUSER, Radiologist in Chief, The Children's Medical Center, Boston, Mass. "Lesions Developing from Accessory Neuroenteric Canals."

DR. BERTRAM SELVERSTONE, New England Center Hospital, Boston, Mass. "Tracer Studies of Neurosurgical Problems."

DR. DAVID C. POSKANZER, Bureau of Epidemiology, State of New York Department of Health, Albany, N.Y. "Viral Diseases of the Central Nervous System."

MR. J. F. GILLINGHAM, F.R.C.S., Royal Infirmary, Edinburgh, Scotland "Observations on the Management of Ruptured Intracranial Aneurysms."

MR. GEORGE ALEXANDER, F.R.C.S., Neurosurgeon, Bristol, England "Observations on the Sturge-Weber Syndrome."

DR. ISRAEL WECHSLER, Professor of Clinical Neurology, College of Physicians and Surgeons, Columbia University "On the Broadening Concepts of Neurology" (Annual Hughlings Jackson Lecture).

The officers elected for the following year are:

President: DR. W. F. T. TATLOW

Vice-President: DR. J. DESROCHERS

Secretary-Treasurer: DR. J. B. R. COSGROVE

THE FELLOWS' SOCIETY

DR. MARK RAYPORT, *President*

DR. PETER GLOOR, *Vice-President*

DR. LEVER STEWART, *Secretary*

The Fellows' Society has had a large membership comprising 53 members from 17 different countries.

The first meeting of the year, held at the home of Dr. Preston Robb, gave an opportunity to introduce the new Fellows and to make plans for the year. The Fellows' Society held two dinners during the year and organized the annual formal dance of the Institute.

In the spring, the first issue of the Fellows' Society Newsletter was sent out to alumni of the Fellows' Society. Its purpose is to provide a closer link among former Fellows and between alumni and present Fellows. Plans were initiated to establish an annual Fellows' Society Lectureship at the Institute.

The scientific program of the Society consisted of a number of informal meetings with visiting scientists, many of whom were guests of the Montreal Neurological Society. The speakers were: Professor J. C. Eccles; Professor A. Brodal; Dr. W. German; the late Diana Beck, F.R.C.S.; Dr. R. Vigouroux; Dr. G. Stavraky; Professor A. M. Monnier; Dr. E. B. D. Neuhauser; Professor J. F. Fulton; Dr. B. Selverstone; Mr. F. J. Gillingham; Mr. G. Alexander; and Professor J. Elkes. The last meeting of the year was held with Dr. W. Penfield who shared his reminiscences of neurosurgeons he has known.

CLINICAL APPOINTMENTS AND FELLOWSHIPS*

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

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

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

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

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

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

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

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

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

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

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

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

COURSES OF INSTRUCTIONS UNDERGRADUATE

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

GRADUATE

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

A. SEMINAR IN 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.
Professors Olszewski and McNaughton

2. Advanced Neuroanatomy for selected group; brain modelling, beginning in January; times 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 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 to 6 p.m.

G. DEMONSTRATIONS IN MEDICAL NEUROPATHOLOGY. ...

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

Professor Olszewski

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. Olszewski.
- (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). Mondays, 4:30 to 6:00 p.m.
2. Colloquium, 1 hour weekly (9 months), Mondays, 9:00 a.m.

Professor McRae.

PUBLICATIONS

1955-56

J. B. R. COSGROVE:

An Evaluation of the Importance of Symptoms, Signs, and Spinal Fluid Findings in the Diagnosis of Polyomyelitis in the Absence of Paralysis. *Canad. M.A.J.* 72: 808-811, 1955.

JAMES CROSSLAND:

Acetylcholine Content of Brain During Insulin Hypoglycemia. *Am. J. Physiol.* 183: 32-34, 1955 (with K. A. C. Elliott and Hanna Pappius).

Acetylcholine Content of Frozen Brain. *Am. J. Physiol.* 183: 27-31, 1955 (with Hanna Pappius and K. A. C. Elliott).

HAROLD ELLIOTT:

Continuous Recording of Respiration, Heart Rate and Systolic Blood Pressure. *Canadian Services Medical Journal*, July-August, 1955 (with D. DeLisle and C. E. James).

K. A. C. ELLIOTT:

Chemical Studies in Relation to Convulsive Conditions. Chapter for book, *Neurochemistry*, by Elliott, K. A. C., Page, I. H., and Quastel, J. H., p. 677-695, Springfield, Ill., Charles C. Thomas, 1955, 900 pp.

The Relation of Ions to Metabolism in Brain. *Canad. J. Biochem. & Physiol.* 33: 466-480, 1955.

Brain Tissue Respiration and Glycolysis. Chapter for book, *Neurochemistry*, by Elliott, K. A. C., Page, I. H. and Quastel, J. H., p. 53-93, Springfield, Ill. Charles C. Thomas, 1955, 900 pp.

See James Crossland, joint author.

ARTHUR ELVIDGE:

The Morphology, Biological Behaviour and Prognosis of Brain Tumours. *Cancer* 5: 192-204, 1955.

Four Years Experience with Pre-Frontal Lobotomy. *Am. J. Psychiat.* 112: 375-381, 1955 (with V. A. Kral).

ERNST FLOREY:

The Release of an Inhibitory Substance from Mammalian Brain and its Effect on Peripheral Synaptic Transmission. *J. Physiol.* 129: 384-392, 1955 (with H. McLennan).

Effects of an Inhibitory Factor (Factor I) from Brain on Central Synaptic Transmission. *J. Physiol.* 130: 446-455, 1955 (with H. McLennan).

Is ATP the Sensory Transmitter Substance? *Naturwissenschaften*, 42: 561-562, 1955 (with H. McLennan).

R. G. B. GILBERT:

Neurological Complications of Spinal Anaesthesia. *Canad. Anaesth. Soc. J.* 2: 116-123, 1955.

Certain Details on Operative Posture. Chapter for book, *Atlas of Musculoskeletal*

- Exposure, edited by H. F. Mosely, p. 124-127, New York, J. B. Lippincott, 1955.
- Anaesthesia and the Burnt Child*. *Canad. M.A.J.* 72: 610, 1955.
- Anaesthesia*. Chapter for book, *Textbook of Surgery*, 2nd Edition, edited by H. F. Mosely, p. 144-168. St. Louis, C. V. Mosby, 1955.
- Anaesthetic Sequelae in the Elderly*. *Canad. M.A.J.* 73: 903, 1955.
- Investigations of New Drugs with Special Reference to Largactil*. *Canad. Anaesth. Soc. J.* 2: 5-13, 1955 (with A. Dobkin and L. Lamoureux).

PIERRE GLOOR:

- Electrophysiological Studies on the Connections of the Amygdaloid Nucleus of the Cat. I. The Neuronal Organization of the Amygdaloid Projection System*. *EEG Clin. Neurophysiol.* 7: 223-242, 1955.
- Electrophysiological Studies on the Connections of the Amygdaloid Nucleus of the Cat. II. The Electrophysiological Properties of the Amygdaloid Projection System*. *EEG Clin. Neurophysiol.* 7: 243-264, 1955.
- Telencephalic Influences Upon the Hypothalamus*. Chapter in book, *Hypothalamic-Hypophysial Interrelationships*. p. 74-113. Springfield, Ill., Charles C. Thomas, 1956.
- See Herbert Jasper, joint author.

JOHN HANBERY:

- Unilateral Exophthalmos Due to Orbitofrontal Cholesterol Granuloma*. *Am. J. Surg.* 89: 1144-1162, 1955 (with M. Rayport).
- See B. Nashold, joint author.

IRVING HELLER:

- The Metabolism of Normal Brain and Human Gliomas in Relation to Cell Type and Density*. *Canad. J. Biochem. & Physiol.* 33: 395-403, 1955 (with K. A. C. Elliott).

D. A. HOWELL:

- Unusual Centrencephalic Seizure Patterns*. *Brain* 78: 199-208, 1955.

JOHN HUNTER:

- See D. H. Ingvar, joint author.

DAVID H. INGVAR:

- Electrical Activity of Isolated Cortex in the Unanaesthetized Cat with Intact Brain Stem*. *Acta Physiol. Scandinav.* 33, 1955.
- Extraneuronal Influence Upon the Electrical Activity of Isolated Cortex Following Stimulation of the Reticular System*. *Acta Physiol. Scandinav.* 33, 1955.
- Reproduction of the 3 per second Spike and Wave EEG Pattern by Subcortical Electrical Stimulation in Cats*. *Acta Physiol. Scandinav.* 33, 1955.
- Influence of Visual Cortex upon Light Impulses in the Brain Stem of the Unanaesthetized Cat*. *Acta Physiol. Scandinav.* 33, 1955 (with J. Hunter).

HERBERT JASPER:

- Effects of Repetitive Stimulation on Specific Thalamocortical Systems*. Chapter for book, *Symposium on the Thalamus*. Proceedings of the Pan-American Neurosurgical Congress, Montevideo, April, 1955.
- Electrical Signs of Epileptic Discharge*. Chapter for book, *Electrochemistry in Biology and Medicine*, T. Shedlovsky, Editor, p. 352-359. New York, John Wiley & Sons, 1955.
- Higher Functions of the Nervous System*. *Ann. Rev. Physiol.* 18: 359-386, 1956 (with P. Gloor and B. Milner).
- See Choh-luh Li, joint author.
- See F. Morrell, joint author.

S. W. LEVY:

The Exteratic and Chylolytic Properties of Post-Heparin Plasma and Their Role in Lipaemia Clearing. J. Physiol. 127: 297-317, 1955 (with R. L. Swank).

CHOH-LUH LI:

Laminar Microelectric Studies of Specific Somatosensory Cortical Potentials. J. Neurophysiol. 19: 111-130, 1956 (with C. Cullen and H. Jasper).

Laminar Microelectrode Analysis of Cortical Unspecific Recruiting Responses and Spontaneous Rhythms. J. Neurophysiol. 19: 131-143, 1956 (with C. Cullen and H. Jasper).

BRENDA MILNER:

Intellectual Function of the Temporal Lobes. Psychol. Bull. 51: 42-62, 1954.

The Effect of Hippocampal Lesions on Recent Memory. Tr. Am. Neurol. A., June, 1955 (with W. Penfield).

See H. Jasper, joint author.

FRANK MORRELL:

Electrographic Studies of the Formation of Temporary Connections in the Brain. EEG Clin. Neurophysiol. 8: 201-215, 1956 (with H. Jasper).

Effect of Focal Epileptogenic Lesions and Their Ablation upon Conditioned Electrical Responses of the Brain in the Monkey. EEG Clin. Neurophysiol. 8: 217-236, 1956 (with L. Roberts and H. Jasper).

See A. Ortiz-Galvan, joint author.

HUGH MCLENNAN:

The Inorganic Composition of the Blood and Eggs of a Fresh-Water Crustacean (Cambarus Virilis). Ztschr. f. vergleichende Physiol. 37: 490-495, 1955.

See Ernst Florey, joint author.

FRANCIS MCNAUGHTON:

The Treatment of Trigeminal Neuralgia. J. Chronic Dis. Vol. 3, 1956.

J. NAIMAN:

Agenesis of the Corpus Callosum. Arch. Neurol. & Psychiat. 74: 182-185, 1955 (with F. C. Fraser).

B. S. NASHOLD:

Observations on the Diffuse Thalamic Projections. EEG Clin. Neurophysiol. 7: 609-620, 1955 (with J. Hanbery and J. Olszewski).

JERZY OLSZEWSKI:

Respiratory Responses Evoked by Electrical Stimulation of Pons and Mesencephalon. J. Neurophysiol. 18: 276-287, 1955 (with D. W. Baxter).

Cleft Lip Associated with Cerebrum Impair. Am. J. Surg. 90: 962-964, 1955 (with H. Baxter).

A. ORTIZ-GALVAN:

The Effects of Hydrocortisone on the Healing of Wounds of the Brain. An Experimental Study on the Cat. Arch. Neurol. & Psychiat. 74: 407-413, 1955; Proc. Roy. Coll. Physicians & Surgeons of Canada, 1955.

Effect of Topical Hydrocortisone on the Electroencephalogram of the Cat. Arch. Neurol. & Psychiat. 75: 245-250, 1956 (with F. Morrell).

HANNA PAPPIUS:

See James Crossland, joint author.

WILDER PENFIELD:

The Permanent Record of the Stream of Consciousness. Proc. 14th Internat. Cong. Psychol., June, 1954.

The Role of the Temporal Cortex in Certain Psychological Phenomena. J. Ment. Sc. 101: 451-465, 1955.

A glimpse of Neurophysiology in the Soviet Union. Canad. M.A.J. 73: 891-899, 1955.

Epileptogenic Lesions. Colloque sur les Problèmes d'Anatomie Normale et Pathologique Posés par les Décharges Epileptiques, p. 75-88, Marseille, November, 1954. Les Editions Acta Medica Belgica, Brussels, 1956.

The Insula: Further Observations on its Function. Brain 78: 445-470, 1955 (with M. Faulk).

Results of Surgical Therapy for Focal Epileptic Seizures. Canad. M.A.J. 73: 515-531, 1955 (with K. Paine).

The Syndrome of Apractognosia due to Lesions of the Minor Cerebral Hemisphere. Arch. Neurol. & Psychiat. 75: 400-434, 1956 (with H. Hécaen, C. Bertrand, and R. Malmö).

See B. Milner, joint author.

THEODORE RASMUSSEN:

Chronic Midline Cervical Disc Protrusions; Observations on Diagnosis and Results of Surgical Therapy. Neurology 5: 494-509, 1955 (with E. Yuhl, D. E. Hanna, and R. B. Richter).

Tissue Effects Surrounding Beta Ray Point Sources. Fed. Proc. 14: 406, 1955 (with P. V. Harper, A. Y. Gerol, T. Kennedy, and K. A. Lathrop).

Tissue Radiation Effects Surrounding Y90 Impregnated Gelfoam. Fed. Proc. 14: 409, 1955 (with T. Kennedy, P. V. Harper, and K. A. Lathrop).

Destruction of Pituitary Gland in Metastatic Cancer with Yttrium 90 Pellets. Semi-annual Report to the Atomic Energy Commission by the Argonne Cancer Research Hospital.

search Hospital p. 1-16, March, 1955 (with P. V. Harper, E. Yuhl, and O. M.

Effects of Radiation in Tissue Surrounding Y90 — Impregnated Gelfoam. Semi-annual Report to the Atomic Energy Commission by the Argonne Cancer Research Hospital, p. 1-16, March, 1955 (with T. Kennedy, P. V. Harper, and K. A. Lathrop).

MARK RAYPORT:

See John Hanbery, joint author.

PRESTON ROBB:

Neurologic Complications of Pregnancy. Neurology 5: 679-690, 1955.

LAMAR ROBERTS:

See F. Morrell, joint author.

ALAN ROTHBALLER:

Transtemporal Pituitary Stalk Section in the Dog. Ann. Surg. 143: 422-429, 1956 (with S. Skoryna).

W. F. T. TATLOW:

Phantom Limbs. Canad. M.A.J. 73: 170, 1955.

DONATIONS

TO CLINICAL RELIEF FUND:

Miss Suzanne Cohen	\$	30.00
Miss Lya Gaspar		100.00
McColl Frontenac Oil Co.		500.00
Mrs. J. Clare Wilcox		100.00

TO CANCER CLINICAL RELIEF FUND:

Cancer Aid League		1,227.00
Cancer Aid League		1,000.00

TO MISCELLANEOUS SPECIAL FUNDS:

Quebec North Shore Paper Co.		1,000.00
Mrs. Virginia Coleman		5,000.00
Mr. Harold Brown		500.00
Dr. James Burrowes		300.00
Mr. Harris Appel		500.00

TO EVELINE ROBINS MEMORIAL RESEARCH FUND:

Dr. Geo. Robins		5,000.00
-----------------------	--	----------

TO CONE RESEARCH FUND:

Mrs. Mollie Strauss		150.00
Mr. S. Reitman		100.00
Mr. & Mrs. Josef Aron		50.00
Col. E. B. Jenckes		50.00
Mr. Harold Crabtree		1,000.00

CLASSIFICATION OF DISEASES

Nervous System Generally:

Neurosyphilis	12
Multiple sclerosis	91
Motor neurone disease	5

Meninges:

Meningocele and Myelomeningocele	27
Acute purulent meningitis	20
Tuberculous meningitis	6
Headache	43
Subdural haematoma	16
Subdural hygroma	4
Epidural haematoma	2
Subarachnoid haemorrhage	18
Miscellaneous	9

Brain:

Congenital anomalies	2
Hydrocephalus	18
Brain abscess	1
Cerebral concussion	69
Cerebral contusion, laceration, traumatic encephalopathy	41
Epilepsy	424
Migraine	35
Parkinsonism	10
Cerebral thrombosis, encephalopathy due to arteriosclerosis	107
Cerebral haemorrhage	11
Cerebral embolism	2
Intracranial aneurysm	26
Encephalitis	8
Miscellaneous	60

Tumours:

Glioma	77
Perineurial fibroblastoma	13
Meningeal fibroblastoma	22
Pituitary adenoma	17
Craniopharyngioma	11
Ependymoma	6
Angiomata	13
Miscellaneous CNS and skull	42
Secondary tumour, brain and spinal cord	35
Miscellaneous tumours, body generally	24

Spinal Cord:

Compression of the spinal cord	13
Acute myelitis	1
Guillain Barré syndrome	13
Myelopathy, undetermined origin	20
Syringomyelia	10
Miscellaneous	12

Cranial and Peripheral Nerves:

Optic neuritis	3
Trigeminal neuralgia	49
Bell's palsy	3
Menière's syndrome	9
Cervical rib syndrome	2
Traumatic peripheral nerve lesions	19
Other neuralgias	9
Peripheral neuropathy	14
Miscellaneous	25

Muscles:

Myasthenia gravis	4
Miscellaneous	12

Mental Diseases:

Mental deficiency	9
Schizophrenia	7
Depression	6
Drug addiction	6
Psychoneurosis	69
Organic psychosis	5

Other Systems:

Occipitalization of atlas	2
Congenital anomalies of spine	2
Congenital anomalies of skull	5
Herniation of intervertebral disc, cervical	49
thoracic	5
lumbar	237
Fracture and/or dislocation of vertebral column	27
Fracture, skull	107
Back pain	69
Intractable pain	4
Face pain	3
Miscellaneous traumatic lesions and infections	27
Arthritis of spine	14
Miscellaneous and undiagnosed	118

CLASSIFICATION OF OPERATIONS

Craniotomy (ostoplastic, miscellaneous, etc.)

Hemispherectomy	3
and Biopsy	4
and Decompression	4
and Drainage of Abscess	2
and Drainage of Subdural Hematoma	19
and Drainage of Intracerebral Hematoma	7
and Drainage of Extradural Hematoma	2
and Excision of Epileptogenic focus	17
and Exploration	5
and Hypophysectomy	8
and Incision and Drainage of Cyst	6
and Obliteration of Aneurysm	11
and Obliteration of Cyst	2
and Plastic Repair of Dura	3
and Removal of Adhesions	1
and Removal of Tumour	107

and Rhizotomy	12
and Sinusectomy	1
and Lobectomy	39
Trepanations or Craniocentesis	5
and Biopsy	8
and Drainage of Subdural Space	11
and Placement of Electrodes	1
and Ventriculography	14
and Exploration	3
Elevation of Depressed Skull Fracture	34
Plastic Repair of Skull defect, Tantalum	2
Plastic Repair of Skull defect, Bone	2
Suture of Lacerated Wound of Scalp	3
Ventriculocisternostomy (Torkildsen's)	4
Morcellation of Skull	3
Laminectomy or Hemilaminectomy	
and Anterolateral Chordotomy	7
and Decompression of Spinal Cord	4
and Exploration	11
and Incision and Drainage Intramedullar Cyst	5
and Incision and Drainage of Abscess	1
and Removal of Tumour	15
and Rhizotomy	6
and Spinal Fusion with Bone Graft	13
and Spinal Fusion with No. 18 Wire	7
and Discoidectomy	155
and Cervical Discoidectomy	15
and Cervical Occipital Fusion	3
Anterospinal Rhizotomy	2
Sympathetic Ganglioneurectomy	2
Plastic Repair of Cranium Bifidum	4
Plastic Repair of Spina Bifida	13
Incision of Scalp and Application of Tongs	1
Ligation of Artery	13
Exploration of Nerve	2
Ligation of artery with Selverstone clamp	4
Neurectomy	7
Nerve Suture	10
Re-opening of Wound with Evacuation	1
Re-opening of Wound, with Exploration	6
Re-opening of Wound with Removal of Bone Flap	4
Re-opening of Tantalum Plate	2
Re-opening of Wound and Repacking	2
Re-opening of Wound with Drainage of Infection	3
Resuturing of Wound	1
Miscellaneous	65
Plaster Cast	61
Ventriculo-Peritoneal Shunt	24
Cerebral Arteriography	112
Tic Injection	13
Nerve Blocks	9
TOTAL	945

ITEMS OF INTEREST

"Fellows come and Fellows go at the M.N.I."

Dr. Alexander de Willebois will be returning to Holland after a year on the Wards. Dr. Maurice Héon will be leaving to enter private practice in Neurosurgery in Quebec City. Dr. Theodore Hoff will be going to Winston-Salem, North Carolina, to complete his training. Dr. Jagdis Siddoo is preparing to go to India later this year. Dr. Armando Ortiz will be starting practice in Mexico. Dr. Allan Rothballer will have completed his training after a busy five years and is leaving for the Albert Einstein Medical School. Dr. Arnold Berrett will be returning to South Africa after putting the finishing touches to his training in Radiology. Dr. Ernst Florey and Dr. Elizabeth Florey will be leaving for the University of Washington in Seattle where Dr. Ernst will be assistant Professor of Zoology. Dr. Bohan Rozdilsky and Mr. Michael Vulpé are leaving for Saskatoon where they will work with Dr. Jerzy Olszewski. Dr. Olszewski has recently been appointed a senior research associate of the National Research Council of Canada, and will head the section of Neuropathology at the University of Saskatchewan Medical School. They will be joining former fellows Dr. William Feindel, Dr. Joseph Stratford and Dr. Sidney Traub. Dr. Alva Bazemore will be returning to the research unit of Merck & Co. in Rahway, New Jersey. Dr. Lever Stewart will be leaving later in the year for a year at Queen Square, London. Dr. John Roth is leaving for a tour with the United States Air Force. He will be doing some neurophysiological research and some neurosurgery at Dayton, Ohio. Dr. Claude Gauthier is leaving to join the staff of Notre Dame Hospital, Montreal. Dr. Gordon Mathieson is returning to Aberdeen, Scotland, where he has an appointment as lecturer in pathology.

Each Fellow has left something at the Institute for which we are grateful. To all we wish God speed and every success.

During the past five years, Mr. Donald Bain has been our business manager and building administrator. It is with mixed feelings that we report his departure: a feeling of sadness on his leaving and happiness for him in his new position as chief accountant of McGill University. A well-earned promotion. We congratulate him.

Mr. Hodge has been elected chairman of the St. Lawrence Valley Chapter of the Biological Photographic Association.

In February, Dr. Wilder Penfield delivered the Louis Clark Vanuxen Lectures at Princeton University. During the year he also made a flying trip to Russia where he delivered a series of lectures. In the early Spring, Dr. and Mrs. Penfield made an extensive tour of the Eastern Mediterranean where Dr. Penfield continued his studies of Hippocrates.

We are happy to report the marriage of Miss Jean Harris, chief technician of the X-ray Department to Dr. Warren Sights, one of our Fellows; also to report the marriage of Miss Margaret Haggart, operating room supervisor, to Dr. Wilfred Blair of Oshawa, Ontario. To both couples we extend our best wishes.

Through the cooperation of the R.C.A.F. and the enthusiasm of Dr. William Cone, more and more patients are being flown to the Institute by helicopter. As well, the United States Air Force has flown patients to and from the Institute.

Dr. Cone continues to provide leadership in all phases of patient care. His friends will be pleased to hear that he continues to be well and as busy as ever.

During the year, Dr. Arthur Young has been ill; but is well again and everyone is happy to see him about the Institute.

Dr. Arthur Elvidge continues his annual world tours. It is always a mystery where he will go, but everyone enjoys his illustrated travelogues on his return.

Returning Fellows will be interested in the new Coffee Shop on the first floor opposite the Amphitheatre operated by the Ladies Auxiliary; it has been a great success.

The Fellows' wives society continues to play an active role in the life of the Institute. Last year the officers were: Mrs. Louise Bertrand, President; Mrs. Sylvia Branch, Vice-President; Mrs. Alison Cosgrove, Secretary; Mrs. Irma Stewart, Treasurer.

